EUROPEAN JOURNAL OF PHYSICAL AND REHABILITATION MEDICINE

MEDITERRANEAN JOURNAL OF PHYSICAL AND REHABILITATION MEDICINE

formerly

EUROPA MEDICOPHYSICA

Chief Editor: Stefano NEGRINI

VOLUME 52 - SUPPL. 1 No. 2 - APRIL 2016

Official Journal of

Italian Society of Physical and Rehabilitation Medicine (SIMFER)

European Society of Physical Medicine and Rehabilitation (ESPRM)

European Union of Medical Specialists - Physical and Rehabilitation Medicine Section (UEMS - PRM)

Mediterranean Forum of Physical and Rehabilitation Medicine (MFPRM)

Hellenic Society of Physical and Rehabilitation Medicine (EEFIAP)

In association with

International Society of Physical and Rehabilitation Medicine (ISPRM)

20th European Congress of PHYSICAL and REHABILITATION MEDICINE

Estoril - Lisbon

23-28 April 2016

EDIZIONI MINERVA MEDICA

PUBBLICAZIONE PERIODICA BIMESTRALE - POSTE ITALIANE S.P.A. - SPED. IN A.P.D.L. 353/2003 (CONV. IN L. 27/02/2004 N° 46) ART. 1, COMMA 1, DCB/CN - ISSN 1973-9087 TAXE PERÇUE

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This journal is *PEER REVIEWED* and is indexed by: CINAHL, Current Contents/Clinical Medicine, EMBASE, PubMed/MEDLINE, Science Citation Index Expanded (SciSearch), Scopus

Impact Factor: 1,903

Published by Edizioni Minerva Medica - Corso Bramante 83-85 - 10126 Torino (Italy) - Tel. +39 011 678282 - Fax +39 011 674502 - Web Site: www.minervamedica.it
Editorial office: ejprm@minervamedica.it - Subscriptions: subscriptions.dept@minervamedica.it - Advertising: journals3.dept@minervamedica.it

Chief Editor address: S. Negrini - University of Brescia - Viale Europa 11 - 25123 Brescia, Italy - IRCCS Don Gnocchi Milan, Via Capecelatro 66, 20141 Milan, Italy.
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formerly EUROPA MEDICOPHYSICA

Vol. 52 April 2016 Suppl. 1 to No. 2

20th European Congress of PHYSICAL and REHABILITATION MEDICINE

Estoril - Lisbon 23-28 April 2016

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SPEAKERS PRESENTATIONS

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SUPPORT FOR STUDENTS WITH DISABILITIES IN PORTUGUESE HIGHER EDUCATION: THE GTAEDES WORKGROUP

Aguardenteiro Pires Lilia[1], Martins Gracinda[2]

[1] University of Lisbon, Faculdade de Letras, Núcleo de Apoio ao Aluno, Alameda da Universidade, Lisbon, Portugal
[2] University of Aveiro

Officially formed in June 2004, the workgroup of disability services of Portuguese Higher Education Institutions (GTAEDES) «Grupo de Trabalho para o Apoio a Estudantes com Deficiências no Ensino Superior» (GTAEDES), is composed by public Higher Education Institutions (HEI) that offer services to support students with disabilities. The objective is to provide a quality service to these students and to promote and facilitate the exchange of experiences, the development of initiatives and the rationalization of resources.
With this communication, we aim to present some data about the way that the HEI have been organizing themselves over the past 10 years in order to answer these students' needs. We found that, over the last years, the number of students with disabilities in Portuguese Higher Education has increased and that the HEI are responding to this challenge by increasing the number of Disability Support Services as well as developing specific internal legislation, in particular the public HEI.
Keywords: Higher Education; students with disabilities; inclusion

PHYSICAL THERAPY MODALITIES AND REHABILITATION TECHNIQUES IN THE MANAGEMENT OF NEUROPATHIC PAIN

Akyuz Gulseren

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Marmara University School of Medicine
Istanbul, Turkey

Neuropathic pain (NP) has a complex, severe and persistent character with varying intensity and duration changes and it is usually unresponsive to treatment. NP can accompany to many diseases and can also be related with an injury. NP syndromes according to anatomical involvement can be divided into three groups: Peripheral nervous system, central nervous system and mixed). Pharmacological and non-pharmacological treatment options have been used extensively. First-line medication choice in NP includes tricyclic antidepressants (TCAs), serotonin-norepinephrine reuptake inhibitors (SNRIs), anticonvulsants, opioids, cannabinoids and topical agents. Physical therapy modalities such as superficial and deep heat applications, traction, laser, transcutaneous electrical nerve stimulation (TENS), diadynamic and interferential electrical currents are more helpful when combined with therapeutic exercises. Psychotherapy, cognitive behavioral therapy (CBT) and relaxation therapy are recommended in the management of NP. Non-invasive (repetitive transcranial magnetic stimulation (rTMS) and transcranial direct current stimulation (tDCS)) and invasive neuromodulation techniques (deep brain stimulation (DBS), motor cortex stimulation (MCS), and spinal cord stimulation (SCS)) are also focused on the treatment of NP. These neurostimulation techniques promise hope for the future of NP treatment.

CANCER PAIN AND REHABILITATION

Akyuz Gulseren

Dept of PM&R and Division of Pain Medicine
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Istanbul, Turkey

Cancer is a group of diseases characterized by uncontrolled growth and spread of abnormal cells, which can result in death. Cancer is caused by both external factors (eg, chemicals, radiation, viruses) and internal factors (eg, hormones, immune conditions, inherited mutations). Today, cancer is treated with surgery, radiation, chemotherapy, hormones, immunotherapy, and rehabilitation.
Cancer rehabilitation is a process to restore physical and/or mental, psychological abilities due to the disease or its complications, and side effects of therapies in order to function in a normal or near normal way. In cancer rehabilitation there are four stages: a) Preventive; b) Restorative; c) Supportive; and d) Palliative. The goals of cancer pain management and rehabilitation are to decrease pain, stabilize general health status, minimize dysfunction, and improve quality of life. Pain in cancer patients can be cancer-related 70%; treatment-related 15%; or non-related with cancer and treatment 15%. Management of cancer pain aims to develop helpful strategies to eliminate pain; to prevent disability; to help patients get back to daily living activities. Treatment protocol should be individualized depending on the needs of patient. Education increases patient compliance to cancer pain management.

RESPIRATORY REHABILITATION IN PULMONARY CANCER

Almeida Paula

Dept. Physical Medicine and Rehabilitation
Hospital Pedro Hispano
Matosinhos, Portugal

Pulmonary Rehabilitation reduce symptoms, improve quality of life and increase physical and emotional participation in everyday activities in COPD. Benefits of Pulmonary Rehabilitation are high level evidence based. Benefits also apply to other pulmonary chronic diseases including cancer.

DO PHYSICAL THERAPIES HAVE A ROLE IN THE PAIN TREATMENT IN SCI?

Antunes Filipe

MFR/Unidade de Dor Crónica do Hospital de Braga
Hospital de Braga
Braga, Portugal

SCI is a major issue in PRM field. Pain after SCI is the most important handicap in these patients and a special challenge to overcome.
Physical therapies are an alternative and complementary approach in pain clinic and a valid option in a multi-modal therapy, besides its limited evidence results. Exercise in its different modalities is the core issue of PRM action. Other possibilities are physical agents, mainly electrical stimulation.
We will discuss the role of PRM in helping people with pain after SCI, in order to understand actual and future possibilities.

ULTRASOUND GUIDED INTERVENTIONAL PROCEDURES FOR BACK PAIN

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Landmark-based techniques, fluoroscopy and computer tomography have predominantly been used to guide interventional procedures in lumbar pain management. Recently, there has been considerable interest in the use of ultrasound for procedures involving the lumbar spine.
It is well documented that imaging guided techniques are superior to blind ones, as it concerns accuracy and outcomes. Ultrasound guidance presents certain advantages in comparison with other techniques, including the avoidance of radiation exposure, increased mobility, lower equipment expenses; it allows real-time imaging and soft tissue, nerve, and blood vessel visualization. The ultrasound guided techniques present limitations as well, mainly related to the body habitus and the depth of the target tissue.
In order to start practicing US guided lumbar spine procedures it is important to become familiar with the lumbosacral sonographic views first.
The aim of this lecture is to present the most commonly used sonographic views and to familiarize the audience with the following techniques, performed under ultrasound guidance:

1. medial branch blocks
2. facet joint injections
3. pararadicular injections
4. neuraxial procedures
5. muscle injections
6. sacroiliac joint injections

MUSCLE STRENGHT AND FUNCTIONAL OUTCOMES

Beckert Paulo

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Reduction in skeletal muscle strength after injuries to the musculoskeletal system depend of several factors. Sports injuries should result in skeletal muscle hypotrophy and weakness, decrease of aerobic capacity and fatigability. These negative effects can be expanded with immobilization.
Programs of sports rehabilitation after injuries include several components including joint and soft tissue mobility, endurance, flexibility, balance, proprioception, strength, speed and power. These programs follow a logical sequence to restore these components and promote an optimal functional outcome and peak performance.
Restoration of strength is one of the most relevant and vital aspects of a rehabilitation program. Designing optimal resistance training programs in a rehabilitation process in order to maximize training adaptations is a challenge for all involved in rehabilitation of injured athletes.
The training variables must be manipulated in own way to elicit muscular and neural adaptation in order to maximize adaptations..
For maximal strength gains occur it is necessary an appropriate method of training. Periodization (planned manipulations of training variables, ie, load, set and repetitions) is one way to approach the design of strength training programs and to meet established goals and get an optimal functional outcome.

RECOVERY AFTER BRAIN INJURY: A MATTER OF LESION, BRAIN AND ENVIRONMENT

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Major gaps in knowledge on the recovery process after acquired brain injury concern different responses to similar injuries, and similar outcomes after different injuries. The pre-morbid individual factors and environmental factors that may play a role in determining such differences are described, and perspectives for future research are proposed. Among the individual factors which could influence the outcome, demographic (e.g. age, gender), social (e.g. education), and biological characteristics have been studied. Environmental factors have been less extensively investigated. The systematic collection of data, for example through population based registries, may be helpful in elucidating the relationships among these factors.

HOME-AND COMMUNITY-BASED REHABILITATION IN CHRONIC DISABLING CONDITIONS: CONCEPTUAL FRAMEWORK(S) AND PRACTICAL ISSUES

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Chronic disabling conditions (CDC) can be seen as a distinct health category, and represent a major health and social issue in most of the countries. Comorbidity/multimorbidity, individual and environmental factors often interact in these conditions, determining limitations of functioning and participations with different levels of severity and complexity. Several models of care have been proposed to address these issues; the ICF model is much helpful in elucidating the relationships among the different factors impacting on functioning in persons with CDC. Home and community care and rehabilitation may play a crucial role in the management of these conditions, and require theoretical frameworks which are quite different from those used in the hospital settings. Such aspects are illustrated and their practical implications are described, with specific reference to the capacity-performance distinction.

STATE OF THE ART IN ASSESSMENT AND TREATMENT OF SUBJECTS WITH POST-POLIO SYNDROME

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Rehabilitation of patients with prior polio is mainly based on physiotherapy. Patients with full or almost full strength may perform physical training without restrictions. Patients with a critical degree of muscle weakness should be advised to perform endurance training and patients with a severe muscle weakness shall be treated by a physiotherapeutic approach in order to avoid muscle contractures. The finding of an inflammatory reaction in post-polio patients may open for new treatment strategies.

ETHICAL ISSUES IN REHABILITATION OF PERSONS AFTER AMPUTATION

Burger Helena

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Amputation is surgery to remove all or part of an upper or lower limb and is already an ethical issue. Due to Australian and Dutch guidelines for rehabilitation of people after amputation, surgeon has to consult PRM team and patients before surgery. After surgery there are many other ethical issues, such as whether to fit a prosthesis or not, when to fit it (specially in patients with wounds), which prosthetic components to use, recommendations for return to work, driving, prevention of secondary impairments and overuse problems. For modern prosthetic components that are collecting information about use of prosthesis it is also issues whose are these data. The evidence for some of them will be presented.

COMPREHENSIVE REHABILITATION AFTER UPPER LIMB AMPUTATION

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The human hands are a very complex part of the body with many different motor and sensory functions. After amputation, all functions of the human hand are lost. Consequently person has problems with many activities and participation. To be successful the rehabilitation has to focus on all levels of human functioning, has to start immediately after injury and has to include all team members.
One possibility that we have is also fitting person with prostheses. In the last decade there has been a huge development in the field of upper limb prosthetic components. At the moment there is still lack of evidence which prosthetic components are the best for individual person.
The lecture will present the state of the art of the rehabilitation programme and upper limb prosthesis.

PAIN AND SPASTICITY IN SCI. WHO COMES FIRST?

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Pain and spasticity are frequently associated not only with spinal cord injuries (SCI) patients but also in many neurological conditions such as Multiple Sclerosis (MS) and spastic hemiplegia (SE). In all these conditions pain can have a negative impact on the rehabilitation outcome influencing different clinical aspects including the degree of spasticity. Moreover, the clinical picture can be even more complex by an inverse relationship between spasticity and pain since spasticity can be painful and therefore, being able to trigger a vicious circle spasticity-pain-spasticity.

Pain and spasticity can be both generated by the same lesion of the spinal cord. In this case, spasticity and pain are of neuropathic origin. In other cases, pain has different generators for instance in joints and muscles and therefore pain has a nociceptive origin while spasticity has a different and neuropathic origin. In SCI, some nociceptive pain conditions can be also pre-existing to the neurological lesions while others are a consequence of the neurological lesion and frequently related to the degree and extent of spasticity.

Moreover, regardless from nociceptive or neuropathic origin pain and spasticity can be felt in the same or in different anatomical parts. In SCI pain can be therefore felt in anatomical districts above the lesion, below the lesion or felt in the dermatomal distribution of the injured spinal cord segment.

In the clinical battlefield all these combinations, nociceptive and neuropathic, same or different anatomical districts, can be associated and made the rehabilitation approach even more complicated.

Thus, in SCI patients (as well as in MS and hemiplegia) with spasticity and pain, the pivotal issue to choose the proper rehabilitation and pharmacological approach is to disentangle the physiopathology of the painful condition.

Is the pain primarily of neuropathic origin (i.e. generated by the same neurological lesion) or is the painful condition of nociceptive origin and, in this case, is it secondary, following the primitive neurological lesion or disease, or is it a non-related pain condition. All these combinations deserve different approaches in pain and spasticity in SCI. Who comes first?

ACTION OBSERVATION AS A TOOL FOR UPPER LIMB RECOVERY

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Background: Action observation (AO) can be defined as a dynamic state during which the observer can understand what the other is doing by simulating the actions and outcomes that are likely to follow from the observed motor act. Its clinical impact on upper limb functional recovery in sub-acute stroke patients has been addressed in a few studies.
Methods: In order to explore the differential role of the AO in right versus left hemisphere-damaged stroke patients, a randomized controlled trial has been performed. The study included 67 patients with ischemic lesions purely, who underwent intensive rehabilitation in an inpatient setting, with the addition of 15-minute daily sessions of either experimental (EG) or control treatment (CG), twice per day. EG group was asked to carefully watch footages showing 20 different daily routine tasks (actions) carried out with the upper limb, and then imitate the task, across 20 daily sessions, for 4 consecutive weeks. At the beginning (T0), and at the end of the treatment (T1), and at 6 months from treatment conclusion (T2), the Fugl-Meyer Test (FM) and Box and Block Test (BBT) scores were measured.
Results: While all subjects showed a significant improvement in arm function after either treatment, those with left hemiparesis exhibited a significantly greater improvement when treated with the AO protocol, than with standard treatment. Conversely, right hemiparetic subjects showed a similar upper limb function improvement independent of group allocation.
Conclusion: Action observation can stimulate and enhance the beneficial effects of motor training on motor memory formation, especially in left hemiparetic patients following an acute ischemic stroke. Future trials on larger samples are warranted, exploiting this add-on therapy through the assistance of tele-rehabilitation.

INNOVATIVE TECHNIQUES AND REHABILITATION IN PARKINSON'S DISEASE

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Innovative technologies for rehabilitation of people with Parkinson's disease (PD) have dramatically increased these past 20 years. An overview of available tools and their current level of validation will be presented. Robotic rehabilitation has yielded various results in the literature. It seems to have some effect on functional capacities when used for gait training, even if greater information is needed on its specific indications in PD patients with or without freezing of gait, as well as in different disease phases. Action observation treatment is being widely used in the rehabilitation of motor impairments, with some admitted benefits for gait improvement; further data is needed to understand its supporting role in upper limb training. Non-invasive brain stimulation (rTMS and TDCS) are promising since research studies on very small samples have determined the different benefits of either frontal or parietal cortex stimulation on motor performances; however clinical evidence of their effectiveness is still lacking

Technological devices applied to rehabilitation are revolutionizing our clinical practices. Most of them are based on advances in neurosciences allowing us to better understand the phenomenon of brain plasticity, which underlies the effectiveness of rehabilitation. The acceptation and "real use" of those devices is still an issue since most of them are not easily available in current practice.

RESEARCH METHODOLOGY AND ETHICS IN PRM

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Research is a search for knowledge; it can be seen as an art of scientific investigation, or, better, as a movement from the known to the unknown, a voyage of discovery. The main aim of research is to find out the truth which is hidden and which has not been discovered as yet. Though being the result of a passionate search for truth, scientific research must be systematic in its method of defining and redefining problems, formulating hypothesis or suggested solutions; collecting, organizing and evaluating data; making deductions and reaching conclusions; and at last carefully testing the conclusions to determine whether they fit the formulating hypothesis. Research studies vary, according to the objectives of scientific research:

1. exploratory studies are designed to gain familiarity with a phenomenon or to achieve new insights into it;
2. descriptive studies serve to portray accurately the characteristics of a particular individual, situation or groups
3. analytical or diagnostic studies are used to determine the frequency with which something occurs or with which it is associated with something else;
4. hypothesis-testing, or intervention studies are designed to test a hypothesis of a causal relationship between variables.

Whatever the research objective and the study design, the scientific method is referred to basic postulates like:

1. it relies on empirical evidence;
2. it utilizes relevant concepts;
3. it is committed to only objective considerations;
4. it presupposes ethical neutrality, i.e., it aims at nothing but making only adequate and correct statements about population objects;
5. it results into probabilistic predictions;
6. it aims at formulating most general axioms or what can be termed as scientific theories.

Accordingly, the scientific method is free from personal bias or prejudice and the researcher is guided by the rules of logical reasoning.

DIAGNOSIS OF OSTEOPOROSIS: BONE DENSITOMETRY IN TODAY'S CLINICAL PRACTICE (DIAGNOSIS)

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Osteoporosis is the most common metabolic bone disorder characterized by low bone mass and microarchitectural deterioration, which subsequently increases bone fragility and susceptibility to fracture. The gold-standard method to assess BMD is dual X-ray absorptiometry (DXA). It has acceptable accuracy errors and good precision and reproducibility. DXA allows accurate diagnosis of osteoporosis, estimation of fracture risk, and monitoring of patients undergoing treatment. The World Health Organization defined osteoporosis as a T-score of -2.5 or lower. Normal is defined as a T-score of -1.0 or greater and osteopenia is defined as a T-score of -1.0 to -2.5.

The International Society for Clinical Densitometry (ISCD) recommends DXA screening healthy women for osteoporosis at age 65 and men without risk factors for osteoporosis at age 70, and screening higher-risk men and women earlier. The ISCD recommends obtaining BMD measurements of the posteroanterior spine and proximal femur. The lateral spine and Ward's triangle region of the hip should not be used for diagnosis, because these sites overestimate osteoporosis and results can be false-positive. Patients in whom the hip or the spine, or both, cannot be measured or interpreted, and those with primary hyperparathyroidism BMD may be measured in the forearm, using a 33% radius on the nondominant forearm.

Although DXA is gold standard for BMD measurement, mistakes in BMD testing are commonly seen related with patient positioning, interpreting DXA reports, and artefacts. Correct performance of BMD measurements using DXA requires rigorous attention to detail in positioning and analysis. When DXA studies are performed incorrectly, it can lead to major mistakes in diagnosis and therapy.

Physicians interested in osteoporosis management, even if not directly involved in the performance and interpretation of DXA, should be familiar with the correct DXA testing and interpretation to minimize serious errors and allow proper use of bone densitometry.

COMPREHENSIVE REHABILITATION OF SPORTS INJURIES

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The presentation analyses the basic principles of sports injuries rehabilitation, the stages of a tissue injury and the techniques used in rehabilitation of such problems. Since rehabilitation begins at the time of injury and continues even after the athlete's return to competition, the focus is on what is done at the field-side at the time of injury, in the rehabilitation departments and during the athlete's return to the field for training and competition. To design a rehabilitation plan which would maximize the restorative events, it is important to know the Pathophysiology of the tissue-injuries and the three stages of their healing process: the inflammatory stage, the fibroblastic-repair stage, and the maturation-remodelling stage. Knowledge of the several physical modalities used during the acute, sub-acute and functional phase of rehabilitation is important as well. Improvement of neuromuscular control, correction of maladaptive behaviours, sport-specific and multi-plane activity, functional retraining, balance & proprioception re-education and athletic psychological approach are essential parts of the whole rehabilitation program. Examples for mobility exercises, strength exercises and stretching exercises are presented for several muscle groups and the relevant joints.

RESEARCH AND PROFESSIONAL ACTIVITIES PRM SECTION OF UEMS

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The members of the European Union of Medical Specialists (UEMS) are the national medical associations of the European Union States. In parallel, UEMS is divided into Sections, one for each EU recognized primary medical specialty. The Section of Physical and Rehabilitation Medicine is one of these bodies. Delegates of PRM from each EU State and from associate and observer states participate to the activities of our Section. For functional reasons, the work in our Section is divided in three committees: The Board for Educational affairs, the Professional Practice Committee for the Field of PRM physicians' competence and the Clinical Affairs Committee for the quality of clinical care.
Especially in the Professional Practice Committee (PPC), a lot of work has been done over the last years, concerning research for the professional competence of PRM physicians and a lot of papers have been published in referred journals. The White Book of PRM in Europe, which was published in 2006 in two referred PRM journals, was prepared in the PPC with the collaboration of the other European PRM Bodies. Ten years later, we work methodologically for its revision. A series of published research papers for the role and competence of PRM physicians have been collected in an e-book under the title "The Field of Competence of the Physical and Rehabilitation Medicine Physicians -Part One".
Research continues in the PPC for the Competence of our physicians in other medical fields and the results will be first published in referred journals. Eventually, we plan to publish the part two of the e-Book "The Field of Competence of the Physical and Rehabilitation Medicine Physicians", including all these papers which will be published from 2015 to 2018. The aim is to give helpful e-books to our colleagues for their daily practice and for defending and promoting the PRM specialty among medical professionals of other specialties and in the negotiations with the authorities of national health systems.
All the above work is going to be presented during this presentation, indicating that research in the field of specialty's competence is as important and useful as the general medical research.

THE ROLE OF NUTRITION IN SARCOPENIA AND FRAILTY

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Sarcopenia has been defined recently by the EWGSOP as a geriatric syndrome characterized by progressive and generalised loss of skeletal muscle mass and strength, with a risk of adverse outcomes such as physical disability, poor quality of life and death. It may best be viewed as an organ failure (muscle insufficiency) and is usually chronic, but can develop acutely (for example, during hospital admission). It is linked, through physical frailty, to the development of physical disability.
Frailty is a biologic syndrome of decreased reserve and resistance to stressors, resulting from cumulative declines across multiple physiologic systems, causing vulnerability to adverse outcomes. More widely, frailty can be defined as the weakening of the resilience or capacity to cope, and to maintain and restore one's integrity, equilibrium, and sense of wellbeing in three domains: physical, mental, and social. Nutrition and physical exercise are the cornerstones of both prevention and intervention in sarcopenia and frailty. Resistance exercise training increases muscle strength and mass and improves protein accretion in skeletal muscles. Correction of nutritional deficits is needed, and caloric intake should be increased to cover increased demands posed by exercise. Protein requirements are also increased, with recommended intakes of proteins in sarcopenic patients of >1.2 g of protein per kilogram of body weight per day, except in patients with significant renal failure. Leucine, β-hydroxy β-methylbutyrate (HMB), creatine and some milk-based proteins may have beneficial effects on protein balance in skeletal muscle. Correction of vitamin D deficiencies is needed for proper muscle function, but the role of vitamin D in the presence of normal blood levels is yet to be determined.

GENERAL INTRODUCTION TO UEMS PRM ACCREDITATION

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The PRM Programme of Care (PRM PC) concept helps to describe real life activity in a structured and comprehensive way. PRM PC is composed of the following elements: epidemiologic and scientific foundations, target population, medical and rehabilitation goals, structured content with timeframe, relevant means (equipment and competencies), information management and indicators for further improvement approach. Participation in the UEMS PRM PC accreditation is a smart manner to promote your activity, to assess and improve your organization and to support financial requests. Gathering a series of programmes on the same topics will help to sort out similarities and differences throughout European countries before updating our standards. Moreover, the PRM PC concept puts the medical perspective forward in any discussion with policy makers and financial authorities. Accreditation is based on peer review of a written description using a structured template, which is available on www.euro-prm.org. This session is based on the last accredited programme, submitted by a Slovenian PRM team. It will let you understand the benefit of this exercise and make it easier for you to submit your own programme to UEMS PRM accreditation.

URINARY TRACT INFECTION (UTI) IN NEUROGENIC BLADDER: AN EVERY DAY CHALLENGE

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Urinary tract infections, despite major progress in the management of neurogenic bladder still remain an everyday challenge for the PMR physician . Actually UTI is still the first cause of rehospitalisation and complication in spinal cord injury population. Amongst the difficulties, diagnostic of UTI is still debatable, majority of patients use intermittent catheterization and face to chronic colonization, and symptoms are nonspecific. New biologic diagnostic tools are in development. The duration of antibiotics treatment is also a matter of debate. We will review recent recommendations about recurrent urinary tract infection in a pragmatic approach in order to help the patient and the physician to find the best way to control this major and frequent complication. New avenues of preventive treatment are in development, to replace chronic antibiotic therapy.

PRM IN SPECIFIC DISABLING CONDITIONS IN PEOPLE WITH CANCER

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Physical medicine and rehabilitation is used in oncology to mitigate and eliminate cancer-specific disabling symptoms and clinical signs, which is very much intertwined with palliative care. The most important physical procedure is kinesiotherapy, as the application of a therapeutic dose and purposeful movement. The main aims of kinesiotherapy on the locomotor apparatus are increasing and maintaining range of motion in the joint, muscle strength, coordination and speed of movement, local and general endurance, and improve the function of internal organ systems and has a beneficial effect on mental status. Massage can help reduce pain, tension, fatigue and depressive feelings in cancer patients. Specific massage grips successfully reduce nausea in these patients, especially after chemotherapy. TENS is an effective analgesic agents in patients with cancer, but it is contraindicated applications directly above cancers, or where there is a suspicion on it. Notable is the use of TENS to relieve nausea in chemotherapy. The application of hyperbaric pressure spikes leads to improved microcirculation and reduction of lymphedema, especially the hands that occurs after the removal of axillary lymph nodes or after radiotherapy. Acupuncture is proven to be successful method for the treatment of the symptoms of fatigue associated with cancer chemotherapy to improve the quality of life in cancer patients.

THE APPROACH OF PHYSIATRISTS FOR LOW BACK PAIN ACROSS EUROPE. THE RESULTS OF A SURVEY DONE BY ESPRM MUSCULOSKELETAL DISORDERS RESEARCH COMMITTEE

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In this research the aim is to investigate how physiatrists approach to low back pain across Europe. - A cross-sectional descriptive survey was carried out to define the clinical approach of physiatrists for low back pain by an online survey site (SurveyMonkey®). - The preferences, tendencies and priorities in the diagnosis, management and treatment as well as epidemiologic data for LBP in PRM practice is questioned in this Europe-wide study conducted under the control of ESPRM Musculoskeletal Disorders Research Committee.
The results are presented and discussed in details with numeric values.

NETWORK SUPPORT FOR STUDENTS WITH SPECIAL EDUCATIONAL NEEDS IN THE UNIVERSITY OF LISBON (REDE NEE-ULISBOA)

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The University of Lisbon (ULisboa) runs the Network Support for Students with Special Educational Needs (Rede NEE-ULisboa) in order to ensure effective and appropriate responses in its 18 schools. The Network is composed by representatives of all schools, Social Action Service (SASUL), Stadium of the University Lisbon (EUL) and students. Its primary goals are the identification, dissemination and implementation of best practices and sharing resources that promote attendance conditions and academic success of students with special educational needs.
In 2015 initiatives were developed in order to raise awareness of the academic community to the subject, disseminate good practices and the plan actions to be implemented in the future, namely:
• Review of the policies related to Students with Special Educational Needs of ULisboa;
• Seminars under the topic of "Students with Special Educational Needs in ULisboa"; Discussion forums about Policies, Practices and Inclusive Culture and workshops that aimed for the identification of strategies related to entrance, attendance and transition to the job market.
• Students with special needs exhibition Took place in Lisbon's Rectory, but will become itinerant for all the institutions' represented in the network. It includes a photo exhibition on the topic Barriers and Architectural Enhancers in ULisboa, activities and challenges that invite visitors to put themselves in the shoes of students with special educational needs, and videos.
ULisboa's presentation will include the action plan for 2016 which integrates the contributions collected in above mentioned initiatives.

VIBRATION THERAPY IN PRM

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In Rehabilitation Medicine, Therapeutic Exercise can be made in three environments: normogravity, hypogravity, and hypergravity. Therapeutic exercise in normo-gravity (TENG) is performed by the patient using free motion or resistance motion in normal gravity field (1g). It means moving in normal conditions, such as rehab gyms. Therapeutic exercise in hypo-gravity is performed by the patient using free motion or resistance motion in lesser gravity field (acceleration<1g) (TELG); it means therapeutic execises in pools, for example. Therapeutic exercise in hyper-gravity is performed by the patient using free motion or resistance motion in higher gravity field (acceleration>1g) (TEHG); it means moving during supplementation of vibration energy (TEVE).
TEVE can be used for ameliorating the flexibility; this target exercise can gain range of motion, solve postural problems, and cure focal muscle strains. Vibration exercise can increase proprioception drivers to fast regain drill and coordination after traumatic lesions.
The possible clinical applications are the followings:
Osteopenia, postmenopausal osteoporosis and non union fractures; muscular hypotrophy and hyposthenia, after PNS or osteo-mio-articular lesions or after ortho-surgical treatments; muscle retractions and shortenings, in ROM limitations, postural defects, and muscle lesions; proprioceptive deficits, in balance disorders, or after orthopaedic surgery, and in RSDS. Actually vibration application on patient needs a severe control by Physician, and a precise and warning application by PTs.

EFFECTS OF UPPER LIMB ROBOT-ASSISTED THERAPY ON MOTOR RECOVERY OF SUB-ACUTE STROKE PATIENTS

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Introduction: Numerous studies have demonstrated the efficacy of rehabilitation robots for treating motor impairments in upper extremities. This research was aimed to compare at follow-up a group with robotic therapy to a group with a traditional approach in sub-acute stroke, protocol using the InMotion2 in a multi-centre study.
Method: 52 sub-acute stroke patients at their first-ever stroke were enrolled 30 ± 7 days after the acute event and randomly assigned to the experimental (EG) (n=26) or control group (CG) (n=26). The following impairment evaluations were performed at the beginning (T0), at the end of the treatment (T1) and at follow-up 6 months after stroke (T2): Fugl-Meyer Assessment Scale (FM), Modified Ashworth Scale-Shoulder (MAS-S), Modified Ashworth Scale-Elbow (MAS-E), Total Passive Range of Motion-Shoulder/Elbow (pROM), and Motricity Index (MI). EG subjects performed 30 sessions of robot-assisted goal-directed planar reaching tasks. CG subjects received 30 sessions of upper limb rehabilitation treatment. All sample received a similar global traditional treatment.
Results: The two group didn't show any statistical difference at T0 in demographic and clinical date recorded. Statistically significant improvements were found in the FM (2.50), MI (2.76) and pROM (2.26) at T2 in EG in respect to T0, while in the CG was observed significant improvement at T2 only in FM (2.37) and MI (2.43). An inter-group analysis at T2 shows a statistically significant spasticity increase in the CG compared to the EG (p=0.031). A significant improvement in the EG compared to the CG was found at T2 in FM (p=0.10), in pROM (p=0.03) and in MI (p=0.005).
Conclusions: The upper limb robot-assisted therapy is able to reduce the motor impairment in subacute stroke patients to a larger extent than traditional approaches. The results achieved by the EG were maintained at the follow-up with greater improvements than those observed in the CG.

NEW TRENDS IN SELECTION AND USE OF OUTCOME MEASURES IN CLINICAL PRACTICE

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In order to be useful for their intended purposes, outcome measures (rating scales and patient-reported questionnaires) must provide information that allows valid inferences and decisions to be made. Basic classical test theory (CTT) is still widely used in peer-reviewed, indexed journals for validating these tools. CTT methods mainly focus on an instrument's total score that is simply asserted as the relevant statistic. But, this approach neglects a series of criteria that need to be considered when evaluating the psychometric properties of a measurement tool, and that can be analyzed by Rasch analysis (RA). The validation activities performed by RA are numerous; the most important ones are those connected with the analysis of: a) dimensionality; b) functioning of rating scale categories; c) internal construct validity of the measure; d) reliability of the scale, in terms of 'separation' (i.e. the ratio of the true spread of the measures with their measurement error). Thus, RA is being increasingly used in the development and evaluation of clinical tools for health care.
The purpose of the present lecture is to describe the main features of RA in assessing outcome measures, and summarize some results of our recent psychometric studies on outcome measures in Physical & Rehabilitation Medicine, in order to provide insights for the appropriate selection and use of outcome measures.
Physiatrists have a responsibility to ensure that measures used in clinical settings are psychometrically sound, and that they are administered thoughtfully and analysed correctly. The final users need to critically inspect each outcome measure and the related literature before adopting it for clinical practice, decision making, and policy development.

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MIRROR NEURONS AND MOTOR LEARNING

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Brain neurons associated with this system are activated not only when a subject effectively performs a given task, but also when it observes the same task performed by a third person. The activation of the mirror neuron system by observation takes place even if the observer doesn't develop any motor action by himself. The representation of a task by mental imagery also activates about the same mirror neurons as if this task is observed or performed. In addition, the activation of mirror neurons associated with a given task results in an increased excitability of the corticospinal tract specific to this task. In addition to its role during motor action where it enables the activation of the effector motor pathways, the mirror neuron system appears to play also an important role in motor learning through observation and imitation and the storage of motor representations.
The mirror neural network allows to activate the brain structures involved in motor control even if the corticospinal communication is disrupted. Therefore therapeutic methods which stimulate the activity of components of the mirror neuron system are promizing approaches to facilitate motor learning or re-learning after brain damage. Numerous publications on the rehabilitation of the upper limbs relate the positive effects of such treatments.
By modulating the excitability of corticospinal tract, the mirror neuron system exerts a differential effect on the agonist and antagonist muscles related to the task to be learnt or relearnt. This mechanism is very useful for the rehabilitation of motor disabilities associated to brain lesions where spaticity related to a dysfunction of reciprocal inhibition is very common.

HISTORY OF THE DEVELOPMENT OF THE EUROPEAN BOARD OF PHYSICAL AND REHABILITATION MEDICINE AND THE MEDICAL SPECIALITY OF PHYSICAL AND REHABILITATION MEDICINE IN EUROPE

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In Europe, discussions about the field of competence and the content of education and training of the new medical specialty of Physical and Rehabilitation Medicine PRM) started in 1954 during meetings of specialists from different European countries and national societies and in 1963 the European Federation of Physical Medicine and Rehabilitation (now European Society of PRM) was formally founded.
The section of "Physiotherapy" of the Union of European Medical Specialists (UEMS) was created in 1963, became truly active only in 1971 and got its proper legal form in 1974.
In 1968 a WHO Committee of Experts on Rehabilitation defined the content of the new medical discipline of Physical and Rehabilitation Medicine (PRM), set a minimal training duration of 4 to 5 years and recommended a chair of rehabilitation medicine in every faculty of medicine. In 1969 The European Academy of PRM was founded.
In 1989 Academy, Federation and UEMS Section wrote the first "White Book of Physical and Rehabilitation Medicine".
In 1991 the European Board of Physical and Rehabilitation Medicine (EBPRM), the third speciality board initiated by a UEMS specialist section, was registered as a foundation in The Hague. The main task entrusted to the EBPRM was to harmonize pre-graduate, post-graduate and continuous medical education in PRM all over Europe at the highest possible level.
The EBPRM developed a certification system for PRM specialists, trainers and training centres. A certifying European MCQ examination for young PRM specialists and last year trainees is run since 1993.
In 2006 Section, Board, Society and Academy published the second white book on PRM.
Presently the EBPRM has about 1000 Fellows, Senior Fellows and Life Fellows, 80 Trainers and 20 Training Centres in good standing. Every year nearly 100 candidates take the MCQ examination to become Board Fellows.

EFFICACY OF EXERCISE ON TENDON HEALING: WHY ECCENTRIC EXERCISE?

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Tendons are important anatomical structures because they transmit the force developed by muscle cells to bones, making movement possible. The fundamental biochemical component of tendon is collagen. Tendons respond to mechanical loading and unloading and are at risk of injury during activities such as exercise training and sports. Tendinopathies are common in many activities particularly when jumping is involved and occur more frequently with an increase in training volume or load. The clinical signs of tendinopathy include morning stiffness, pain, and impaired performance and an accurate diagnosis can be made with the use of ultrasound techniques. Pathological findings include disorganized collagen fibrils, degeneration, apoptotic cells but classic inflammatory cells are absent. Exercise training is an essential element in the rehabilitation of these injuries; particularly eccentric exercise. This type of exercise is characterized by high force production in the presence of low energy cost. Inappropriate use of eccentric exercise may result in muscle damage. Together, many clinical studies have shown that eccentric exercise is an effective, low risk, and low cost option. Eccentric loading increases growth factors, collagen net synthesis, tendon cross-sectional area, and tensile stiffness. Further eccentric exercise training is associated with a reduction in new vessel and formation, resulting in pain relief. The basic mechanism of action that underlies these adaptations involves the transmission of the strain through the extracellular matrix to the cytoskeleton of mechano-sensitive cells via membrane proteins such as integrins. Deformation of tendon cells initiates the expression of genes responsible for collagen metabolism. Exercise prescription must consider the magnitude of the load as well as the frequency, strain rate, and duration. Eccentric exercise can be as effective as heavy slow resistance training in the rehabilitation of tendinopaties.

ROBOTICS AND NEW TECHNOLOGIES BRINGING INNOVATIONS IN REHABILITATION

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Rehabilitation growth is showing increasing interactions with the growth of technology and its innovative applications, even if many machineries are in PRM roots. New advanced and robotic equipments for evaluations and treatments are interacting actively with many rehabilitation practices in clinic, education and research too, very often modifying previous paradigms. Treatments can be enriched in times and training, in repetitions and intensity aiming to motor and cognitive learning; treatments can be standardized and results can be actively evaluated finding large numbers of evidences. Can be measured all aspects in treatments and in patients performances, maintaining data for research and multi-centre survey. We can apply tele-rehabilitation and auto-treatment as methodologies in rehabilitation centre but also as an extension of treatment in personal environment of patient. It is possible to enhance therapies and to improve patient numbers too, checking also the costs. Many relevant perspectives for research: motor control, balance, standing, walk, upper limb and manipulation connected with cognitive aspects, mobility, behaviour, occupational activities and home autonomy. On the other hand there are many criticisms to be solved in this development: education programmed to be adjusted for PRM specialists and all other involved professionals . These new methodologies offer a new point of view regarding care evaluations and relationships with patients and community to apply ICF methodology: are changing and upgrading mainly the patient' role (together his caregivers and context) to be now more and more really (aware and free) person in the centre of cares aiming to Functioning and Health.

UPDATE ON DEFORMING SPASTIC PARESIS

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Deforming Spastic Paresis is first an issue with the antagonist muscle. There is a muscle disorder inherent to spastic paresis - spastic myopathy, which reduces muscle length and extensibility. There is also a neural disorder, including paresis (reduced amount of descending command that can bring the agonist motor neuron above firing threshold) and antagonist overactivity that particularly affects the more contractured muscles. Part of this antagonist overactivity is a misdirection of the supraspinal descending drive to the antagonist, termed spastic cocontraction.
For the muscle disorder, prolonged daily self-administered stretch postures may gradually lengthen muscles and reduce their stiffness, therefore their spindle sensitivity. For the neural disorder, programs involving rapid alternating maximal efforts, or unassisted rapid alternating movements of maximal amplitude, gradually reduce cocontraction by restoring reciprocal inhibition between antagonists during motor command. The recently developed concept of Guided Self-rehabilitation Contracts (GSC) is conceived as a diary-based strategy to produce or increase patient and therapist motivation, therefore rendering the combination of daily intensity and long-term duration of the rehabilitation work realistic. Using a specifically-designed manual, a large scale, randomized controlled trial is underway to compare Guided Self-rehabilitation Contracts with conventional community-based physical therapy. Complementing the manual, a multi-lingual application for tablets and cell-phones - i-GSC - has been produced as an easy-to-use tool to increase patient long-term engagement and to facilitate progress monitoring, program adjustments and communication with the therapist.

ESPRM PUBLIC HEALTH COMMITTEE SESSION, INTRODUCTION

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The Public Health Committee of the European Society of Physical and Rehabilitation Medicine aims at identifying relevant topics of public health related to Physical and Rehabilitation Medicine as well as developing solutions. The session is going to deal with perspectives of the implementation of the International Classification of Functioning, Disability and Health in health reporting in health systems and rehabilitation services, the development of an International Classification of Service Organization in Rehabilitation and a systematic approach to assess and implement rehabilitation services in health systems.

IMPLEMENTATION OF PHYSICAL AND REHABILITATION SERVICES

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The WHO Global Disability Action Plan 2014-2021 "better health for all persons with disabilities" among others sets the goal to implement rehabilitation services for all persons in need. This includes acute, post-acute and long-term services at primary, secondary and tertiary levels of health care. Such an implementation requires a systematic assessment of existing services including the rehabilitation workforce. Additionally prototypes of rehabilitation services must be described. Within the framework of the collaboration plan of the International Society of Physical and Rehabilitation Medicine with the World Health Organization a Rehabilitation Service Assessment Tool (RSAT) and a Rehabilitation Service Implementation Framework (RSIF) is under development. The principles of these instruments will be presented and discussed and its applicability will be demonstrated using the results of the consultancies to develop national Disability, Health and Rehabilitation plans for Egypt and Ukraine.

RESEARCH, BASIC AND TRANSLATIONAL SCIENCE IN BALNEOLOGY

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For the application of physical and balneological modalities it is important to know their mechanisms of action. Additionally the development of new areas of application basic research is a precondition. Starting from well-described mechanisms a systematic pathway for the development of clinical applications shown for two examples: bathing in CO2-containing waters and drinking of mineral waters containing HCO3. It will be discussed what can be learned for (new) indications and necessary clinical trials. As an outlook, a model to use new results from the research on the mechanisms of chronic pain will be demonstrated.

NEEDS AND IMPROVEMENTS IN PRM AND PROFESSIONAL EDUCATION

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During last years the demand for rehabilitation services is growing due to the growing number of persons with disabilities for reasons like ageing of the population and increase of chronic diseases.
The use of robotic devices in rehabilitation by persons with disabilities is one approach to solve individual activities of daily living problems. The aim is to gain more independence and control with considerable improvement of quality of life. There is growing evidence that robotics can be used as general tool to harness brain plasticity and promote recovery, and its improvement, especially in patients with neurological disorders. The introduction of leading-edge technologies in the treatment of disabilities is very important in order to improve the efficiency of medical rehabilitation. The conjunction medicine and engineering in the field of rehabilitation is the future for new effective methodologies and treatments.
The innovative rehabilitation techniques and the introduction of robotics in rehabilitation raise the need of adequate education, both for medical doctors that work in the field of Physical and Rehabilitation Medicine and for medical professionals, such as physiotherapists, occupational therapists, nurses etc. This education should aim at improving the knowledge and competences of medical specialists about the use of powered devices for improving function or mobility in individuals with disabilities: of robotic devices for movement therapy and for the chronic assistance of human function. This education should be organized in cooperation with other professionals involved in robotic rehabilitation – technicians and engineers. Studying the possibilities and use of robotic devices in Rehabilitation should be included in the curriculum of PRM trainees and physiotherapists and also in continual medical education of PRM specialists.

EFFECT OF RADIAL SHOCK WAVE THERAPY ON MUSCLE SPASTICITY

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Extracorporeal shock wave therapy (ESWT) has been used for the treatment of chronic musculo-skeletal disorders in the last decades. Recently a new field of its application has been studied - for reduction of muscle spasticity as a result of upper motor neuron injuries.
The author presents the knowledge about extracorporeal shock wave therapy: physical and biological principles of shockwave therapy, pathophysiology, basic research, principles of shockwave application.
Recently some studies were published about the efficacy of SWT in the treatment of muscle spasticity in brain injuries: after stroke, in cerebral palsy and in patients with multiple sclerosis. The results of these studies are discussed.
The author presents also own experience about the effect of radial shock wave therapy for reduction of muscle spasticity in children with cerebral palsy - spastic diplegia and hemiplegia. After RSWT, a significant increase in passive range of motion and decrease of the score of the Modified Ashworth Scale were observed, which persisted at fourth week follow-up. Baropodometric measurement (static and dynamic) showed a significant increase in the contact plantar surface area and in heel pressure. The possible mechanisms of reduction of muscle spasticity after the application of SWT are discussed.
Conclusion: Shock wave therapy could be considered as a treatment of choice for reduction of muscle spasticity in disorders of the central nervous system.
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OSTEOARTHRITIS. THE ROLE OF PHYSICAL AND REHABILITATION MEDICINE PHYSICIANS. THE EUROPEAN PERSPECTIVE BASED ON THE BEST EVIDENCE. A PAPER BY THE UEMS-PRM SECTION PROFESSIONAL PRACTICE COMMITTEE

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The presentation is based on the position paper prepared by the Professional Practice Committee of the Physical and Rehabilitation Medicine (PRM) Section and Board of the Union of European Medical Specialists (UEMS), regarding the field of competence of the PRM physician, based on the evidence of effectiveness of PRM interventions in osteoarthritis.

Osteoarthritis (OA) is the most common joint disorder and the major cause of chronic musculoskeletal pain and mobility disability in elderly populations. The prediction is that it is going to be the fourth leading cause of disability by the year 2020. Therefore, proper management of persons with OA is of substantial importance. The goal of the OA management is to reduce the impact of OA on the individual by reducing pain and improving function, activities and participation. The optimal management of OA requires the combination of both pharmacological and non-pharmacological interventions, an issue most of the main guidelines on the evidence-based management of OA share in common. There is good level of evidence about the effectiveness of PRM interventions in OA: high level of evidence about the effect of education, weight reduction and exercise and growing evidence about the effectiveness of physical agent modalities. PRM specialists are involved not only in diagnosis and medical and physical treatments of OA, but as a rehabilitation strategy, they also deal with the problems of person focusing on the improvement of all components of human functioning as defined in the ICF including personal and environmental factors with a holistic approach.

In conclusion, PRM specialists can make substantial contributions to providing management of OA in order to improve the functioning of individuals with OA from both personal and societal perspective.

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LOCAL SOFT TISSUE MUSCULOSKELETAL DISORDERS AND INJURIES. THE ROLE OF PHYSICAL AND REHABILITATION MEDICINE PHYSICIANS. THE EUROPEAN PERSPECTIVE BASED ON THE BEST EVIDENCE. A PAPER BY THE UEMS-PRM SECTION PROFESSIONAL PRACTICE COMMITTEE

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The presentation is based on the position paper prepared by the Professional Practice Committee of the Physical and Rehabilitation Medicine (PRM) Section and Board of the Union of European Medical Specialists (UEMS), regarding the field of competence of the PRM physician, based on the evidence of effectiveness of PRM interventions in local soft tissue disorders.
Soft tissue musculoskeletal disorders (MSDs) and injuries are associated with significant pain and loss of function that may lead to significant disability. The aim of this paper is to define the role of PRM physicians in the management of local soft tissue MSDs and injuries with their specific focus on assessing and improving function as well as participation in the community. The training of PRM specialists make them well equipped to successfully treat MSDs including soft tissue MSDs and injuries. PRM specialists may well meet the needs of patients with soft tissue MSDs and injuries using PRM approaches including 1) assessment based on the comprehensive model of functioning, the International Classification of Functioning, Disability and Health (ICF), that enable them to identify the areas of impaired functioning in order to apply necessary measures; 2) accurate diagnosis using instrumental diagnostic procedures in addition to clinical examination; 3) outcome measurements available to them; 4) evidence-based pharmacological and nonpharmacological treatments; and finally 5) maintenance of social involvement including "return to work" based on restoration of function, all which will eventually result in improvement quality of life for patients with soft tissue MSDs and injuries.
Key words: Musculoskeletal disease-Musculoskeletal system-Cumulative trauma disorders- Soft tissue injures-Pain-Physical and Rehabilitation Medicine.
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UPDATE IN CANCER REHABILITATION. THE STATE OF ART

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Cancer rehabilitation is a rapidly emerging and evolving medical field because of increases in the number of cancer survivors. Cancer and its treatment are associated with physical and psychosocial side effects. Cancer survivors experience reduced cardio-respiratory fitness, reduced muscle mass and strength, increased fat mass, reduced bone health, fatigue, anxiety, depression, sleep disturbances, lymphoedema and other complications such as radiation fibrosis syndrome.
The aim of the presentation is to discuss the basic principles and practice of safe and effective cancer rehabilitation, the select disorders that benefit from comprehensive rehabilitative care, the role of physical activity and the complex management of lymphoedema associated with oncological conditions, based on the best evidence.
There is good level of evidence about the beneficial effects of physical activity and exercise in cancer survivors during and after treatment: increased cardio-respiratory fitness, muscle mass and strength, body composition, reduced fatigue and depression and improved quality of life. Systematic reviews and randomized control trials demonstrate a variety of benefits for survivors mainly of breast, prostate and hematologic cancers, but also for colorectal and gynecological cancers.
The main principles of complex decongestive therapy for the treatment of lymphoedema associated with cancer and the evidence of its effectiveness are also presented.
Conclusion: Rehabilitation therapy (preventive, supportive and palliative) is a substantial part of the holistic approach in the management of persons with oncological diseases. Early intervention by rehabilitation team can minimize the long term disability caused by cancer and its treatment and contributes to improving function, activities and participation.

BOTULINUM TOXIN IN FUNCTIONAL POPLITEAL ARTERY ENTRAPMENT SYNDROME AND CHRONIC EXERTIONAL COMPARTMENT SYNDROME

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Background: Botulinum toxin A (BoNT-A) is used in the treatment of muscle hypertrophy but has never been used in chronic exertional compartment syndrome (CECS). The objective diagnostic criterion in this condition is an abnormally elevated intramuscular pressure (IMP) in the compartment. In this study, we measured IMP-1 minute-(P1) and 5-minutes (P5) after the exercise was stopped before and after BoNT-A injection.
Hypothesis: BoNT-A reduces the IMP and eliminates the pain associated with CECS.
Study Design: Retrospective Case series.
Methods: Injection of BoNT-A (Dysport®) in the muscles of moderately trained subjects with an anterior or anterolateral exertional compartment syndrome of the leg. The BoNT-A dose ranged from 76±7 to 108±10Units per muscle, depending on which of the five muscles in the two compartments were injected. Primary endpoint: IMP (P1, P5). Secondary endpoints: exertional pain, muscle strength, and safety. Follow-up: up to 9 months.
Results: 25 anterior compartments and 17 lateral compartments were injected in 16 subjects. The average interval time between the BoNT-A injection and post BoNT-A injection IMP measurement was 4.4±1.6 (3-9) months. In the anterior compartment, P1 and P5 fell by 63±17% ($p<0.00001$) and 59±24% ($p<0.0001$), respectively; in the lateral compartment, P1 and P5 fell by 68±21% ($p<0.001$) and 63±21% ($p<0.01$), respectively. The exertional pain was totally eliminated in 15 subjects (94%). In 5 subjects (31%), the strength of the injected muscles remained normal. In 11 subjects (69%), it dropped from 4.5/5 to 3.5/5 ($p<0.0.01$), although without functional consequences.
Conclusions: In this case series, BoNT-A reduced the IMP and eliminated exertional pain in anterolateral CECS of the leg for up to 9 months after the intervention. A randomised controlled study should be carried out to determine whether BoNT-A can be used as a medical alternative to surgical treatment.

CONGENITAL UPPER LIMB DIFFERENCES AND THEIR IMPLICATIONS FOR REHABILITATION MEDICINE

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Congenital upper limb differences are rare conditions with a great diversity of presentation and functional consequences. Children with their parents are seen in general hospitals and specialized centres. Nowadays prenatal counselling is also a part of the spectrum of care for these conditions. As these upper limb differences are rare conditions the risk of advices lacking a solid base is great, depending on several factors such as knowledge, experience, collaboration etc. In this presentation several aspects of these conditions will be discussed.
The great diversity of limb differences asks for a good classification. In 2010 Oberg et al.[1] gave a classification which also takes the developmental aspects into account. In Rehabilitation Medicine and Prosthetics the ISPO classification is in use which is a classification that to a great extent underestimates other differences than deficiencies, such as duplication, overgrowth etc.[2] Also the ISPO classification lacks functional components.
Consequences of limb differences are diverse as the conditions itself. Body structures and function are different with their effect on activities and participation. Interestingly there is no clear cut relationship between the body structures & function and activities.[3] Despite lacking of body structures and function high levels of activities can be achieved also on the performance qualifier. This also applies for quality of life measures.[4] In general well-being is not related to the extent of the differences but is determined by other factors.
Interventions for limb differences extend from counselling of the family, surgical interventions, adaptation measures, and psychological support to prosthetic description. As stated before many factors influence well-being, not all these factors can be influenced.
In general both physiatrists and other health professionals are inexperienced in these conditions so advices can result in delay or omitting of indicated treatment. This situation asks for specialized centres. More research is needed to determine which factors determine the outcome related to activities, participation and quality of life and how these factors can be influenced.

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NEW CHALLENGES FOR HARMONIZATION OF THE PRM IN EUROPE: WEST MEETS EAST EUROPE

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Introduction: In most European countries a model of multidisciplinary rehabilitation service is used, in contrast to the part of Eastern Europe. In the latter, there are sufficient numbers of physiotherapists and nurses, but a lack of occupational therapists, speech therapists and other team members in rehabilitation settings. Consequently, the model of multidisciplinary rehabilitation cannot be implemented in these countries.
Purpose: The aim of this study was to assess the applicable rehabilitation models in Eastern Europe.
Method: Questionnaires/formal interviews were chosen to collect the data about the situation in rehabilitation services.
Results: The connection among team members was found "vertical", contrary to the "horizontal" interaction that is specific to multidisciplinary model.
Discussion and Conclusions: This study evidenced that there is a lack of particular specialists in the rehabilitation services and the connection among team members is held in vertical interaction. Thus, it requires the reform of rehabilitation system on the national level. Moreover, the particular rehabilitation professionals should be prepared. On purpose to accelerate the reform specialist from Western countries should arrange the training of multidisciplinary rehabilitation model. The situation of rehabilitation in Eastern countries requires changes on a purpose to improve rehabilitation service.

PRM IN PATIENTS AFTER CARDIOTRANSPLANTATION

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Introduction: The first successful human heart transplantation (HT) was performed by Barnard in Cape Town, South Africa in 1967. Approximately 3000 heart and heart/lung transplants per year are reported to the Registry of the International Society for Heart and Lung Transplantation with estimates of 5000 total transplants performed worldwide each year. In Lithuania the first HT was performed in Vilnius in 1987. During last 25 years, more than 134 HT have been performed. Cardiac rehabilitation is the integrated treatment of individuals after HT with the goals of maximizing physical function, promoting emotional adjustment, modifying cardiac risk factors, and addressing return to previous social roles and responsibilities
Purpose: The aim of this study was to review the results of cardiac rehabilitation after heart transplantation in Lithuania, Vilnius University Hospital Santariskiu Klinikos.
Method: Cardiac rehabilitation began with risk factor reduction. Exercise testing after HT was used in determining exercise capacity post-transplantation. A 6-minute walk test, spiroveloergometer, treadmill was chosen for testing before and after cardiac rehabilitation. Exercise prescription for HT patients was similar to that used with patients who have undergone other cardiothoracic surgery. The one exception was that a target heart rate (HR) was not used unless the patient exhibits a partially normalized HR response to exercise.
Results: Since 2004 till now 110 HT have been performed in Lithuania.
Discussion and Conclusions: In this report I am going to discuss the results of cardiac rehabilitation after HT in Lithuania, Vilnius University Hospital Santariskiu Klinikos. Cardiac rehabilitation maximizes the person's functional restoration, allowing return to work, social roles, and recreational activity.

SEXUALITY AND DISABILITY

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Sexual dysfunction is one of the most important challenges for men and women with a spinal cord injury (SCI). Whereas sexual desire and interest is usually maintained, impaired motor function and altered sensibility may interfere with sexual activities. Direct physiological consequences occur due to altered autonomic nervous control. Indirect consequences are for instance problems with mobility and positioning during sexual activity, incontinence, spasticity, fatigue, depression and pain. Sexual identity, body-image and self-esteem may be decreased.

Physiological sexual responses can vary after an SCI depending on the level and completeness of the lesion. Psychogenic and/or reflex erection or lubrication are still possible in the majority of people with SCI, but pharmacological or technical aids may be needed. Ejaculation is only rarely possible spontaneously but can be obtained with vibrostimulation or electro-ejaculation. However, sometimes microsurgical sperm retrieval may be required. Sperm quality and more particularly sperm motility are often severely decreased necessitating assistive reproductive technology. After an initial period of amenorrhea female fertility returns to the premorbid status. Pregnancy and delivery can succeed but specific precautions and follow up by an experienced multidisciplinary team are mandatory. Parenthood can be very rewarding and improve quality of life of persons with SCI.

Sexual counselling should be performed very soon during rehabilitation and be continued throughout the entire rehabilitation trajectory. Education on the person's possibilities and encouragement of experimenting are the main items. Counselling includes a thorough neurological examination: sexual potential mostly depends on the areas T11-L2 and S2-S5. Genital arousal and orgasmic responses are regulated by the autonomous nervous system. Orgasm can even be described as a non-pathological analog of autonomic hyperreflexia involving a sympathetic storm arising from genital stimulation. Recent insights in the neurophysiology of orgasm create new options for persons with SCI.

DESCRIPTION AND CLASSIFICATION OF REHABILITATION SERVICES

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Rehabilitation can be regarded as a general health strategy with the aim of enabling persons with health conditions experiencing disability to achieve and maintain optimal functioning. Physical and Rehabilitation Medicine (PRM) is the medical specialty with a holistic approach to patients and deals with the consequences of a health condition, at the level of impairments (structure and function), activity limitations and also of participation restrictions taking into account personal and environmental factors. A stratified model for musculoskeletal and neurological rehabilitation has been described in a study performed in 2007, in collaboration with the Belgian Health Knowledge centre. It comprises three levels of rehabilitation: general, specific and highly specific rehabilitation, depending upon the level of complexity of the patient's rehabilitation needs and the incidence/prevalence of the health condition. Patients are to be assigned to a PRM service offering the adequate level of rehabilitation by means of a patient triage system. Services at these different levels should collaborate in a network. Depending on the phase (acute, post-acute and long-term) and the patient's evolution he can be transferred from one level to another during the rehabilitation trajectory. In an international effort a comprehensive classification system of health-related rehabilitation services is being developed. In this lecture a conceptual description of health-related rehabilitation as a basis for a classification of health-related rehabilitation services will be given: what is rehabilitation? What is a service? What is a rehabilitation service and how can it be described? Patients with rehabilitation needs should be treated in PRM services at the right time, right level of care with the right financing. Therefore different types of services should be classified with regard to their characteristics.

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NATIONAL REHABILITATION QUALITY MANAGEMENT PROGRAMS: APPLYING THE INTERNATIONAL CLASSIFICATION SYSTEM FOR SERVICE ORGANIZATION IN HEALTH-RELATED REHABILITATION AS A REFERENCE FRAMEWORK

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Rehabilitation is one of the our main health strategies (Stucki 2007). In the World Report on Disability (2011) rehabilitation is defined as "a set of measures that assist individuals who experience, or are likely to experience, disability to achieve and maintain optimal functioning in interaction with their environments". Since 2001 the International classification of functioning, disability and health (ICF) has been the universally accepted conceptual model of human functioning (WHO 2001). In light of the ongoing paradigm shift within WHO from considering health as "absence of disease of infirmity" towards "optimal functioning with complete physical mental and social well-being" (Stucki 2015), an effort has started for a system-wide implementation of ICF in rehabilitation (UEMS PRM Section workshop, Nottwil January 2016. An ICF data collection tool for rehabilitation as well as for general health care is under development. National models for the implementation of ICF in routine clinical practice and rehabilitation quality management programs are needed. National Rehabilitation Quality Programs should contain the International Classification of Service Organisations for Rehabilitation (ICSO-R, Meyer 2014). Rehabilitation services are : "personal and non-personal intangible products offered to persons with a health …, within an organisational setting, in interaction between provider and person, addressing individual functioning needs that aim at enabling persons to achieve and maintain optimal functioning, considering the integration of other services addressing the individual's needs …, and delivered by rehabilitation professionals, other health professionals, or appropriately trained community-based workers". The proposed rehabilitation service classification has 2 levels: dimensions and categories (Gutenbrunner 2015). The upper level distinguishes 3 dimensions: the service provider (with 9 categories), the funding of the service (with 3 categories), and the service delivery (8 subcategories). Rehabilitation services can be described and classified with regard to their characteristics within this reference framework.

STATE OF THE ART IN THE DEVELOPMENT OF THE COCHRANE PRM FIELD

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In 2014 the Evidence Based Medicine (EBM) Committee of the European Society of Physical and Rehabilitation Medicine (ESPRM) decided to create a Cochrane PRM Field (Negrini 2015). The PRM specialty covers a broad medical domain dealing with function, activities and participation in a large number of health conditions, mostly but not exclusively musculoskeletal, neurological and cardiorespiratory. In 2012 all rehabilitation papers published from December 2011 up to February 2012 in the Cochrane Library were reviewed (Zaina 2012): 242 reviews were scattered over 28 Cochrane review groups. But good quality evidence on PRM interventions is still relatively scarce. A Cochrane Field is the place where to encourage a debate to agree on solid research methods and tools compatible with these particularities. This should be done in close collaboration with related Cochrane Groups and Fields. The following organigram has been proposed (figure 1). There will be both an executive and an advisory board, as well as a coordinator for daily planning, organisation and harmonisation of activities. Three branches can be distinguished: fundraising, the units and the liaison function. The six units are: Cochrane PRM reviews database, PRM RCT database, Methods, Education, Publication and Communication. Workshops will be organized at ESPRM and ISPRM 2016 and an exploratory meeting will take place in Brescia in autumn 2016.

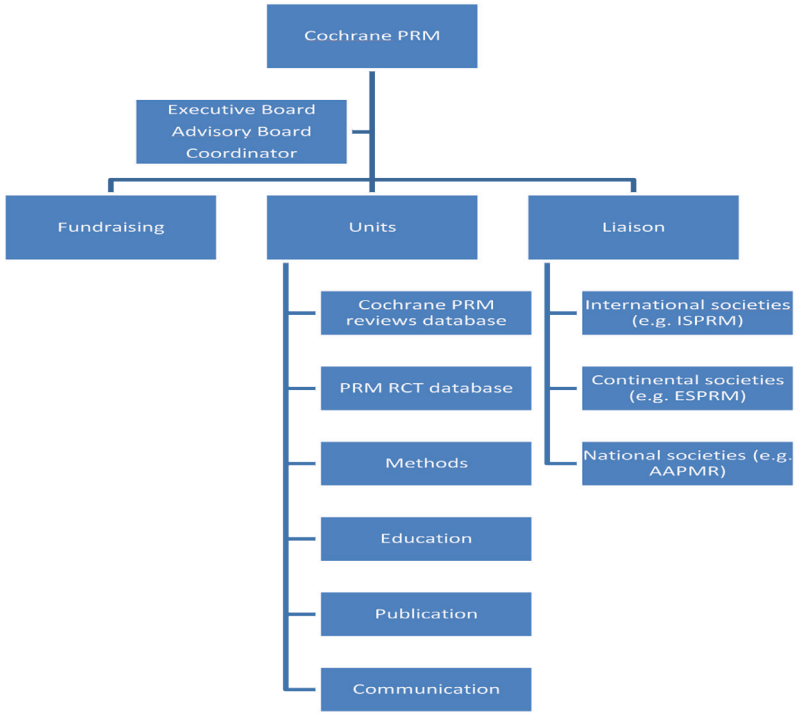


Figure 1: Cochrane PRM organigram

ETHICAL CHOICES IN REHABILITATION PRACTICE

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Rehabilitation is a one of the four main health strategies (Stucki 2007). In the World report on disability (2011) rehabilitation is defined as "a set of measures that assist individuals who experience, or are likely to experience, disability to achieve and maintain optimal functioning in interaction with their environments". In WHO the health paradigm is shifting from "absence of disease of infirmity" towards "optimal functioning with complete physical mental and social well-being" (Stucki 2015). Also rehabilitation needs are growing due to several current trends in healthcare such as ageing populations, improved knowledge and medical technology, increased survival rates and life expectancy, early start of rehabilitation and early discharge from acute care. Costs are growing in contrast with shrinking budgets. The primary goal of health care policy is to maximize the health of the population within the limits of the available resources, and within an ethical framework built on equity and solidarity principles, and we need to stimulate and make available innovative technologies that offer a therapeutic benefit at an acceptable cost (EU Council of Ministers of Health 2010). This implies choices, at a macro-, meso- and micro- level. Making choices in rehabilitation practice at these different levels will be explored in this lecture by means of some examples.

REGENERATIVE MEDICINE AND FUNCTIONAL REHABILITATION

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Historically, the foundation of physical medicine and rehabilitation training has provided the capabilities to optimize nonoperative treatments of a variety of musculoskeletal conditions, including acute and chronic muscle, tendon, ligament, and cartilage disorders. Traditional treatment of sports injuries includes use of the PRICE principle, NSAID, physical therapy modalities and corticosteroid injections in conjunction with specific rehabilitation exercises.
Modern rehabilitation medicine is propelled by newfound knowledge aimed at offering solutions for an increasingly aging population afflicted by chronic debilitating, degenerative conditions. Considered a core component of future health care, the rollout of regenerative medicine underscores a paradigm shift in patient management targeted at restoring physiologic function and restituting normative impact.
Regenerative interventions, known as regenerative medicine, including platelet-rich plasma injections and mesenchymal stem cells, recently have been used to treat chronic tendinopathies because of the potential of these interventions to facilitate tissue healing.Evidence for their efficacy in a variety of sports injuries has emerged as well as the role physiatrists should have in the inevitable growth of regenerative medicine applications.
Extracorporeal Shock Wave Therapy (ESWT) is a form of "mechanotherapy", that gained the field of musculo-skeletal diseases as Orthotripsy (mainly tendinopaties and bone regenerative disorders) and Regenerative Medicine as well. Although some details are still under study, it is known that SW are able to relief pain, as well to positively regulate inflammation (probably as immunomodulator), to induce neoangiogenesis and stem cells activities, thus improving tissue regeneration and healing. ESWT can be nowadays considered an effective, safe, versatile, repeatable, noninvasive therapy in regenerative medicine, in all cases where fibroblast activity and the interaction with connective tissue can be positively influenced.
Encompassing a growing multidisciplinary domain, the emergent era of "regenerative rehabilitation" brings radical innovations at the forefront of healthcare blueprints.

ASSESSMENT OF QUALITY OF LIFE IN NEUROREHABILITATION: WHEN, WHY AND HOW?

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Quality of life (QoL) is defined by the WHO as "individuals' perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their own goals, expectations, standards and concerns" In recent years, there has been increasing interest in using QoL as an outcome measure in the field of neurorehabilitation. Factors making up QoL are broadly reflective of physical and material well-being, personal development and fulfilment, relations with other people, recreation, and, social, community, and civic activities. There are two competing paradigms for the assessment of QoL and related concepts. The first argues that it is a multi-domain concept and is influenced by numerous factors, some of which may be unrelated to the individual's health or disease. The second paradigm for QoL is based upon more specific constructs such as subjective well-being or life satisfaction. Thus the differences between the paradigms can be viewed as the former being concerned with health status (or health-related QoL) and measured often by a profile of several dimensions (defined as objective QoL), whereas the latter is concerned with the subjective impact of the condition, usually measured by a single construct (defined as subjective QoL).
This presentation will make an overview of the challenges in assessing QoL in neurologically disabled people (e.g. dilemma of confounding function with health-related QoL, response shift phenomena, proxy assessment, subjective versus objective QoL, generic versus condition-specific measures) by examples from implications in stroke, spinal cord injury and traumatic brain injury and will consequently discuss why, when, and how to measure QoL in neurological disability.

COMPLEX REGIONAL PAIN SYNDROME: MANAGEMENT STRATEGIES

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Complex Regional Pain Syndrome (CRPS) is a chronic pain condition characterized by spontaneous and evoked regional pain of the extremity that is disproportionate to any inciting event. Main features include focal pain and sensory changes, vasomotor findings such as abnormal skin colour and temperature changes, abnormal sudomotor activity and edema, and often significant impairment of motor function and trophic changes. The possible underlying pathophysiological mechanisms are complex including involvement of both peripheral and central nervous system. The diagnosis relies on clinical criteria and no specific diagnostic test is available. Diagnostic procedures such as plain skeletal x-rays, three-phase bone scintigraphy, thermography, electroneuromyography, quantitative sensory testing and magnetic resonance imaging may be valuable to facilitate the diagnosis or to exclude other diagnoses . Early diagnosis and treatment results in a better outcome. Current management of CRPS requires interdisciplinary approach to achieve pain relief and functional restoration. Treatment strategies include physical and rehabilitative interventions, pharmacotherapy, psychotherapy and interventional therapies. Rehabilitative interventions, including physical and occupational therapy is the mainstay of treatment to promote functional restoration. Functional restoration emphasizes physical activity, desensitization, and normalization of autonomic function in the affected extremity and involves a steady progression from gentle, least interventions to the ideal complete rehabilitation. Pharmacotherapy includes antiinflammatory drugs, antidepressants, anticonvulsants, opioids, antiresorptive drugs, NMDA receptor antagonists, antihypertensives and topical agents. Psychological approaches are pain coping strategies, stress management and relaxation techniques, and cognitive behavioural therapy. Interventional approaches include sympathetic blockade, epidural blocks, intrathecal baclofen, surgical sympathectomy and spinal cord stimulation. The rationale and effects of these treatment approaches, as well as their place in the management algoritm will be discussed based on the recently published data.

INFLAMMATORY ARTHRITIS. THE ROLE OF PHYSICAL AND REHABILITATION MEDICINE PHYSICIANS. THE EUROPEAN PERSPECTIVE BASED ON THE BEST EVIDENCE. A PAPER BY THE UEMS-PRM SECTION PROFESSIONAL PRACTICE COMMITTEE

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Physical and Rehabilitation Medicine (PRM) specialists deal with a wide range of musculoskeletal conditions, including inflammatory arthritis. This paper aims to define the role of PRM specialists in people with inflammatory arthritis with reference to PRM interventions that have been shown to be effective. The goals in the management of inflammatory arthritis are to control pain and disease activity, prevent joint damage, protect and enhance function and improve health status and quality of life. Management of patients with inflammatory arthritis includes both pharmacological and non-pharmacological interventions. PRM specialists have distinct roles in the rehabilitation of these patients such that they effectively organise and supervise the PRM programme in the context of interdisciplinary team work. Their role starts with a comprehensive assessment of the patient regarding his/her impairments, activity limitations and participation restrictions as well as consideration of the environmental and personal factors. Then, in the light of the assessment results, appropriate PRM interventions individualised for the patient are administered. PRM interventions imply non-pharmacological (excluding surgery) treatments which include patient education for joint protection, energy conservation and self-management techniques, exercise therapy, use of physical modalities, use of orthoses / assistive devices and balneotherapy. Therapeutic patient education and exercises are the cornerstones of the therapy with strong evidence of their effectiveness to improve function. Physical modalities are primarily used to decrease pain and stiffness whereas orthoses and assistive devices are usually prescribed to enhance activities and participation. Future research and actions regarding the role of PRM in inflammatory arthritis should target access to care, updates on the use and effectiveness of physical modalities, orthoses and assistive devices, and standardization of therapeutic education programs for those patients.

Reference

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SHOULDER PAIN MANAGEMENT. THE ROLE OF PHYSICAL AND REHABILITATION MEDICINE PHYSICIANS. THE EUROPEAN PERSPECTIVE BASED ON THE BEST EVIDENCE. A PAPER BY THE UEMS-PRM SECTION PROFESSIONAL PRACTICE COMMITTEE

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One of the objectives of the Professional Practice Committee (PPC) of the Physical and Rehabilitation Medicine (PRM) Section of the Union of European Medical Specialists (UEMS) is the development of the field of competence of PRM physicians in Europe. To achieve this objective, UEMS PRM Section PPC has adopted a systematic action plan of preparing a series of papers describing the role of PRM physicians in a number of disabling health conditions, based on the evidence of effectiveness of the physical and rehabilitation medicine interventions. According to the PCC of the UEMS-PRM Section, the role of PRM physician in the management of shoulder pain (SP) has to be situated inside the general pain management field. SP is a common condition that can place limitations on the activity and restriction in social life participation of sufferers. A variety of shoulder problems, commonly including subacromial impingement, calcifying tendinitis, frozen shoulder, acromio-clavicular disturbances, gleno-humeral instability and gleno-humeral arthritis, can cause pain, and patients should be assessed and treated in order to relieve symptoms and reduce disability. This position paper describes the role of the PRM specialist in the management of such patients. Many assessment methods and treatment interventions are usually used in the management of patients with SP. Depending on the process, disability and patient characteristics, some intervention modalities have reported evidence in pain relief, movement and daily life activity (DLA) restoration, thus permiting a patient early recovery and social participation. Oral medications, local injections, physical therapy modalities and exercises are normally used for the management of SP. The PRM specialist should, always use this best medical evidence to decide how to efficiently and effectively reduce SP-related disability. An adequate therapeutic algorithm is also proposed in order to channelize the above mentioned evidence and reach the best results.

Reference:

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COMPREHENSIVE REHABILITATION AFTER TOTAL HIP AND KNEE ARTHROPLASTY

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The number of hip and knee arthroplasty procedures is increasing and reaches 154 THA and 118 TKA per 100 000 citizens in OECD countries in 2009-2010.
Majority of total joint arthroplasty was performed in patients 60-79 years old with advanced osteoarthritis. Health-related quality of life was improved after arthroplasties of the hip and knee.
A critical review of the literature shows that the wide range of rehabilitation programs, due to differences in types of applied prosthesis, operating approaches and physiotherapy methods, prevent a comparative assessment of the effectiveness of interventions. Differences in therapeutic management are caused by period of time between a surgical procedure and beginning of the rehabilitation as well as muscle efficiency of the pelvic girdle and lower extremities, balance disturbances, physical efficiency as well as fear of falling and comorbidities.
The analyzed studies found that the general recovery at 6-8 months post operatively was about 80% compared with the controls. It was proved that intensification of the rehabilitation program within three months following joint arthroplasty as well as implementation of progressive resistance training and training program based on neuromuscular principles allows for the optimal results. An important drawback in THA patients is fear of falling in everyday activities particularly while ascending and descending stairs and taking a bath.
Many authors reported functional problems in post-operative patients up to one year following the surgery and emphasized the importance of education in the area of self-care, activities of daily living in pre- and post-operative period and dietary intervention in individuals with BMI≥ 25.
In conclusion, an individual program of complex rehabilitation with functional therapy at all stages of the therapeutic procedure, the importance of education and safety instructions during intensive rehabilitation are crucial.

CLINICAL AND RADIOLOGICAL PREDICTORS OF RECOVERY FOLLOWING SCI

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A good estimation of the neurological recovery is critical for the spinal cord injured patient, his family and the health care team. Recovery prediction is fundamental for future planning of rehabilitation programs, for setting functional goals and organizing financial requirements. The primary objective of this presentation is to review the positive and negative, clinical and radiological findings for predicting neurological recovery following spinal cord injury (SCI).
The International Standards for Neurological Classification of Spinal Cord Injury (ISNCSCI) is a well-established examination tool used to determine the level and severity of a spinal cord injury. Almost all people with SCI show some recovery of motor function below the initial injury level with the vast majority of this recovery to occur in the first three months post injury. Evidence based knowledge of the course of neurological recovery empowers our ability to prognosticate performance in real life provided that we have the knowledge of the relationship of function to recovery.
The use of Magnetic Resonance Imaging (MRI) after acute spinal cord injury has significantly increased not only for its diagnostic role but also for giving prognosis. Sagittal T2 sequences can identify and measure the extent of both edema and hemorrhage within the spinal cord and appear to have the highest correlation with prognosis. Four signal patterns are commonly used in the literature. First pattern shows a normal MRI signal in the cord; second, represents single-level edema; third, is multi-level edema; and forth, is a mixed hemorrhage and edema. The prognosis of patients with single-level edema is significantly better than for those with diffuse edema and/or hemorrhage.

NOCICEPTIVE CONTROL AND FUNCTION

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Pain is a sensation related to actual or potential damage of the body. Pain and other bodily feelings constitute the sense of the physiological condition of the entire body. Emotion, motivation, and consequent behavior connected with these feelings characterize their homeostatic role.
The nervous system is organized at various neural levels, from spinal reflexes to voluntary action, to anticipate potential pain and to adjust behavior before the risk of tissue damage becomes critical. Neural mechanisms underlying nociception and pain perception serve the goal of limiting tissue damage. The nociceptive sensory information transmitted to the brain relies on an interplay between the inputs from nociceptive and non-nociceptive afferent fibers. These inputs are normally under strong inhibitory control in the spinal cord dorsal horn, modulated by interneurons.
Arthrogenic muscle inhibition (AMI) is a presynaptic reflex inhibition of joint musculature after injury to the joint, preventing the central nervous system from fully activating the muscles surrounding a joint. Motoneuron pool excitability is altered in muscles that act on painful joints. AIM is an important underlying factor in persistent muscle weakness after MSK injury or surgery. AMI is often observed bilaterally, not exclusively in the injured side.
Pain control after injury is important to prevent negative outcomes and to reverse AMI. The extent to which therapeutic interventions affect AMI is unknown.
The knowledge of pain physiopathology led to the development of multimodal analgesia and pharmaceutical products to treat pain. Joint cryotherapy and TENS transiently improve muscle function in AMI, allowing rehabilitation exercises and greater strength gains.
However, although exercise overload may provoke pain, it is the necessary stimulus for inducing physiological and neural adaptations that contribute to improved muscle function.

ASSESSMENT OF FRACTURE RISK IN PATIENTS USING BMD & FRAX (CLINICAL)

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Introduction: Osteoporosis (OP) is a systemic metabolic skeletal disease characterized by low bone mass, microarchitectural disruption, and increased skeletal fragility.
The importance of osteoporosis is related with the higher risk of fractures. It is paramount to assess the absolute risk of each patient to take the decision about initiate the specific therapeutics.
Methods: The Bone Mineral density (BMD) is a major determinant of bone strength, and is closely correlated with fragility fractures. In general, densitometric techniques have high specificity but low sensitivity, and over half of the subjects who experience a fragility fracture do not have OP as defined by BMD. Other fracture risk factors must be considered, e.g. female gender, advanced age, family history, and previous fragility fractures.
Accelerated bone resorption deteriorates bone strength beyond a given bone mass, and is related with a higher risk of osteoporotic fracture, but bone turnover markers (BTM) are not sufficiently validated for fracture risk prediction as well as for treatment monitoring, and this subject is still under research.
Combined approach using BMD with BTM may improve fracture prediction.
FRAX – Fracture Risk Assessment Tool – is an algorithm developed under the auspices of the WHO that allows the estimation of the individual risk of osteoporotic fractures over the subsequent 10 years. FRAX is based on clinical risk factors influencing the risk of fracture: age; body mass index; prior fragility fracture; parental history of hip fracture; current tobacco smoking; ≥ 3 months glucocorticoids use; rheumatoid arthritis; secondary osteoporosis; alcohol consumption. It can be used with or without BMD data.
Conclusions: The author, as member of the Multidisciplinary Portuguese Experts Group, presents the Recommendations on DXA request and indication to treat in the prevention of fragility fractures.

BREAKING BAD NEWS IN TRAUMATIC BRAIN INJURY

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Professionals dealing with brain injury patients consider an important part of their jobs interviewing patients or their families as an important work load with a considerable high emotional impact.
Traumatic brain injury is one of the leading causes of disability in the world. The sudden onset of the disease leads to a great impact not only to patients but also to their families.
The situation of disability of the patients, the inability to talk to them and the changes in the family structure after the injury lead to stress to the family members that require assistance and information to the doctors. The uncertain prognosis and the difficulty of explaining the functioning profile that may be acquired after rehabilitation is one of the most common causes of professional stress and burn out.
Health professionals in the field of rehabilitation need to deal with the disclosure of prognosis in order to establish the goals of treatment. Physicians working in this field have experienced that in many cases the families´ expectations of fully recovery and regain normality do not match the expectations from the rehabilitation team. In the cases in which the head damage leads to limit situations such as disorders of consciousness or severe impairment of mental functions the disclosure of a poor outcome can be arduous.
The communication between the doctor and family of a brain injured patient can reach delicate levels that can lead to the perception of a low quality treatment despite all the technically good approaches been done.
The aim of this paper is to explore the literature regarding breaking bad news in the field of acquired brain injury in order to detect the particularities and specific needs of this population in order to provide a better care.

THE CLINICAL USE OF THE INTERNATIONAL CLASSIFICATION OF FUNCTIONING, DISABILITY AND HEALTH

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The International Classification of Functioning, Disability and Health (ICF) was endorsed by the World Health Assembly in May 2001 with the aim to provide a scientific basis for understanding health and health related states within a common language that could be understood by different professionals across all medical and non medical disciplines.
Traditionally, medicine has based its treatments in making etiological diagnosis, setting pharmacological or surgical treatments and ultimately analyzing the outcome based on measures such as blood tests or radiological improvements, therefore, the majority of the clinical records are classified according to the International Classification of Diseases (ICF), classification also used in the reimbursement and distribution of money in the health administration.
But an etiological approach lacks in describing the functioning situation of the patient. Is he able to communicate, to walk, to do his home tasks, to go to the bank? And precisely this is the field of knowledge and action in rehabilitation.
In this sense, the use of ICF can be a practical tool to elicit and record information in the clinical history as a way to describe the funcitonal status assessment of patients, goal setting and treatment planning as well as monitoring.
This lecture aims to provide information of the practical tools based on the ICF to operationalize it in the practical day by day.

PEDIATRIC REHABILITATION IN A NEUROREHABILITATION UNIT: AN INTEGRATIVE APPROACH

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Several health conditions such as cerebral palsy, traumatic brain injury, spina bifida, muscular dystrophies or neuromuscular diseases can lead to disability of children and young adults. The complexity of the consequences of these conditions are wide including impairments of body functions such as mental retardation, diminishing muscle strength, spasticity, bone deformations among others. And the repercussion of these impairments has a direct impact in the activities and the participation of these children but also impacting parents functioning.
Since the consequences of these diseases do not focus on one single item, it is of utmost importance to have a holistic view on the impact and the sequelae in which a comprehensive management of disability is fundamental. The integration of separate disciplines such as neurologists, physiatrists, pediatricians, speech therapists, physiotherapists… are corner stones of care provision and communication among professionals are necessary in order not only to provide the best care but to a more efficient act of medicine. Common language of multi and interdisciplinary team working is then needed and in this sense, the biopsychosocial model of health promoted by the WHO can provide a framework that aims to describe functioning in a broad perspective including body functions, structures, activity, participation and environmental factors. Since 2007 WHO provided an adaptation of the ICF to the child and young adult population named the ICF-CY.
This lecture aims to bring the attention of the necessity of the integration of the needs of the children and the rehabilitation goals. With operationalization of ICF-CY in clinical practice we can have a practical tool to classify and describe patients in a more time efficient way by recognizing aspects of functioning that need to be assessed for the rehabilitation plan.

REHABILITATION OF CORONARY PATIENTS WITH CHRONIC HEART FAILURE: CLINICAL EVALUATION AND DESIGNS OF PHYSICAL TRAINING

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Better implementation of cardiac rehabilitation and dose of exercise training (ET) can become a powerful tool for reducing morbidity, mortality, and potentially the cost of health care in coronary patients with chronic heart failure that are in a stable phase. Of particular interest is a group of patients with heart failure and low left ventricular ejection fraction, and a group of patients with associated co-morbidities, as this patient population continues to increase.

It is necessary to identify the principles for the optimization of ET in order to achieve these goals, cardiac rehabilitation. First, it is necessary to determine the relative intensity of ET as well as training program. Training aerobic endurance is the most common modality enquiry training in patients with heart failure, and is therefore recommended as a basic activity. There is evidence that interval training can be superior in comparison with continuous training and contributes to greater growth and improve aerobic capacity, endothelial function and quality of life. Lower intensity aerobic training of 40% VO2 peak were shown to be effective in improving physical capacity in patients with heart failure who have had significantly lower levels of basal VO2 peak. The intensity aerobic training that matches the value close to the ventilator anaerobic threshold is proposed as a safe upper limit. Aerobic exercise between 15 and 40 minutes in length are shown as safe and effective, with shorter duration which is desirable at the beginning of the program, and in patients with reduced exercise capacity, fatigue, and recent hemodynamic instability. In these studies, the minimum three sessions a week are useful in stable patients NYHA I-III.

A training endurance should be sung as interval training, the movements of one or both extremities adjusted depending on the patient's psychological reactions and skill levels.

INTEREST OF GAIT VARIABILITY ANALYSES AMONG HEALTHY SUBJECTS AND PARKINSONIAN PATIENTS

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In addition to reduced gait speed, shorter stride length and stooped posture, typical gait disorders in Parkinson's disease (PD) are characterized by postural and gait instability, which can lead to an increased fall risk. A higher fall risk has typically been associated with a lack of adaptive gait control in the presence of sensorimotor variability or external disturbances. Thus, detection of specific markers of gait instability appears critical for preventing falls and their consequences.
Gait variables from standard three-dimensional quantified walking analyses do not constitute adequate predictors of falls. However, temporal organization of stride duration variability has recently been mentioned as a good candidate from which to derive markers of gait instability as it is tightly linked to rhythm control, which is particularly impaired in PD. Indeed, stride duration fluctuates in a structured, complex manner over the long term (hundred of gait strides), displaying the presence of long-range autocorrelations (LRA) that can span hundreds of consecutive strides. LRA result from the memory of the preceding values in the series, highlighting the existence of a complex temporal structure in human locomotion.
Interestingly, recent studies claimed that the temporal organization of variability (i.e., LRA) would represent the signature of adaptive abilities of healthy systems and their breakdown an index of pathological condition. By extension, the degradation of LRA with pathology was associated to dynamic instability in locomotion. However, no studies have included the analysis of LRA in the functional assessment of pathological gait. The interest of studying the gait variability on long series of stride with non linear mathematics will be presented, as well as their complementarity will short series classical methods (coefficient of variation). Effects of age, gait speed and terrain will be discussed.

HIGH-INTENSITY TRAINING IN NEUROLOGIC DISABILITIES

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Neurological diseases such as stroke, multiple sclerosis and Parkinson's disease are leading causes of life-long disability. High-intensity training has become an effective rehabilitation intervention to improve functioning and reduce disability in these persons. The most common forms of high-intensity training are Constraint Induced Movement Therapy (CIMT), Progressive Resistance Training (PRT) and Cardiorespiratory fitness training (CFT). Over the past decade scientific evidence supporting the use of high-intensity training in rehabilitation and as health promotion for people with neurologic disabilities has increased. In this presentation, there will be an up-to-date presentation of CIMT and PRT and current evidence for short- and long-term improvements in body functions, activities of daily living and participation in society following these interventions. There will also be a summary of recent published randomized controlled trials regarding the effects of cardiorespiratory fitness training in different neurological diseases on physical function, activity, participation, life satisfaction and mood. Finally, there will be a discussion about different barriers that can impede the use of training and exercise, and the importance of reducing these barriers to augment the implementation of such programmes in order to increase functioning and physical fitness level after completion of in-patient or out-patient rehabilitation.

PARASPORT, ADAPTED SPORTS AND THE PARALYMPICS MOVEMENT: OPPORTUNITIES FOR REHABILITATION MEDICINE

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Sport is an effective means of augmenting rehabilitation outcomes for people with disabilities. It involves recreational exercise as well as competitive activities all the way up to elite sports. People with disabilities should therefore have the right to participate in sports and have the same opportunities as able-bodied people. Sports for people with disabilities, referred to as parasport, and the Paralympic Movement is an evolving area. Since the start over 60 years ago, the Paralympic Movement and its governing body the International Paralympic Committee (IPC) has experienced exponential growth in the number of sports as well as the number of athletes competing in the Paralympics, the second largest sporting event in the world. This has led to an increased knowledge of adapted sports for people with disabilities. Research involving the Paralympic athlete is also a growing area encompassing basic science, applied science, social science, nutrition, and performance enhancement in both hot and cold environments. Overall, awareness is therefore growing about how to engage people with disabilities in parasport and using adapted sports in rehabilitation. This lecture will present: i) an overview of the clinical and scientific aspects of sports for people with disabilities, ii) the importance of parasport and adapted sports and how it can be incorporated in rehabilitation to enhance outcome in both a short- and long-term perspective, and iii) the evolvement of the Paralympic movement over 50 years and the opportunities for rehabilitation medicine specialists in this area.

THE ROLE OF REHABILITATION/PRM IN ELDERLY PEOPLE WITH NEUROLOGIC DISABILITIES

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Advances in treatment, physiatric care, and rehabilitation have improved survival greatly after neurologic injuries and diseases. This has increased longevity leading to a growing number of elderly people living with a neurologic disability. As a result, the clinical area and research field referred to as 'aging with a disability' has seen a rapid growth over the past decade. Still, in this group of people, life expectancy is lower than in the able-bodied population. As people with a disability are growing older, there is evidence of an accelerated aging of organ systems, exacerbating their disability. For people with a neurologic injury, age itself is associated more closely with increased dependence in daily activities than the actual injury itself. Injury-related impairments and activity limitations can increase over time, and superimposed disabilities can be experienced up to 20 years earlier in people with a neurologic injury or disease than in the able-bodied population. Even small changes in functioning can therefore have far-reaching consequences in their performance and engagement in everyday life. Moreover, the interaction with the surrounding physical and social environment considerably impacts disability of people with neurologic disabilities. This presentation will give an overview of the clinical area and research field 'aging with a disability', and the important role that rehabilitation/PRM can have for these people. The presentation will include neurologic disabilities, such as spinal cord injury, Multiple sclerosis and post-polio syndrome, and provide examples of the importance of the interdisciplinary rehabilitation to reduce their disability and enhance their quality of life. Many people with neurologic disabilities are growing old and have lived with their disability for several decades. Thereby, they comprise populations that are now commonly presenting to the rehabilitation medicine specialist.

CHINESE ACTION PLAN TO DEVELOP AND IMPLEMENT THE ICF CLINICAL TOOL IN REHABILITATION AND HEALTH CARE

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The Chinese leadership in rehabilitation medicine has in collaboration with the ICF Research Branch embarked in 2011 in an effort towards the system-wide implementation of the ICF in the healthcare system in China.
This presentation reports on the lessons learned in the pilot phase of testing the ICF Generic Set, a parsimonious set of seven ICF categories which have shown to best describe functioning across the general population and people with various health conditions, for use in routine clinical practice in China.
In the first part, the presentation responds to the question whether classification and measurement are compatible, what the right number of ICF categories is to include in data collection for routine practice, and addresses the usefulness of a functioning profile and functioning score for clinical practice and health research planning.
The second part proceeds then with some reflections on the use of ICF qualifiers as rating scale and the particularities of certain ICF categories contained in the ICF Generic Set when used as items in the Chinese rehabilitation and health care context.
The significance of the 3 levels of ICF application in clinical setting as well as challenges we are facing to are discussed.
This report concludes by identifying steps to be addressed to enhance the utility of the ICF in the system-wide implementation in rehabilitation and healthcare services.

PAIN MANAGEMENT IN THE EAST WORLD

Li Jianan

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Eastern medicine has fought against pain for more than 3000 years.
This presentation will introduce historical evolution of pain management by eastern medicine, featured with traditional Chinese medicine. The randomized controlled trials (RCTs) and basic researches are reviewed and analyzed.
Acupuncture and herbal medicine has occupy the main position in eastern medicine. There are 452 articles and reviews (4.07%) on herbal medicine and 1659 ones (25.41%) on acupuncture for pain management through international publications. There are few studies about dietary, qigong, taichi from China and Japan and yoga and other treatments for chronic pain.
It is exciting that most pain related functional diseases are effective and even have more cost-effectiveness rate than drugs. However, in most clinical studies, few researchers take it serious to diagnose with syndrome differentiation and holism concept, which are the core of clinical use of Chinese herbal medicine and acupuncture. Most selection of herbs and acupoints do not match the main principles of compatibility and theoretical features, which are hard to completely understand and most important to guide clinical application. In studies between acupoints and sham acupoints, people still do not understand the definitions of them and lack of strong evidence to differ the sham acupoints from real ones. With more public health workers taking part into translational medicine, it is a new problem how to shorten the gap between basic researches and clinical studies in eastern medicine.
This presentation will introduce the most important principle of herbal medicine and acupuncture, their clinical use in pain management, basic researches which supporting the analgesia effects in the last decade and the development and challenges we are facing to.

THE ROLE OF NUTRITION IN BONE HEALTH

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The best approach to meet the challenge of fragility fractures in the aging society is to identify the modifiable factors and focus on measures of primary, secondary and tertiary prevention. Due to the highly multifactorial nature of bone health, there is great need for focused yet integrated research in this area. The hazardous duet of osteoporosis and sarcopenia, i.e. the age-related degeneration of the musculoskeletal system, leading to reduced mobility, risk for falls and subsequent fractures, holds many pathogenic and treatment features in common. Understanding the mechanisms that leads to age-associated bone loss and bone quality deterioration can be key to develop effective interventions of prevention, cure and rehabilitation that can improve the quality of life of an increasing number of older persons who live in our society. Daily physical training combining endurance and resistance exercises, daily outdoor activities providing sun exposure, daily sufficient intake of proteins, e.g. of dairy products, meat, fish, egg, legumes like peas and beans, as well as of antioxidant and phytoestrogen rich fruit and vegetable intake will provide a life-style that will improve muscle fitness, reduce the risk of falls and reduce the fragility fracture risk in the old adult.

ROBOTICS AND NEW TECHNOLOGIES ARE MODIFYING TREATMENTS: LANDSCAPES IN EUROPE

Maggioni Giorgio

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There is in Europe a huge variety of Robotic devices available and both basic and applied researches are highly increasing; now several patient – tailored Robotic therapies exist for different pathologies and several trials are existing. But the literature does not really states that Robotics is nowadays well or correctly accepted by clinicians. Also the patients compliance is only recently better considered. We, in our Institute, performed a review searching PubMed, Embase, PEDro, CINHAL and the Cochrane Library retrieving more than 3000 records. We then considered only records developed in Europe and with the aim to study the use of Robotic devices, Virtual Reality (VR) or other new technology means. The remaining studies have been analyzed and most of them focus on robotic protocols, treatments modalities, effectiveness and scale's outcome, training design. Some studies assess integration of new technologies, but very few of them describe the human interaction, the clinician consideration and the impact of Robotics on therapy and users or stakeholders. Few existing EU frameworks, such as COST, or RCT, recently dealt with such problems: the involvement of European Scientific Societies, the results of large trials and available guidelines or recommendations are here discussed

PROPRIOCEPTIVE TRAINING AND INJURY PREVENTION

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Sports injuries are one of the most common injuries in modern western societies. Treating sports injuries is often difficult, expensive and time consuming and thus preventive strategies and activities are justified on medical as well as economic grounds.
From the literature it seems that:

1. a multi-intervention training is effective in reducing the risk of knee and ankle sprain injuries;
2. a combination of strength training, plyometrics, proprioceptive training, technique monitoring with feedback produced the most favorable results;
3. the higher the neuromuscular training volume the greater the prophylactic effectiveness of the program and increased benefit in injury reduction;
4. it may be optimal to initiate integrative neuromuscular training programs during early adolescence, before the period of altered mechanics that increase injury risk;
5. a proprioceptive training to prevent other injuries is controversial.

THE SPORT COMPETITION OF THE DISABLED PERSONS

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For several years the sports activity is considered, in its recreational and competitive way, an essential factor for the promotion of health and wellbeing of populations.
Based on this premise, the comprehensive rehabilitation programs were progressively including, on an equal footing with other therapeutic modalities, regular physical activity, as a mean of maximizing the motor component, without neglecting the cognitive and psychological components of the individual.
Is based in these benefits that the adapted sport is gradually introduced in daily activities of patient, initially with a therapeutic dimension, will progressively adding, when the individual potential allows, the aspect of competition, whether individual o collective, as a means of promoting the well living among them.
The CMRRC-Rovisco Pais, taking advantage of its facilities and the synergies with the therapeutic adapted sports in the institution, has implemented competition in some modalities, counting on his regular framework with athletes in Wheelchair Handball (4 and 7) Adapted Cycling, Adapted Table Tennis and Adapted Rowing.
The analysis and evaluation of the various components of health (medical, psychological, social, vocational) has demonstrated important benefits of sport, be it purely recreational, or having a progressive component of competition.
It is based on this finding we present the experience gained in recent years on monitoring these athletes, and their involvement in the adaptation of rehabilitation programs where this aspect is a decisive factor in its success.

RESEARCH AND ETHICS IN PRM

Michail Xanthi

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Immediate Past President of ESPRM
Life Fellow European Board of PRM
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The broad topic of research ethics is one which has been relatively well-investigated and discussed. However, the subject of unique issues in research ethics in the rehabilitation patient population has not been investigated to any significant degree.
Unique ethical challenges are encountered in rehabilitation patients due to the different types of patient diagnostic categories with commonly irreversible dysfunctions, interdisciplinary team involvement and extended hospital stay. As a result, rehabilitation doctors are frequently faced with chronic care dilemmas and moral distress, such as institutional ethics, professional practice and clinical decision making issues. Ethics in rehabilitation addresses a variety of issues that can be formulated as bioethical problems of conflicts of values related to respect for autonomy, beneficence, non-maleficence and justice.
Decision-making capacity, Communication issues, Timing of subject recruitment, The potential for overuse of individual subjects, Hope for a cure, Nature of the health care provider-research subject relationship, are some of the areas of specific concern when designing research protocols and recruiting subjects for participation in studies in the rehabilitation medicine setting. Researchers in the area of rehabilitation medicine should be aware of these unique ethical challenges posed by this patient population and should take steps to address any potential concerns in order to optimize subject safety and ensure that studies meet current ethical guidelines and standards.

PLACE OF BOTULINUM TOXIN IN DIAGNOSIS AND TREATMENT OF THE PIRIFORMIS MUSCLE SYNDROME

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Objectives: The piriformis muscle syndrome (PMS) has remained an ill-defined entity. It is a form of entrapment neuropathy involving compression of the sciatic nerve in the infrapiriformis canal by the piriformis muscle. Bearing this in mind, a medical examination is likely to be suggestive, as a classical range of symptoms corresponds to truncal sciatica with frequently fluctuating pain, initially in the muscles of the buttocks. However, the pathology is difficult to diagnose. This study aimed to devise a clinical assessment score for Piriformis Muscle Syndrome diagnosis and to develop a treatment strategy especially with the botulinum toxin.
Material and methods:
250 patients versus 30 control patients with disco-radicular conflict, plus 30 healthy control subjects were enrolled. A range of tests were used to produce a diagnostic score for Piriformis Muscle Syndrome and an optimum treatment strategy was proposed.
Results: A 12-point clinical scoring system was devised and a diagnosis of Piriformis Muscle Syndrome was considered 'probable' when ≥8. Sensitivity and specificity of the score were 96.4% and 100%, respectively, while the positive predictive value was 100% and negative predictive value was 86.9%. Combined medication and rehabilitation treatments had a cure rate of 51.2%. 122 patients (48.8%) were unresponsive to treatment and received OnabotulinumtoxinA. Visual Analogue Scale results were 'Very good/Good' in 77%, 'Average' in 7.4% and 'Poor' in 15.6%. 15 of 19 patients unresponsive to treatment underwent surgery with 'Very good/Good' results in 12 cases.
Conclusions: A PMS diagnosis is exclusively clinical, and the only objective of paraclinical evaluation is to eliminate differential diagnoses. The proposed evaluation score may facilitate Piriformis Muscle Syndrome diagnosis and treatment standardisation. Rehabilitation has a major role associated in half of the cases with botulinum toxin injections.

MANAGEMENT OF LOW BACK PAIN ON THE BASIS OF NON SURGICAL PROCEDURES

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Low back pain (LBP) is a leading cause of disability. It occurs in similar proportions in all cultures, interferes with quality of life and work performance, and is the most common reason for medical consultations. Regarding conventional non-surgical procedures there is a lot written and spoken, mostly with poor demonstrated benefits, except exercise that has randomized controlled trial evidence. So we will focus on reviewing the scientific literature about non-conventional non-surgical procedures for low back pain: yoga, acupuncture and moxibustion, tai chi, qi-gong, hippotherapy, reiki, and microbiome. These new treatment approaches are currently supported by scientific literature and clinical evidence, and show promising results as complementary treatments in LBP that should be taken into consideration.

DEVELOPMENT AND ACHIEVEMENTS OF THE EUROPEAN JOURNAL OF PHYSICAL AND REHABILITATION MEDICINE

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2014 marked the 50th anniversary of the European Journal of Physical and Rehabilitation Medicine (EJPRM), founded as Europa Medicophysica in 1965. Since the beginning it was the Official Journal of the European Federation and the Italian Society of PRM. The first Editorial Board included 28 people from 17 EU Countries. Today it is the Official Journal also of ESPRM, MFPRM, UEMS-PRM Section and Hellenic PRM Society. In 2005 PubMed/Medline indexed Europa Medicophysica (Eura Medicophys). This was the first stage of many subsequent achievements and initiatives: the ''free full text" in Internet; the systematic presentation of the rehabilitation topics developed by the Cochrane Collaboration, the change of the name to EJPRM, the collaboration with two other journals (Am. J. Phys. Med. Rehabil., PRM), the European Network of National Journals, the internal audit system, the achievement of the Impact Factor (with an outstanding first rate of 2.246), the publication "in association with" ISPRM, the application of the "Guidelines for reporting health research", the connection with the UEMS-PRM Section as their Official Journal.
Scientific journal's performance is measured mainly by bibliometric indexes. ESPRM used them to define and identify the core journals in PRM. In fact, over the past decade, the EJPRM has enjoyed incredible growth and now ranks among the core PRM journals, together with Arch. Phys. Med. Rehabil., Clin. Rehabil., J. Rehabil. Med., Am. J. Phys. Med. Rehabil., Disabil. Rehabil., Int. J. Rehabil. Res. The ratings for the core PRM journals are fairly consistent. Only the EJPRM, presumably due to its rapid growth, shows some fluctuations. Presently, the value of EJPRM is around 2 points Impact Factor.
The goal of the EJPRM is to be a readable and clinically useful journal. To do this, instead of devoting time to increasing the journal's Impact Factor, the aim is to enhance the clinical usefulness of the published papers. Having reached the 50-year milestone, the EJPRM is moving forward with other new journal features, that include the Debates, Narrative Medicine, and Cochrane Sections (the last together with the ESPRM Evidence-Based Medicine Committee and the Cochrane Institute).

REVISING A MANUSCRIPT

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We will focus here on specific issues that must regularly be faced by reviewers during peer-review. Authors writing a paper can also consider all these issues since, if adequately tackled, the peer review process is more likely be smooth and rapid, without problems arising.
Before accepting to perform the review there are some key questions related to adequate time, expertise, knowledge of the journal, conflict of interest. Before writing the review the questions include usefulness, importance, relevance and length of the research; previous publications; biases in reviewing.
About the title, that is the first reason why readers access a manuscript. Is it informative, realistic and correct and contain the key information ?
The abstract is the second main reason why a paper is accessed: does it respect the rules, appropriately summarize and is coherent with the manuscript, and can be understood without reading the manuscript?
The introduction: is concise, state clearly the purpose, provide a rationale and a well-defined hypothesis for the study?
The methods: are reproducible, coherent with the hypothesis and justified?
The results: are clearly explained, reasonable and expected, coherent with the Methods?
The discussion: is it concise, coherent with the hypothesis or research question, does include limitations, and are conclusions justified?

WHAT IS COCHRANE AND HOW IT IS ORGANIZED

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The European Society of Physical and Rehabilitation Medicine (ESPRM), together with the European Journal of PRM and the PRM Section and Board of the European Union of Medical Specialists (UEMS), started an action to establish a relationship with Cochrane (formerly the Cochrane Collaboration). Cochrane is a global, independent network of researchers, professionals, patients, carers and people interested in health, with contributors from more than 130 countries. Its aim is to produce credible, accessible health information that is free from any conflicts of interest. Cochrane produces the Cochrane Library, an evidence-based resource that includes today more than 6300 Cochrane systematic reviews. Cochrane is made up of many different review groups and other entities (such as Centres and Branches), distributed around the world, that are mainly focused on specific healthcare problems (diseases, or organs). Inside Cochrane also Fields have been created, that focus on a dimension of health care other than a specific healthcare problem. A Cochrane Field represents a bridge between Cochrane and the stakeholders of the related healthcare area. The medical specialty of PRM is covering a broad medical domain: it deals with function, activities and participation in a large number of health conditions, mostly but not exclusively musculoskeletal, neurological and cardiorespiratory. Consequently, the currently more than 200 existing Cochrane Reviews are scattered among different groups. A PRM Field could greatly serve to the need of the specialty, spreading the actual Cochrane knowledge, focusing needs today not covered by Cochrane Reviews, facing the intrinsic methodological problems of the specialty.

EVIDENCE BASED PHYSICAL AND REHABILITATION MEDICINE: CONSERVATIVE APPROACH TO ADOLESCENTS WITH IDIOPATHIC SCOLIOSIS

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Physical and Rehabilitation Medicine (PRM) plays a primary role in treating adolescents with idiopathic scoliosis (AIS): all therapies (exercises, braces) fall into PRM domain.
According to a Cochrane systematic review there is evidence in favor of bracing. Three meta-analysis have been published: one shows that bracing does not reduce surgery rates, but studies with bracing plus exercises were not included and had the highest effectiveness; another shows that full time is better than part-time bracing; the last focuses on observational studies following the SRS criteria and shows that not all full time rigid bracing are the same: some have the highest effectiveness, others have less than elastic and nighttime bracing.
Two very important RCTs failed in recruitment, showing that in the field of bracing for scoliosis RCTs are not accepted by the patients.
Consensuses by the international Society on Scoliosis Orthopedic and Rehabilitation Treatment (SOSORT) show that there is no agreement among experts either on the best braces or on their biomechanical action, and that compliance is a matter of clinical more than patients' behavior.
Research on AIS conservative treatment continuously decreased since the 80ies, but this trend changed recently. The SOSORT Guidelines offers the actual standard of conservative care.

REHABILITATION AFTER SURGERY OF LUMBAR DISC HERNIATION

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Purpose: The purpose of the study is to demonstrate the rehabilitation program and the long- term outcome after first lumbar discectomy, as well as frequency and effectiveness of regular exercises and back school advices on long-term outcome.
Material and methods: A group of 60 patients (31 male and 29 female) with first lumbar discectomy who had received ergonomic advices and learned exercises during the postoperative rehabilitation. They also got a booklet with ergonomic advices and exercises. They had follow-up assessment 1 to 5 years later (average 40 months). For assessment of pain, disability and impairment Japanese Orthopedic Association score scale was used. For statistical analysis frequency, Wilcoxon match paired test, Mann-Whitney test were used.
Results: After applied rehabilitation program patients had reduced pain and improved functional status. At follow-up patients had better outcome compared with that at discharge. Only 18 patients (30%) performed the exercises regularly and they had statistically better outcome than patients who didn't perform exercises ($p=0.009$). At follow-up 54 patients (90%) used ergonomic advices regularly, but six patients (10%) didn't use them.
Conclusion: Patients after first lumbar discectomy had good outcome after postoperative rehabilitation, and they had improvement at follow-up 40 months later. Thirty percent of patients performed exercises regularly and they had better outcome, and most of the patients use regularly ergonomic advices.

BALANCE AND GAIT IN NEURODEGENERATIVE DISEASE: WHAT STARTLES TELLS US ABOUT MOTOR CONTROL

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In his thesis entitled 'Balance and gait in neurodegenerative disease: what startles tells us about motor control', Jorik Nonnekes studied balance and gait in three different groups: healthy subjects, people with hereditary spastic paraplegia (HSP), and people with Parkinson's disease. Studies in healthy subjects were essential to investigate unaffected control of balance and gait. Studies in HSP and Parkinson's disease were performed to study balance and gait in two different neurodegenerative disorders that both develop slowly, but that affect different neural structures. In HSP, the corticospinal (pyramidal) tract is affected bilaterally. HSP is therefore termed a pyramidal disease. In contrast, Parkinson's disease is a typical example of an extrapyramidal disease. In particular, the thesis focuses on the role of the brainstem reticular formation in impaired motor control. An important method that was used to study the brainstem reticular formation was the startle reflex and the StartReact paradigm, in which reaction times can be accelerated by a startling stimulus. The results of the performed studies suggest that dysfunction of the reticular formation likely contributes to gait deficits in extrapyramidal neurodegenerative diseases, but that the reticular formation plays a compensatory role in gait and balance impairments in patients with pyramidal diseases. Last but not least, Jorik Nonnekes presents a treatment algorithm for freezing of gait, a gait disorder that is frequently seen in Parkinson's disease. In his treatment algorithm, which is published in the Lancet Neurology, Jorik highlights the important role of combined pharmaceutical and non-pharmaceutical treatment strategies in the management of freezing of gait.

EPIDEMIOLOGICAL PROFILE AND MANAGEMENT OF TRAUMATIC SCI IN LATVIA

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Introduction: Traumatic spinal cord injury (TSCI) suddenly changes the person's life and the subsequent consequences affect family, relatives and society. Patients with spinal cord injury usually have permanent neurologic deficits and disability. The person may often be affected by medical complications after SCI. Better knowledge of SCI can help in the planning of preventive measures and improving SCI management and treatment outcomes.
Purpose: To analyze epidemiological profile of TSCI and medical complications in subacute period during rehabilitation. To prescribe a journey of patient with TSCI in Latvia Health care system.
Methods: The study of epidemiological date is a single centre based retrospective review. Information was collected from medical records of 134 patients with TSCI admitted for subacute rehabilitation from January 2011 to December 2014. The study was carried out in UEMS PRM Clinical Affairs Committee accredited PRM programme for patients with SCI in post-acute phase of National Rehabilitation Centre "Vaivari", which is the only specialized place for SCI patients rehabilitation in Latvia.
Results: Epidemiological date over this period is the following: the mean age of patients with TSCI was 41.81 years and male to female ratio was 5:1. The leading cause of TSCI were falls (37.3%), followed by road traffic accidents (29.1%), sport and leisure activities (18.7%), other causes (7.5%), unidentified causes (5.2%), and assault (2.2%). The most common medical complications were the following: pain (76.9%), spasticity (47.8%), urinary tract infections (44.8%), pressure ulcers (24.6%), and orthostatic hypotension (14.2%).
Discussion and Conclusions: The profile description of a TSCI patient in NRC "Vaivari" in general complies with the one described in studies from other countries. Medical complications are various and they are an important factor following TSCI. We recommend UEMS PRM Accreditation procedure as a good tool to promote quality of SCI management.

EXERCISE PRESCRIPTION IN HYPERTENSION: EVIDENCE-BASED RECOMMENDATIONS

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Hypertension is a frequent health condition in advanced ages which is significantly associated with cardiovascular mortality via increasing the risk of coronary heart disease, stroke, and heart failure. Hypertension ranks as the most important one among modifiable risk factors for cardiovascular disease. Exercise training has an important role in favorably modifying this risk factor by its beneficial influences on arterial stiffness and baroreflex sensitivity, eventually leading to a decrease in blood pressure in persons with hypertension. The decrease in peripheral vascular resistance is thought to be the main mechanism for exercise induced acute blood pressure decrease (1). A systematic review and meta-analysis demonstrated substantial decreases in arterial blood pressure (up to -8.3 mmHg) in hypertensive individuals with moderate intensity aerobic/endurance exercise of 4 weeks or longer duration (2). Aerobic exercise in the form of walking or cycling at least 3 days a week for 30 minutes at an intensity of 40 to 60% of VO2 reserve (moderate intensity) is appropriate for lowering blood pressure (3). Dynamic or isometric resistance exercises of moderate intensity can also be added to the exercise training program (2). A careful evaluation of the hypertensive individual including exercise stress test before admission to exercise training as well as close monitoring during the program are needed. In conclusion, exercise training serves as an important nonpharmacological intervention in the management of hypertension.

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OSTEOPOROSIS. THE ROLE OF PHYSICAL AND REHABILITATION MEDICINE PHYSICIANS. THE EUROPEAN PERSPECTIVE BASED ON THE BEST EVIDENCE. A PAPER BY THE UEMS-PRM SECTION PROFESSIONAL PRACTICE COMMITTEE

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Introduction: One of the objectives of the Professional Practice Committee (PPC) of the Physical and Rehabilitation Medicine (PRM) Section of the Union of European Medical Specialists (UEMS) is the development of the field of competence of PRM physicians in Europe. To achieve this objective, UEMS PRM Section PPC has adopted a systematic action plan of preparing a series of papers describing the role of PRM physicians in a number of disabling health conditions, based on the evidence of effectiveness of PRM interventions.
Purpose: A wide range of health conditions treated by PRM specialists carries the risk of osteoporosis (OP), the consequences of which may be associated with significant disability. The aim of this paper is to define the role of PRM physicians in the prevention and management of OP, to describe the needs of people with OP in relation to rehabilitation strategy, and to highlight why and how PRM physicians should be involved in the diagnosis and management of OP.
Method: A thorough literature search was conducted regarding the evidence of effectiveness of PRM approaches in OP.
Results: PRM physicians may intervene in the prevention of and risk factor assessment for OP, falls and fractures. In addition, they are involved in the diagnosis and treatment of OP. From a specific PRM perspective based on the ICF, there is an important role in optimizing functioning and promoting "activities and participation", including interventions associated with environmental factors for people with OP or osteoporotic fractures. Evidence suggests that a large number of interventions within the scope of PRM that range from preventive strategies (including education and self-management and most importantly exercise) to pain management strategies as well as spinal orthoses or hip protectors may be effective in the prevention and/or management of OP and its sequelae.
Discussion and Conclusions: Competencies and aptitudes of PRM specialists, focusing especially on functioning while providing care over the whole course of a health condition from the hospital to the community, may well place them in the management of OP. Evidence-based effective PRM interventions further warrant the role of PRM physicians in the management of OP.

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GENERALIZED AND REGIONAL SOFT TISSUE PAIN SYNDROMES. THE ROLE OF PHYSICAL AND REHABILITATION MEDICINE PHYSICIANS. THE EUROPEAN PERSPECTIVE BASED ON THE BEST EVIDENCE. A PAPER BY THE UEMS-PRM SECTION PROFESSIONAL PRACTICE COMMITTEE

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Purpose: The aim of this paper is to describe the unique role of PRM physicians in the management of generalized and regional soft tissue pain syndromes.
Method: A thorough literature search was conducted regarding the evidence of effectiveness of PRM interventions in soft tissue pain syndromes.
Results: Evidence-based effective PRM interventions include exercise and multicomponent treatment including a psychotherapeutic intervention in addition to exercise, the latter based on strong evidence for reducing pain and improving quality of life in fibromyalgia syndrome (FMS). Balneotherapy, meditative movement therapies, and acupuncture have also been shown as efficacious in improving symptoms in FMS. Emerging evidence suggests the use of transcranial magnetic or direct current stimulation in FMS patients with intractable pain not alleviated by other interventions. Graded exercise therapy and cognitive behavioral therapy are evidence-based options for chronic fatigue syndrome. As for complex regional pain syndrome, strong evidence exists for graded motor imagery as well as moderate evidence for mirror therapy.
Discussion and Conclusions: PRM physicians' functioning oriented approaches on the assessment and management, adopting the ICF as a reference, may well meet the needs of patients with soft tissue pain syndromes, the common problems for whom are loss of function and impaired quality of life. Available evidence for PRM interventions serves as the basis for the explicit role of PRM specialists in the management of these health conditions.

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ULTRASONOGRAPHIC STRAIN MEASUREMENT IN TENDINOPATHY

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Tendinopathy is a major clinical problem based on its incidence and therapy resistance. It often interferes with daily or job related activities as well as sport performance in elite and recreational athletes. Though in essence multifactorial, mechanical overloading seems to be crucial in the etiology of tendinopathy. Numerous clinical trials have demonstrated the beneficial aspect of tendon eccentric training programs. However, the individualized optimal management for tendinopathy has not yet been described. Taking into account that loading management of the tendon is the key factor in tendinopathy treatment, knowledge of localized tendon strain in relation to exercise could be of utmost clinical importance. Thus far, tendon strain knowledge is mostly based on global tendon strain measurements of the (healthy) Achilles and patellar tendon. In this lecture the results of our recently published systematic review on strain mapping in the Achilles tendon will be presented, indicating the paucity of studies measuring in vivo local intratendinous strain in symptomatic tendons. Recent techniques including ultrasound based speckle tracking systems have rendered the possibility of noninvasive intratendinous local strain measurement. This lecture will address advanced information, mechanism and pitfalls of these new ultrasound based techniques. First results of tendon strain measurement in healthy subjects and in tendinopathy patients using ultrasound and speckle tracking algorithms indicate a non-uniform strain distribution in tendons. If this non-uniform strain intratendinous strain pattern could be incorporated in the individualized tendon training program, this most likely will represent an important step forward in the optimization of tendinopathy therapeutic management.

FUNCTIONAL CRITERIA FOR SPORTS RETURN AFTER ACL INJURY

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1. Consequences of ACL rupture
2. ACL reconstruction: main goals
3. Recovery for sporting activity ... low consensus, low evidence
4. Criteria used in sports returning - systematic review of 716 articles
5. Main criteria: criteria commonly used
    - Months after surgery (4, 6, 9 months?)
    - Physical examination elements (pain, range of motion,)
    - Muscle strength / quadriceps; hamstrings
    - Neuromotor control / postural stability...
    - Functional testing and scales / indexes
    - Biomarkers / type II collagen metabolism,
    - Psychological evaluation
6. Conclusion: a comprehensive model / functional dimension in PRM

STATE OF ART IN ASSESSMENT AND TREATMENT OF SLA: "FROM GENETICS TO THE BENCH"

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ALS is a neurodegenerative disease that mainly affects upper and lower motor neurons, it is an incurable fatal disease with a lifetime risk of approximately 1:400 with complex inheritance patterns and several intriguing features that remain unexplained. Though, the hallmark of the disease is "unpredictability" and scientific discoveries are accelerating with an unprecedented pace, to date more than 30 clinical trials have ended with failure and yet all of them were conducted after promising results in mice. There is now mounting evidence to suggest that the use of mice as a model system is not appropriate and a recent ALS/MND consensus meeting, also focused on the motor neuron requirements for survival to reveal information that can translate toward improvement of the human condition, and agreed upon the need for neuroprotection analysis.
This has been a major paradigm shift not only to the motor neuron but also to the preclinical or pre symptomatic phase that we do not know the duration, except that at symptoms onset occurs with a concurrent loss of 30% of viable motor neurons, conducting any kind of actual or future interventions to be early instituted, before the natural progressive loss nulifies the compensation process.
While genetics and drug trials are paving their own way, leaving us with hope in the next few years I will focus this presentation on the strict clinical symptomatic phase after diagnosis and extend it through disease clinical evolution to the loss of autonomy of a ventilator, targeting non-pharmacological treatment in ALS that are examples of areas that need to be considered and novel design strategies are warranted. To limit the scope of this presentation we discuss two controversial issues regarding non-invasive ventilation and exercise in ALS with an overview of the most recent published papers highlighted with our own group experience and ongoing work.

SCIENTIFIC AND HUMAN ASPECTS OF PERSISTING DISORDERS OF CONSCIOUSNESS

Playford Diane

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This presentation focusses on the research undertaken by a research team at the Royal Hospital for Neurodisability, London, UK and UCL Institute of Neurology. It focusses on the long term outcomes of disorders of consciousness, explores potential management approaches, considers the impact of caring for people with PDOC and reviews the ethical implications.

ROBOTIC AND NEW TECHNOLOGIES ARE UPGRADING TECHNICAL AIDS FOR INDIVIDUAL PARTICIPATION

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Innovative technology including robots, virtual reality and computer-brain interface are among the medical devices which deeply change the rehabilitation approach of neurological conditions as stroke, spinal cord injury and traumatic brain injury. Neurorehabilitation is aiming not only to improve functioning and activity, but also to reach the highest physical, psychological and social independence level. Repetitive movement and sensory stimulation play an important role in the rehabilitation of the patients with functional deficits due to neurological conditions. Nowadays, the latest clinical studies show that the new concept of neural plasticity can be applied effectively to the rehabilitation process of such patients, leading to improved outcomes and enhanced functional abilities. On this respect, new robotic assistive technologies was developed, aimed to enable functional movements with dynamic training regimen which exceed human capacity and allows monitoring of exercise variables. Innovative devices for lower and upper limb training combine dynamic body support with functional electrical stimulation, augmented feedback and virtual reality, enabling patients to practice repetitive tasks-oriented movement which will force use-dependent plasticity in order to enhance neural repair process. Non-invasive Brain Computer Interface for neurological conditions are limited to the rehabilitation of upper limb, but there are some works suggesting that there might be a common mechanism which influences upper and lower limb functional recovery, simultaneously. Coupling of rehabilitation robots with entertaining, motivating, virtual reality interfaces is an excellent manner to increase intensity of rehabilitation. From the perspective of bio-psycho-social model of rehabilitation, participation in meaningful life situations is an important aspect of functioning after CNS lesions. Analysis of clinically significant changes in individual's functioning suggests that rehabilitation may exert its benefits not only by facilitating activity, but also by preventing declines in community participation. However, few studies have included social participation or community integration as outcome measures in neurorehabilitation despite considerable evidence that participation and subjective well-being represent distinct and valuable outcomes which may reflect the importance of patients' preferences and values in evaluating the effectiveness of rehabilitation.

MUSCULO-SKELETAL ASPECTS IN GERIATRIC REHABILITATION

Quittan Michael

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The musculoskeletal system is crucial for human performance. It is not only a key player in human functioning but, as recent research demonstrates, additionally an important factor in metabolism and an endocrine organ by itself. The musculoskeletal system undergoes fundamental changes during the ageing process. Besides that various diseases further promote muscular atrophy. This ends up in Sarcopenia, the loss of muscle mass and function. The process is quite well understood on the molecular level.
Besides the muscle cell, the nervous system is crucial for adequate functioning in skeletal muscles. Therefore, neurodegenerative changes, by ageing and concomitant diseases, influence the quality of the neurogenic stimulus.
Taking these multifactorial aspects into account, "muscle wasting disease" is the term used in pertinent literature. Deterioration of skeletal muscles is, among others, responsible for the development of the frailty syndrome.
A diagnostic data set is not finally established yet, although different approaches exist. Easily applicable tests or biomarkers may help to identify patients who suffer from this disease.
Although structured and progressive strength training is the cornerstone in the treatment of muscle wasting, it may not be a practical option for bed-ridden, frail, sarcopenic or older individuals, or those with acute illnesses. Additionally, several other methods exist to slow down or reverse the process of muscle wasting. Among them are neuromuscular electrical stimulation and alternative exercise modes, positioning, stretching and, as an emerging field, drug therapy. Data about drug interventions grow slowly, but steadily.
A primary effort must therefore be to prevent further muscle loss and regain or maintain basic locomotor functions

DIAGNOSIS AND ASSESSMENT IN LOW BACK PAIN

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Low back pain (LBP) is the most common muskulo-skelettal condition in the world. Besides its socio-economic burden, LBP continues a diagnostic challenge for all doctors. All diagnostic aspects will be discussed in the perspective of the concept of evidence based medicine.
Of utmost importance in working up patients with LBP is medical history. It must include pain history localization, and intensity (visual analogue scale, numeric rating scale) demographics, involvement in workers' compensation or legal claims, work status, education, various measures of comorbidity, and previous treatment history. Comorbid conditions can be, among others smoking status, obesity, substance abuse, and widespread pain symptoms. Red and yellow flags must be evaluated.
Physical examination must include static and dynamic evaluation not only of the spine but also of pelvis, hips and lower extremities. All structures of this region need to be assessed.
Psycho-social impact can be evaluated by different assessment tools. Disease specific may be e.g. the Roland-Morris-Questionnaire, the Oswestry Disability Index, or the McGill Pain Questionnaire. Generic instruments may be the Medical Outcomes Study Short Form 36 or the Euro-QOL.
Functioning may be assessed by tests like the Five Times Sit to Stand Test or evaluation of lumbar extensor muscle function.
Despite frequently claimed weak association between degenerative spine changes on imaging and patient symptoms or function a thorough work up of the patient with subacute LBP must include imaging studies. Widespread use of magnetic resonance imaging (MRI) can be considered the most valuable technique. Not to forget and highlight recent developments in invasive diagnostic and therapeutic procedures.
All procedures should contribute to tailoring individual treatment and rehabilitation programs.

AGING WITH SPINAL CORD INJURY

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Accordingly to the World Health Organization there is an increasing number of aging people and this is the fact for people with spinal cord injury (SCI), too. The improved early and long-term survival post SCI and the rising incidence of SCI at older ages, are additional reasons for this.
Persons with SCI, experience "premature aging" with overuse syndromes (such as shoulder deterioration), sarcopenia, osteoporosis and low-energy fractures, and other musculoskeletal problems; increased risk of cardiovascular disease for persons with tetraplegia versus paraplegia as well as for complete versus incomplete lesion; high rates of impaired glucose metabolism and high rates of fatigue and weight gain.
Individuals aging with SCI face increased complication rates of neurogenic bladder and bowel dysfunction, skin problems, secondary complications (such as posttraumatic syringomyelia). SCI-related secondary complications can lead to additional long-term impairments. Environmental factors, such as socioeconomic issues, can further influence aging with SCI.
Individuals with long term SCI report new declines in function or increased disability. SCI duration more than two decades, and age ranging from mid-40s to early 50s are related with functional changes: fatigue, weakness, medical problems, pain, and disability-related complications (bowel, bladder, pain and fatigue problems). Women characterize their aging experience as "accelerated," while men characterized it as "complicated." Women reporte more effects of pain, fatigue, and skin problems and more transportation problems. Men experience more health problems, diabetes, and adaptive equipment changes.
Early interventions may help maximize function and minimize secondary health complications. Maintenance of independence in activities of daily living and quality of life can be achieved as individuals aging with SCI with access to specially health care services, appropriate assistive technology, home modifications and/or personal assistance.
Long-term rehabilitation planning and follow-up, enhancing healthy lifestyle and disease prevention, is necessary from the time of injury, in order to minimize late complications and delayed functional decline.

AUTONOMIC DYSREFLEXIA EUROPEAN MEDICAL EMERGENCY CARD, WORKING FOR A CONSENSUS

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Autonomic dysreflexia (AD) can occur in anyone with a SCI at or above sixth thoracic neurotome and it is a potentially life-threatening acute condition due to an excessive, uncontrolled sympathetic output in response to a noxious or no noxious stimulus below the level of injury. During the initial rehabilitation SCI patients must be trained in new ways on activities of daily living. Under such pressure, patients are not adequately informed about AD. Health personnel's knowledge is severely lacking in this area too. This fact has been documented in the literature. Future strategies raising awareness in AD are necessary.
An AD emergency medical card is one of them explaining AD to healthcare providers. Patients susceptible to AD should carry on them this card providing useful information of causes and acute management of AD. There are many different types, shapes, and sizes of AD cards. The ideal AD card should have a convenient shape, like a wallet card, to be easily carried, should have some personal information, should be official and printed by the PRM department, which is responsible for the accuracy of personalized information: level of injury, baseline blood pressure, previous AD episodes, etc. A universal form of the AD card translated in different languages could be more recognizable. In Conclusion, it is vital for SCI patients, caregivers and health personnel of Emergency Department to receive ongoing education and awareness concerning AD.

WHAT AMOUNT OF REHABILITATION TO IMPROVE MOTOR IMPAIRMENT AFTER BRAIN LESION?

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Several means have been described to enhance the amount of exercises provided to stroke additionally to conventional physiotherapy and/or occupational therapy. These treatments may induce an increased brain plasticity. The increase of treatment may lower the impairment due to stroke but has also been described to decrease the hospital stay as large as 14 days, the rehospitalisation rate and increase return to work. The most largely provided way to increase the number of steps was the mechanically supported gait rehabilitation by treadmill with or without bodyweight support and robotics. The same direction has been proposed for the upper limb improvement by robotic rehabilitation and serious games. The specificity of upper limb rehabilitation is its real association to virtual environments not really integrated for lower limbs. This link is an open space for the development of mixt rehabilitation programs that could manipulate cognitive variables to improve the motor output. Virtual reality systems without mechanical or connected devices have also been proposed. The most cognitive task added to conventional physiotherapy is motor imagery. This course will describe and summarize the efficiency of these additional methods and the amount of motor rehabilitation suitable after brain lesion.

ADAPTATION STRATEGIES IN AMPUTEES; WHAT IS THE ROLE OF TECHNOLOGY?

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Individuals with an amputation of a part of the lower extremity (transfemoral amputation [TFA], knee disarticulation [KD] transtibial amputation [TTA]) experience a loss of sensorimotor function of the ankle and, depending of the amputation level, knee of the amputated leg. Consequently, motor strategies used for locomotion are impaired which, amongst others, impacts balance, the ability to perform activities of daily life (ADL), and quality of life (QoL).
During the period of rehabilitation, a person with an amputation learns to compensate for the deterioration of these skills by adaptation strategies in both the intact leg and the remaining stump. Insight in the gait adaptation of TT and TF amputation in both the intact leg and the amputated leg could help improving prosthetic devices and form the basis for rehabilitation programs.
Different types of prostheses are available to substitute the amputated body part, including conventional non-adaptive and microprocessor controlled adaptive prosthetic knees and prosthetic feet.
In contrast to non-microprocessor controlled prosthetic knees, microprocessor controlled prosthetic knees are capable of adjusting the damping properties to changing user and/or environmental features (e.g. walking speed, prosthetic loading, stairs or ramps). These technical improvements in adaptive compensation could have a positive influence on balance, performance-based measures and QoL. However, new technologies such as prosthetic knees and foot which can actually deliver forces are even more promising to fill the gap between the loss of functional performance of the amputated leg and the substitutional functional performance of the prosthesis.
In this lecture, the role and value of technology in perspective of compensation for functional performance in amputees will be discussed.

MOTOR RECOVERY AND CEREBRAL PLASTICITY

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Brain plasticity refers to the ability of the brain to modify its own structure and function following changes within the body or in the external environment. Brain plasticity is well documented after motor recovery. Motor recovery refers to the restoration of motor function after damage of the nervous system. Motor function recovery is consecutive to the brain plasticity per se and the compensation. It follows a no linear recovery curve with a rapid first phase and a second slower or a curve with steps and plateaux. Different brain plasticity mechanisms contribute to motor recovery: regression of a cortico-subcortical diaschisis, plasticity of damaged hemisphere and/or undamaged hemisphere motor areas and new motor polysynaptic (propriospinal) pathways. Moreover unilateral damage of motor cerebral structures involves modifications of undamaged brain hemisphere activity and connectivity, particularly characterized by an over-excitability of the undamaged hemisphere. This over-excitability worsens the motor deficit and constitutes a maladaptative brain plasticity, which may be modified by cerebral modulation (rTMS or tTDCS technics).

ELECTROSTIMULATION FOR CHRONIC PAIN

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Electrostimulation has been utilized for pain relief since the dawn of medicine. However, only with the gate theory in 1965 by Melzack and Wall and the development of modern microelectronics did the interest increase and clinical use became common. Therapeutic modalities such as transcutaneous electrical nerve stimulation (TENS), spinal cord stimulation and peripheral nerve stimulation became available. After the initial enthusiasm, the use of these techniques has faded in many countries. Why? To many physicians without neurophysiological expertise, the effects were considered uncertain and shortlasting. But TENS is no cure, it gives temporary relief like analgesics. Furthermore, the effect of a physical modality depends on HOW it is applied. Also, it has in principle been impossible to finance large well-controlled studies of electrostimulation without industrial support. Hence, the evidence base has remained weak and systematic reviews are inconclusive. Since we now know that modern oral analgesics, whether NSAIDs or paracetamol, may show serious side effects long term, there is a renewed need for side-effect free therapy to treat chronic pain.
Mechanism-oriented research has made great progress since we in 1977 could demonstrate an increase in endorphin levels in human cerebrospinal fluid after low frequency high intensity ('acupuncture-like') TENS concomitant to the relief of chronic pain. We now know that a number of central antinociceptive mechanisms may be activated, and that stimulation of not only coarse myelinated afferents but also of thin myelinated afferents and of unmyelinated C-fibres increases the inhibitory effect considerably. By developing a new electrode matrix with small metal pins penetrating only the corneal skin layer, C-fibres can be stimulated effectively in humans, alleviating chronic pain resistant to TENS. Such cutaneous field stimulation (CFS) has the advantage over TENS in that it is placed on the painful region, rather than according to the neuroanatomical principles necessary with TENS.

THE PLAYFUL AND THERAPEUTIC SPORT IN THE REHABILITATION CENTRE

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The start of the rehabilitation process can be difficult. It's a new beginning to the disabled people.
The integration of the sports in this process can promote the better and quick integration of the disabled person in the society.
We are going to present the special sports project in the Centro de Medicina de Reabilitação de Alcoitão who intends to contribute to get the better physical and psychological function of the disabled people, and to get a new start of their life.

HOW TO ORGANIZE PRM IN ACUTE SETTINGS

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Patients with acute injuries, such as spinal cord injury, traumatic brain injury, hand trauma, multiple bone fractures and myocardial infarcts nowadays receive rehabilitation interventions before surgery, during chemotherapy or radiotherapy and immediately after injury or acute diseases. So do patients with conditions such as stroke, amputation, organ transplantation, burn wounds and cancer treatment. All these activities can be included in acute medical rehabilitation which is aiming at prevention of further physical and psychological deterioration, at improving functioning, treatment of common complications such as joint contractures or pressure sores, at providing information on future perspectives an on managing discharge to home or to further in- and outpatient facilities.
There are several ways to organize PRM in the acute phase. In this presentation four of the most common models of acute PRM will be presented: PRM beds in acute hospital, mobile PRM team, PRM consultations to acute wards and acute PRM centre.
Advantages and limitations of the four models will be discussed.

STROKE REHABILITATION INTO SOCIETY - ASPECTS FOR PARTICIPATION

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Background: In-patient rehabilitation is a commonly used complex intervention to improve the person's independence after stroke. Evaluation and comparison of the effects of routine clinical practice could provide a contribution in optimization of stroke care.
Research objective: To describe results of in-patient stroke rehabilitation as a complex intervention for and explore possible differences betweenEuropean countries.
Design: Data from adult patients after stroke receiving in-patient rehabilitation in Norway and Sweden as well as Sweden and Latvia will be presented. Qualitative description of systems, as well as information on basic medical and sociodemographic information, and organizational aspects were reported.
Results: The components of stroke care seem to be similar in in the three countries, but there are potential differences in the content. There were differences regarding start of rehabilitation as well as its length.
Conclusions: The content of in-patient rehabilitation is different in the three countries, although the components of the rehabilitation are reported the same, contextual factors may influence results. Therefore, comparison of stroke rehabilitation requires caution.
Author's disclosure: The authors have nothing to disclose.

PREDICTORS OF BETTER HEALTH AWARENESS IN PERSONS WITH SCI

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Better health awareness (HA) in persons with SCI is linked to appropriate health-related behaviors, better compliance, understanding how to manage secondary conditions, increased involvement of caregivers. Although rational, educational and informative interventions aimed at HA appear to be inconsistently evidenced regarding functioning, service use, quality of life, reduction of both direct and indirect costs of treatment. Client-related factors reducing the ability of a person with SCI to increase HA after health education include impaired adjustment to disability and poor social adaptation, cognitive deficit, mood disturbance, concomitant brain injury, history of learning disability, alcohol and substance abuse, chronic pain. Provider-related factors limiting the chance to improve HA comprise difficulty of matching provider's availability with the time the client is receptive, insufficient knowledge and inadequate attitudes of health-care providers. Several studies with a quantitative evaluation of HA allow to identify factors predicting better HA in persons with SCI: higher level of injury regarding awareness of autonomic dysreflexia; lower injury level regarding awareness of pressure sores and urologic care; traumatic SCI; longer duration of SCI, history of a secondary condition (except depression) regarding HA of a given health condition; better general health and motor functions (except preserved walking ability); social participation; being married; inhabitance in a big city; higher income; having private health insurance; younger age (in adults), older age (in persons below 21 years); caucasian race, higher level of education, rational health-related beliefs and behaviors; internal location of a locus of control, Internet access; having a health-care in the last year. Methodological limitations encountered in the analyzed studies included high non-response rates, use of heterogenous and non-validated tools. Results of the mentioned studies do not cover the entire scope of possible interactions in this field and apply univariate correlations only.

PRM ROLE IN LOW BACK PAIN PATIENTS AFTER SPINAL SURGERY

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Rates of unsatisfactory results of spinal surgeries (SS) reach 33% in a lumbar stenosis while in a disc disease are estimated between 25-54% (6-8 week after SS) and 5-22% (1-2 year following SS). Overall treatment effect in a disease appearing with a low back pain (LBP), besides character and advancement of underlying structural changes, depends on factors as LBP duration, joint range of motion, body-mass index, cardiorespiratory function, movement coordination, intensity of depression and anxiety, duration of sick leave, lifestyle, habits, attitudes towards self and professional activity, as well as expectations regarding treatment. The above factors can be addressed by a goal-oriented interdisciplinary rehabilitation. A contribution of PRM physician in a qualification of persons with a non-specific non-radiating LBP for a SS is warranted by the lack of evidence of better results of SS over rehabilitation. A PRM consultation before the scheduled SS reduces treatment costs by 12,1% and surgical costs by 25,1%. Pre-surgical rehabilitation consisting of education, physiotherapy and cognitive-behavioral therapy improves the cost-effectiveness of treatment, shortens average length of hospital stay and duration of sick leave. Rehabilitation following SS results in a better pain reduction and a faster functional regain in disc disease and lumbar stenosis. SS results tend to recede with the time elapsing from SS warranting the necessity of a continuation of a comprehensive treatment including PRM approach. Guidelines on rehabilitation of persons after discectomy are based on clinical consensuses, what reflex a paucity of evidence regarding the efficacy of interventions typical for rehabilitation in discectomized patients.
PRM physicians should be aware of the place, limitations and consequences of SS in the treatment of patients with LBP and be able to develop an individualized comprehensive treatment strategy before and after the surgery.

DIAGNOSTIC EVALUATION IN DYSPHAGIA - COMPLEMENTARY EXAMS

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Diagnostic procedures of oropharyngeal dysphagia should serve two purposes: to identify the anatomical or physiological abnormalities that cause swallowing difficulty and evaluate the effectiveness of therapeutic interventions to compensate the deglutition alterations and be able to start or maintain oral feeding. For the diagnosis of swallowing disorders, we rely primarily on clinical examination supplemented with instrumental techniques in other cases.

I'm going to focus my presentation in the videofluorsocopy and the esophageal manometry.

To date, videofluoroscopic exploration is considered to be the "gold standard" in assessing oropharyngeal swallowing. It is a radiological examination that enables real-time analysis of the propulsion of the bolus from the mouth to the esophagus, detecting dysfunctions in the oral and pharyngeal phase of swallowing, guiding treatment of oropharyngeal dysphagia and evaluating the effectiveness of different therapeutic strategies. As a contrast medium we use barium or iodinated contrasts, and different volumes and viscosities are explored. A complete swallowing sequence is recorded on high-resolution videotape. The examination is discontinued if the patient is unable to co-operate or recorded as aspirating. In the oral phase, the following parameters are analyzed: Oral transit time, tongue control, palatoglossal closure competence and piecemeal deglutition. In the pharyngeal phase, we evaluate: residue in the pharyngeal cavity after swallowing, cricopharyngeal dysfunction, pharyngeal delay time, pharyngeal transit time, laryngeal penetration and tracheal aspiration. Also we can quantify some temporal and spatial parameters.

Esophageal manometry measures the motor activity of the esophagus and its sphincters in basal conditions and in response to swallowing. In the study of oropharyngeal dysphagia it provides information about the strength of pharyngeal propulsion pressure, basal upper esophageal sphincter (UES) pressure, percentage of UES relaxation, and pharyngoesophageal coordination during swallowing. Examination is made using a polyvinyl tube with several channels.

Specific therapeutic interventions are indicated from the results of these explorations.

ATAXIA IN MULTIPLE SCLEROSIS. FROM PATHOPHYSIOLOGY TO EXERCISE PRESCRIPTION

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Detecting the sensory-motor mechanisms leading to imbalance in MS can steer the prescription of rational exercise programs. An overview is given on balance and postural control, and on sensory-motor interaction. The logic of exercise prescription then follows.

LEARNED NON-USE OF A LOWER LIMB: A MODEL WORTH TO BE TESTED IN ASYMMETRIC GAITS

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Learned non-use is known to underlie upper limb paresis in stroke and other asymmetric impairments. Unexpectedly, the same may hold during gait, only, for a lower limb. Based on gait analysis on a force treadmill (GAFT) examples are given on how "forcing the use" of the paretic lower limb can disengage a hidden muscle power from the paretic lower limb.

SPINAL PAIN MANAGEMENT. THE ROLE OF PHYSICAL AND REHABILITATION MEDICINE PHYSICIANS. THE EUROPEAN PERSPECTIVE BASED ON THE BEST EVIDENCE. A PAPER BY THE UEMS-PRM SECTION PROFESSIONAL PRACTICE COMMITTEE

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One of the objectives of the Professional Practice Committee (PPC) of the Physical and Rehabilitation Medicine (PRM) Section of the Union of European Medical Specialists (UEMS) is the development of the field of competence of PRM physicians in Europe. To achieve this objective, UEMS PRM Section PPC has adopted a systematic action plan of preparing a series of papers describing the role of PRM physicians in a number of disabling health conditions, based on the evidence of effectiveness of the PRM interventions. The aim of this paper is to describe the role of PRM physicians in the management of spinal pain focusing particularly on low back pain and neck pain. These disorders are associated with significant disability that results in activity limitations and participation restrictions. A wide variety of PRM interventions including patient education, behavioral therapies, exercise, a number of physical modalities, manual techniques, and multidisciplinary rehabilitation may help patients with low back pain and cervical pain in improving their functioning.
PRM physicians may address many of the problems encountered by these patients in many life areas taking the International Classification of Functioning, Disability and Health as a reference guide and may have an important role in improving the quality of their lives.

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EUROPEAN UEMS POSITION PAPER - NEW TECHNOLOGIES DESIGNED TO IMPROVE FUNCTIONING : THE ROLE OF PRM"

Varela Enrique Donoso[1], Giustini A., Franceschini M., Votava J., Zampolini M., Berteanu M., Christodoulou N.

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The growth in rehabilitation practice is showing increasingly strong interaction with the general increase in the potential of technology and its innovative applications. Currently the new possibilities offered by technologies support continuous development toward the better recovery of functioning and health for disabled people. The Professional practice Committee of the UEMS-PRM section has developed a position paper that synthesizes a common all-round view aiming to underline the main key problems, regarding the development of Physical and Rehabilitation Medicine Specialist role.
Such document suggests a sort of common "agenda" that can be carried out at European level and in any country, according to the different local situations, to support our medical speciality in facing and guiding this evolution in the next years.

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RESULTS OF CERTIFICATION PROCEDURES IN 25 YEARS

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The European Board of Physical and Rehabilitation Medicine (PRM) which was founded in 1991 offers different types of certifications:
1. Board certification of PRM specialists (Board Fellowship):
a. by examination, for PRM doctors and final-year trainees: MCQ examination based on the training curriculum published by the PRM Board.
b. by equivalence, for PRM specialists having practiced at least 10 years: assessment based on past and present PRM activities and publications.
Fellowship is valid for 10 years. To recertify PRM specialists must prove adherence to a continuous medical education program. After recertification Fellows become Senior Fellows and Senior Fellows become Life fellows.
2. Board certification of trainers: The candidate for certification must be a Board Fellow, recognized as a trainer by the national authorities and author of certain number of publications. Duration of certification is equal to the duration of the fellowship.
3. Board certification of training centers: A site visit is necessary for first certification. Recertification is necessary every 3 to 5 years, which might be awarded on file if no change has taken place since the first visit and if there is no concern about the quality of training.
Detailed information on the complete eligibility criteria and application procedures is available at www.europrm.org.
Since the foundation of the Board, 2663 PRM doctors were certified as fellows, among whom 262 were recertified as Senior Fellows & 2 as Life Fellows. As trainers 249 fellows were certified and 139 PRM departments were certified as training centres.

REHABILITATION OF INFLAMMATORY ARTHRITIS - CAN WE DO THE STEP UP?

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Major types of inflammatory arthritis are two distinctive diseases: rheumatoid arthritis (RA) and ankylosing spondylitis (AS). Centripetal pattern of joint affection starting from peripheral joints can be recognized in RA, contrary to AS where centrifugal pattern of joint affection can be seen. Long duration of disease contributes to limitations in functioning across all areas.
Persistent systemic inflammation, as distinctive attribute of most inflammatory arthritis, is involved in wide variety of clinical manifestations. Therefore, blocking inflammation is a headstone of main treatment strategies in rheumatology. According to ACR and ASAS/EULAR work groups, the optimal management of inflammatory arthritis requires a combination of nonpharmacological and pharmacological treatments. Biologic drugs, enabling early suppression of inflammation have brought a paradigm shift in the rehabilitation. Early suppression of inflammation and early detection of disease leads to prevention of severe joint deformities occurrence. Nevertheless, patients continue to have a reduced quality of life and this is why today emphasis should be placed on early non-pharmacological treatment focusing on dynamic and aerobic exercises. The importance of exercises is particularly prominent in countries where high unavailability of biological drugs is still present. Although in the past, exercise was not recommended to patients with rheumatic diseases for fear of aggravating inflammation the current evidence suggest that exercise have an anti¬inflammatory effect. New concept that skeletal muscle is secretory organ have emerged. With each bout of exercise muscle releases proteins called myokines such as IL 6 which induces production of IL 1 ra and IL 10 by blood mononuclear cells, thus having an anti-inflammatory effect.
Since there is emerging evidence on anti-inflammatory effect of exercise new research should define specific mode of delivery that would attain optimal anti-inflamatory effect. Prescribing exercises could soon become as routine as prescribing drugs, and at least as effective.

PROMOTING FUNCTION IN THE UPPER LIMB AFTER STROKE

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This presentation will deal with issue in early upper limb rehabilitation issues in survivors of stroke. It will focus on the assessment and management of the upper limb in order to capitalize on preserving function, where it is possible to achieve. The main factors interfering with patient functioning at this stage are pain, weakness, spasticity and pre-morbid problems with the upper limb. Middle-aged and elderly people often have musculoskeletal degeneration, which give rise to pain and loss of function and the subsequent neurological loss then leads to de-compensation them. The intervention of physical and pharmacological treatments allows pain relief and restoration of muscular activity and the use of nerve blocks, botulinum toxin and assistive technologies has advanced our understanding.
This presentation will discuss some of these interventions and will highlight on two aspects, in particular; the reduction of pain and restricted movement in the shoulder and the evidence for functional goal attainment in post-stroke spasticity. The presentation will report on the results of studies of real time management of post-stroke spasticity (PSS), such as the BOTOXâ Economic Spasticity Trial (BEST)1.
It will also propose a treatment pathway for post-stroke upper limb rehabilitation.
Reference: Ward AB, Wissel J, Borg J, Ertzgaard P, et al. Functional goal achievement in post-stroke spasticity patients: The BOTOX Economic Spasticity Trial (BEST). J Rehabil Med 2014; 46 (5): 504-513.

CARE PATHWAYS FOR PEOPLE FOLLOWING TRAUMATIC BRAIN INJURY

Ward Anthony

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The success of patient outcomes following rehabilitation depend on the clinical status of the patient presenting to treatment, the motivation and attitude of the patient, the skills of the treating team and the availability of appropriate facilities to implement a rehabilitation strategy. The patient's own attributes are again dependent on his or her pre-morbid state, the severity of the injury and the delivery of rapid and appropriate intensive care and resuscitation to prevent secondary brain injuries and other complications. The ability to prognosticate survival and independence at six months is now possible and prognostic modelling in traumatic brain injury is now possible1. Although the CRASH Trial collaborators1 and IMPACT database2 have both designed systems of care in the acute phase following injury to the brain and made assumptions about prognostication of independence at six months, little success was seen in improving outcomes, partly because of a lack of suitable rehabilitation activities to move the patient on in specialised rehabilitation facilities out of specialist inpatient settings. A new system for trauma rehabilitation with particular reference to brain injury rehabilitation has been established in England and Wales and has placed rehabilitation at the heart of the whole care pathway. Rehabilitation physicians are now key players from the very start of the patent's journey and create a rehabilitation plan for the patient from the critical care setting right through post-acute rehabilitation and out in to the patient's return to the community3.
The specialised rehabilitation team in Stoke on Trent is one of four Level 1 services in the West Midlands of England and is a major player in establishing this pathway. This presentation will describe the evidence necessary for developing a care pathway and the results of a study in which the outcomes of brain injured patients were improved by PRM interventions in the acute phase. It will also highlight our experience in a recent assessment of the pathway set up in Stoke on Trent.
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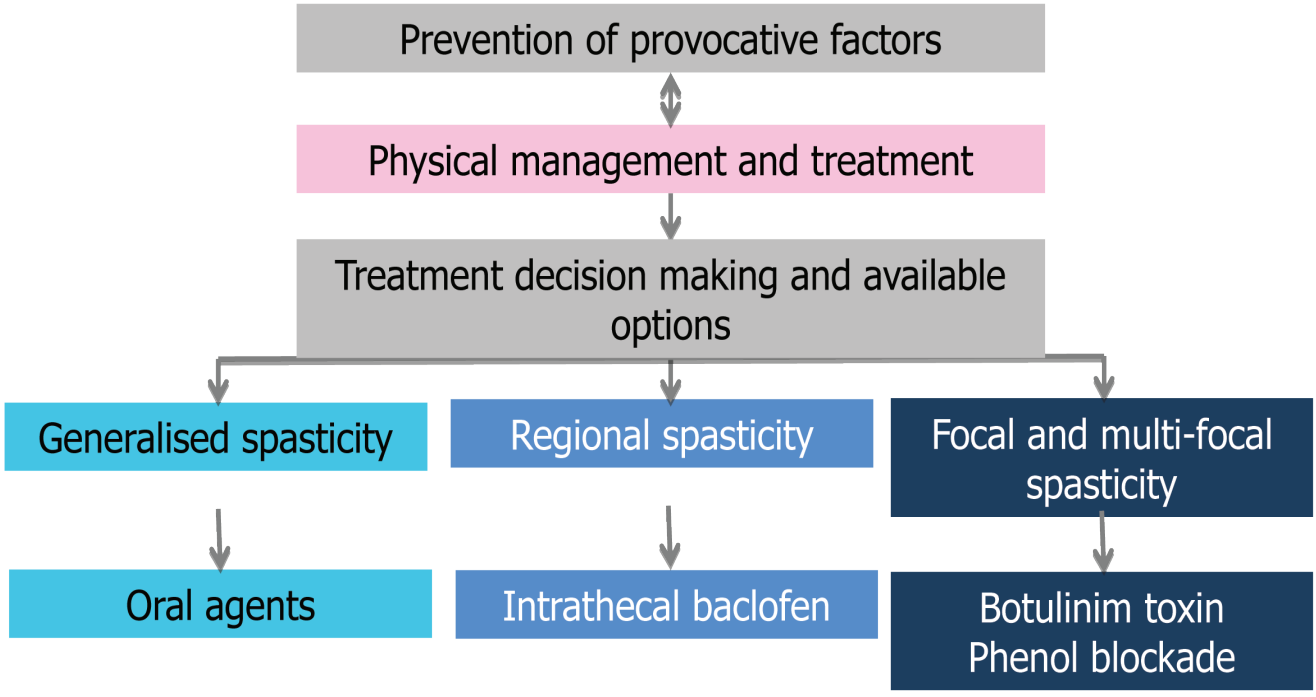
MEET THE EXPERTS - MANAGEMENT OF SPASTICITY

Ward Anthony

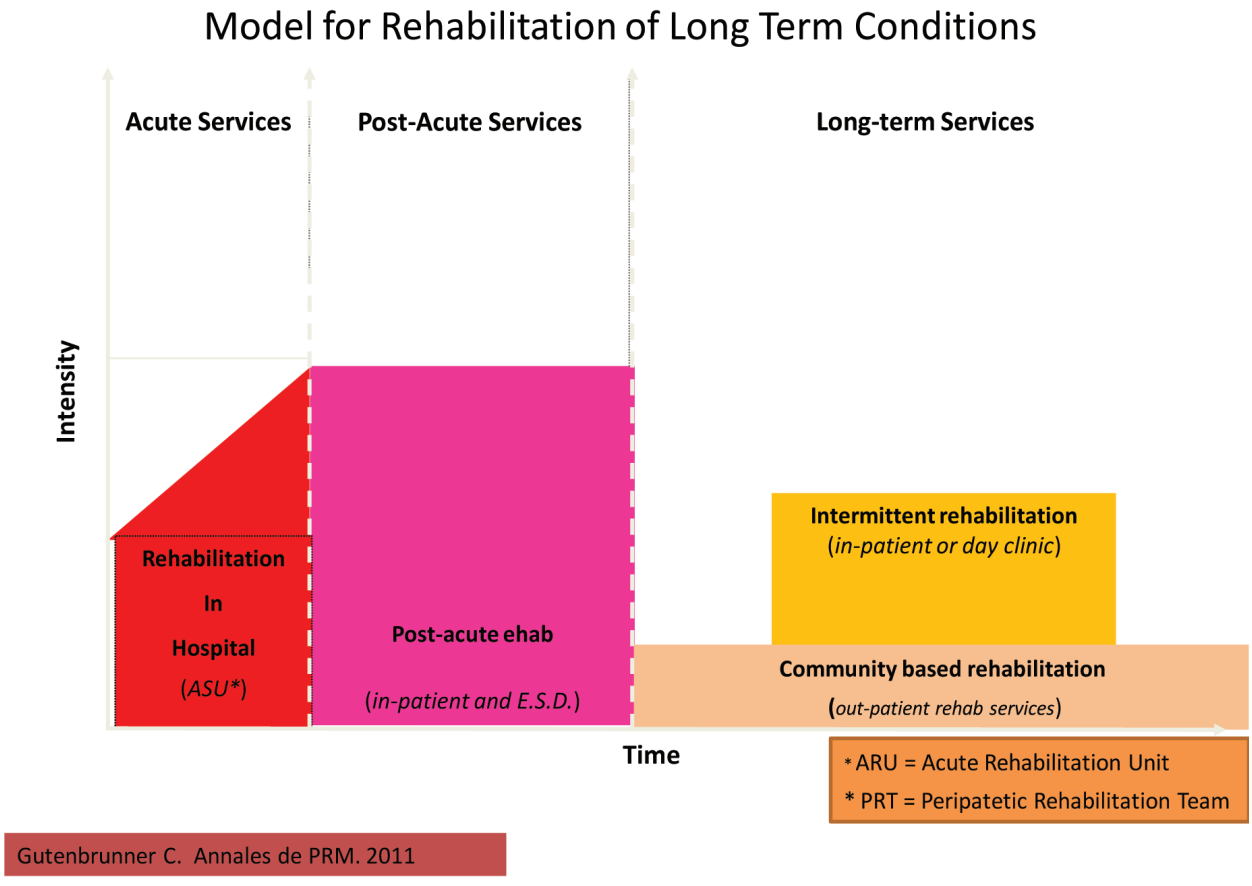
Staffordshire University
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Market Drayton, United Kingdom

Meet The Experts - Management of Spasticity
Chairman: Professor Anthony B Ward (UK)
Experts: Professor Thierry Deltombe (B)
Professor Franco Molteni (I)
Professor Mauro Zampolini (I)

This session will examine the modern and comprehensive management of spasticity. This is not just about botulinum toxin type A (BoNT-A), but about providing a comprehensive approach to patient care. The basis of treatment is physical, such as specific exercise, physical and occupational therapy, including specialised interventions, e.g. splinting/casting, functional electrical stimulation, mirror therapy, constraint-induced movement therapy (CIMT), etc. Of course, BoNT-A will be discussed along with other pharmacological interventions, but they are an adjunct to physical management. Clear goals for treatment are required, whether BoNT-A is used early in long-term management. The strategy below describes the pathway.



It is necessary to understand that treatment will have to continue over a prolonged period for some patients and that developing a network of interested clinicians in primary and secondary care is vital. The inclusion of surgeons in this strategy is also important and their value will be highlighted in the session.
This will be demonstrated by the experts, who will teach using videos of patients under their care. These will point out the necessary clues to make an accurate assessment, upon which to base a treatment programme thereafter. There is a clear need for objective goals for treatment, particularly in people with long term spasticity and this session will hold an open forum to discuss these for the patients shown.



WHAT PAIN TREATMENT FOR SCI: THE PAIN MEDICINE PERSPECTIVE

Wells Chris

Pain Matters
Liverpool, United Kingdom

Spinal Cord Injury pain presents a challenge to clinicians. Pain may be of mixed origins and there is often significant psychological distress. The presentation will focus on general principles, the evidence based treatments available, those with promise in the future, and also discuss prevention.

TELEREHABILITATION = TELEMEDICINE IN PRM

Wever Daniel,[1] Vollenbroek M., Hermens H.

[1]Outdoor Clinic
Rehabilitation Centre Roessingh
Enschede, Netherlands

Telemedicine developed rapidly in all specialties in the past decade. In physical and rehabilitation medicine (PRM) as well. We call it telerehabilitation. We are moving towards a digital society. There are already more than one billion websites, 400 million daily tweets and 3 billion likes. In healthcare there will also be many changes in the coming years. Apps, online platforms and other smart e-health solutions; they shoot like mushrooms from the ground, They all promise to make life easier for patients and care professionals with more fun. Improving quality of care and affordability of care will be the challenge. Especially with aging health care costs are increasing. Telerehabilitation can contribute to efficient, effective and quality care.
A shift of "one-size-fits-all" to "personalized health" will take place. Personalized health means health for the person in his or her environment and taking account of personal goals. That is also an important principle in PRM. A biopsychosocial approach is in telerehabilitation the gold standard. This is described in detail in the methodology of ICF (International Classification of functions). A reactive approach has to change into a proactive one, such as healthy lifestyle and so on. Initially telerehabilitation involved information for patients on the Internet. Gradually there were more applications. The main applications today are: teleconsultation, activity coaching, health monitoring and web-based exercising. The development and application of these telerehabilitation topics are discussed in this lecture. In the future care professionals will be given time and space to learn the ins and outs of telerehabilitation.

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SPORT SPECIFIC REHABILITATION AFTER SEVERE KNEE INJURIES IN ATHLETES

Wicker Anton

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In injured high level athletes the time to come back to competition and training is always too short.
To be able to bring the best efficiency in the rehabilitation process it is necessary to offer a special adapted sport-specific rehabilitation process.
The following three aspects in this process should be in harmony with each other:
The injured structure of the body should be given specific treatment.
Attention should be given to the position of the injured anatomic structure in the chain of motion pertaining to the specific type of sport. Moreover, regulation of motion and the sensomotor system should be given attention 3. It should be ensure, that the athlete`s stamina is not oberly impaired, especially in terms of strength, speed and endurance. A training program specifically designed to maintain the athlete`s stamina should be pursued, as far as possible, even the athlete is affected by the injury.
The treatment of complex mobility disorders, such as those encountered after knee surgery, necessitates the application of educational and scientific training principles to a much greater extent than has been done so far, especially if the injured person is an elite athlete.
A rehabilitation program for a ski racer or other elite athletes should be based on the principles of training and motion. The program should include exercises, training instructions and corrective measures, specially adapted to the sport and specific injury.

EARLY PHYSICAL THERAPY AFTER STROKE

Yelnik Alain

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Paris, France

In the early stage after stroke, ie within the 2 first weeks, roughly during the intensive stroke unit period, one of the crucial issue is the amount of physical therapy to be provided to a patient. This period could be crucial for neural plasticity stimulation but too early intensive exercises could also aggravate the ischemia. To prevent immobility related events, early mobilization has been proven to be effective, but a great amount of such mobilization can have a negative impact (Bernhardt 2015). Early mobilization is different than intensive rehabilitation. The last one is needed to stimulate neuronal plasticity and many studies have provided evidence of its usefulness at the sub-acute stage after stroke. At the early stage very few studies investigated this issue and their results do not encourage recommending intensive activity. Our recent study conducted among 103 patients clearly shows that intensive physical activity is not superior to a basic one devoted to prevent immobility related events, especially in patients with moderate to severe stroke. It seems now possible to draw recommendations for physical activity early after stroke.

ENHANCING THE QUALITY AND TRANSPARENCY OF PRM RESEARCH: THE REPORTING GUIDELINES

Zampolini Mauro

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Foligno, Italy

In order to improve the quality of disability and rehabilitation research reports must contain sufficient information to allow readers to understand how a study was designed and carried out, including variable definitions, tools and other measures, and analysis of the techniques. Reporting guidelines are documents that help authors to report their research methods and findings. They are typically organized as checklists or flow diagrams that define the core reporting criteria required to give a clear account of a study's methods and results. The aim is to ensure their manuscripts contain key elements. Reporting guidelines should not be considered as an administrative burden, but rather a template by which an author can construct their papers more completely.
For review articles, both systematic and narrative, readers should be informed of the rationale and details about the literature search strategy. Too often, articles fail to include their standard for inclusion and their criteria for evaluating quality of the studies.
The EQUATOR Network is an important organization that promotes the quality of reporting Examples are:
• CONSORT for randomized controlled trials.
• STARD for studies of diagnostic accuracy (www.stard-statement.org).
• CARE for case reports (www.care-statement.org/).
• STROBE for observational studies.
• PRISMA for systematic reviews and meta-analyses (www.prisma-statement.org).

The simultaneous implementations of this new reporting requirement give a strong message to all rehabilitation researchers of the need to adhere to the highest standards when performing and disseminating research
In conclusion, reporting guidelines also permit high transparency level in reporting how studies were carried out and can help, hopefully during the peer review process, to standardize the quality of the papers.

QUALITY MANAGEMENT PROGRAMS: THE UEMS PRM SECTION EFFORT TO ESTABLISH NATIONAL DATABASES AND CLINICAL ASSESSMENT SCHEDULES ICF-BASED STANDARDIZED REPORTING OF CURRENT AND WIDELY USED DATA COLLECTION TOOLS

Zampolini Mauro

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Umbria Regional Public Health Service
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The Section of Physical and Rehabilitation Medicine represent specialists in Physical and Rehabilitation Medicine (PRM) within the European Union of Medical Specialists (UEMS).
The section is designed to develop professional competences of PRM doctor, promote quality of PRM activity and define the standard in rehabilitation.
The ICF is a core conceptual framework of PRM. It can explain the field of action of Rehabilitation Medicine aimed to promote the functioning of the person.
For this reason, the UEMS-PRM section intends to promote it.
A primary level of the use of ICF is a shared language and taxonomy. It is important to identify the problem that leads to disability and use the definition to standardize the name of the problem and identify the rehabilitation goals inside the rehabilitation programs.
A further step is to use ICF as an assessment tool. The classification standardizes specific qualifier that rates the severity of the problem. The limit of this standardization is that is not yet validated. In order to achieve a standardization of the rating of the qualifiers, numerous studies have been carried out. In some studies, the Rasch analysis has been used to obtain a linearization of the severity score of the qualifiers. A second trend of the studies is to translate the score of the scales usually used in rehabilitation and obtain a standardized score using the qualifiers. In this way, the ICF could be used for the outcome measures and quality management in rehabilitation.
In the next few years, gradually the UEMS Section and Board would like to promote a strategy to be implemented in the everyday practical activity.

ESPRM GUIDELINES COMMITTEE SESSION - PRM EUROPEAN GUIDELINES: BUILDING GOOD PRACTICE. WHAT DO WE ACHIEVED AND WHAT WE WILL GET MORE

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The ESPRM has started a project to collect and promote Clinical Guidelines in rehabilitation, in collaboration with UEMS PRM Section and Board. The need of the ESPRM was to promote the scientific value of Clinical Guidelines in rehabilitation and guarantee their quality. The UEMS-PRM Section and Board have an interest to use the recommendation coming from the guidelines to address the quality of the rehabilitation program. In fact, in this organization the clinical affairs committee promotes the accreditation of the rehabilitation program in term of evidence based practice.
A first action has been a survey aimed to collect the rehabilitation guidelines developed in the European countries. Most of them are not only for rehabilitation but often developed for specific pathologies and containing inside some recommendation about rehabilitation. Several of them are in the local language and not easly spreadable. The second step is to collect recommendation starting from existing guidelines and assess the quality with AGREE II checklist, an international tool to assess the quality and reporting of practice guidelines.
The topic without evidences will be assessed through a Delphi process that will involve the European scientist working in rehabilitation, known rehabilitation leaders on the chosen topic, as well as representatives of the committees that produced the already existing national Guidelines. A strong synergy could be found with the Cochrane PRM field chaired from Stefano Negrini, aimed to collect evidences in the rehabilitation field, and the developing of the position papers in PRM developed inside the UEMS Section and Board.
The use and implementation of the Rehabilitation Guidelines in Europe will be more and more a cooperative action between European Society of PRM and UEMS Section and Board.

TIME COURSE OF FUNCTIONAL RECOVERY DURING THE FIRST YEAR OF TBI: AN EPIDEMIOLOGICAL STUDY

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The Sabiur (Severe Acquired Brain Injury in Umbria Region) is a study on the incidence and prognosis of severe brain injury in the Umbria Region. We included both traumatic and non-traumatic brain injury.
The main objective of this study is to calculate the incidence in a year of severe brain injury in the Region of Umbria, including all new cases admitted to hospitals in the region with the scores at or below 8 to the Glasgow Coma Scale with secondary objective of evaluating the paths and outcomes through follow-up of one year.
In one year, we included 333 patients. The regional incidence rate is subsequently 37.7 cerebral lesions acquired for 100,000 residents (95% CI: 33.9-42.0).
205 patients (62%) passed away which 102 in the first 4 days. Survival in the first four days is thus equal to 69%, in the six months to 40% and at the end of the 12 months of observation to 38%. After the first few months have witnessed a rapid fall in the mortality rate
The traumatic etiology in patients have a higher probability of survival in fact one year those traumatic etiology have a survival probability of 50% (95% CI 39% -64%) while in this probability is 36% non-traumatic (95 % CI 30% -42%).
The incidence rate of the vegetative and minimally conscious states one month of admission stood at 5.1 per 100,000 residents (95% CI 3.8-6.8). At 6 months and 12 months, the rate was, respectively, 1.2 (95% CI 0.7-2.2) and 0.8 (95% CI 0.4-1.7).
In this study, we showed the feasibility of a real epidemiological study focused on the incidence of sABI but also looking at the functional recovery over 1 year.

DEVELOPING RESEARCH AIMING AT EFFICACY/EFFECTIVENESS BY TREATMENTS INTEGRATION AND COMBINATION

Zutter Daniel

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Rehaklinik Zihlschlacht (Vamed)
Zihlschlacht, Switzerland

Like in many other areas of our modern time technology also influences neurorehabilitation. However the uses of these new technologies arises many new questions how to integrate them into well-established therapeutic programs.
Beside their proof of efficacy for different neurological indications there is also a need to evaluate their economic aspects. In this presentation we will show possible practical solutions how robotic assisted therapies can be used in combination with standard therapies.
Furthermore we will discuss the national Swiss Rehatech Initiative which is a collaboration of industrial companies, clinical institutions, health care economists and politicians.

ORAL PRESENTATIONS

OP001
AEROBIC CAPACITY AND WALKING PERFORMANCE AFTER AEROBIC TRAINING IN SUB-ACUTE STAGE AFTER STROKE

Erjavec Tatjana, Vidmar Gaj, Goljar Nika

University Rehabilitation Institute Republic of Slovenia

The aim of the study was to determine if individually prescribed aerobic training, based on stress testing, improves cardiovascular and walking performance of patients in the subacute period after stroke
Material and Methods 40 stroke patients admitted to comprehensive inpatient stroke rehabilitation program were randomized in two treatment groups; control group without (20 patients average age 50,8 years) and test group (20 patients average age 51,4 years) with individualy prescribed aerobic training with regard to the result of the stress testing. The aerobic training was performed on exercise bike five times a week, 15 minuts once or twice a day, 20 times. The initial training intensity was begun at 60 % of achived peak heart rate (HR) on stress testing and was progressively increased to 70% of achived peak HR. All patients were included also in standard stroke rehabilitation program. Ergospirometry, 6 minuts walk test (6MWT) and Stand up and Go test were performed at admission to rehabilitation and after twenty session of rehabilitation programs.
Results After training the oxygen consumption was higher for 2,6 ml/kg/min in test group and 1,4 ml/kg/min in control group in average. The walking distance during 6 MWT was longer for 90,7 m in test group and 40,3 m in control group in average. The time for performing Stand up and Go test was shorter for 3 s in test group and 2,5 s in control group. The results were not statistically significant.
Conclusions: In both group of patients the cardiovascular performance was improved. The results were better in test group but were not statistical significant. The main reason probably was too short time of training duration.

OP002
ACTIVE MOBILITY EARLY AFTER STROKE (AMOBES) A RANDOMISED CONTROLLED TRIAL.

Yelnik Alain[1], Andriantsifanetra Cedric[1], Reinert Peggy[2], Wanepain Marie[1], Beaudreuil Johann[1], Rousseau Helene[3], Vicaut Eric[4]

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Purpose: Active and intensive physical therapy (PT) has been proven to be efficient in motor control recovery when provided at a subacute stage (few weeks or months) after stroke. Very few studies investigated the role of intensive PT in the acute stage, within the 2 first weeks. This period could be crucial for neural plasticity stimulation but too early intensive exercises could also aggravate the ischemia.
Methods and tools: This multicentre randomized controlled trial has been designed to compare "soft" (20mn/day apart from respiratory needs) versus "intensive" (id + 45 minutes of intensive exercises) physical therapy, initiated within the 72 first hours after a first hemispheric stroke. Blind assessment has been made on the motor control (Fugl Meyer at day 90 as main criteria), length of hospital stay, autonomy (Rankin and Functional Independence Measurement), quality of life (Stroke Impact Scale), unexpected medical events. Setting: 9 stroke units with PRM team.
Results: 103 among the 104 included patients could be analysed, 64 males, 67 right hemispheric lesions, 80 ischemic lesions, NIHSS <8 = 19, 8-15 = 42, >15 = 42; control group/experimental group 52/51, age 66.2 ± 13/67.2 ± 11. No difference between groups was observed according to the main criteria, neither at day 30 nor 45.
Discussion and conclusion: at the early stage after stroke, intensive physical therapy does not seem to be more effective on motor control recovery than a soft PT preventing immobility related complications.

OP003
THE INFLUENCE OF FUNCTIONAL, SOCIAL AND PERSONAL FACTORS ON THE LEVEL OF SELF-PERCEIVED DISABILITY FOR PERSONS LIVING IN LATVIA

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Introduction. The consequences of stroke can vary greatly and often leads to long-term disability that, according to WHO definitions, depends on the interaction between the person and his/her context.
The purpose of this study was to investigate how functional, social and personal factors influence the self-perceived level of disability in the chronic phase of stroke in a Latvian stroke population.
Methods. This is a cross-sectional study with retrospective data gathering. The convenience sample of 255 community dwelling persons who received specialized in-patient rehabilitation after stroke was used. The medical information and discharge data of the Functional Independence Measure (FIM) was extracted from medical records. Participants filled out a questionnaire on socio-demographic information and the WHO Disability Assessment Schedule 2.0 (WHODAS 2.0), either in Latvian or Russian depending on their wishes when contacted for their oral agreement to participate. Stepwise multiple regression analysis was conducted to find a model that best explains the variance in WHODAS 2.0 scores.
Results. The models explained 23-43.5 % of variance in outcomes. Best explained WHODAS 2.0 domains were 'Mobility' and 'Self-care'. The significant factors were level of independence in 'Self-care', 'Locomotion' and 'Communication' according to FIM, as well as working status, time since rehabilitation, age, gender, living alone or in family and preferred language.
Conclusions. Functional, social and personal factors are of similar importance when explaining self-perceived disability in the chronic phase of stroke. Some, but not all, of the factors are modifiable by the health care system. Therefore, a complex approach and involvement of medical, social and political systems is needed.

OP004
THE EFFECTS OF THE VIRTUAL REALITY ON UPPER EXTREMITY FUNCTIONS IN STROKE PATIENTS

Mirzayev Ilkin[1], Yilmaz Emine Ece[2], Afsar Sevgi Ikbali[3], Yemisci Oya Umit[2], Nalbant Merve[2], Karatas Metin[2]

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Introduction: Stroke rehabilitation need to develop new approaches in order to help individuals gain higher level of functional independence. These include activating brain plasticity and reorganization of neural system. Virtual Reality (VR) game system is one of these novel approaches, that can improve hemiplegic extremity functions of stroke patients. The aim of our study is to evaluate the effect of the Microsoft Xbox 360 Kinect™ video game system on upper limb motor functions for subacute stroke patients.
Method: The participants of this study are 42 stroke patients (21 VR group, 21 Control group). Totally 35 patients (19 VR group, 16 Control group) have completed the study. All patients received 60-120 minutes of conventional stroke rehabilitation program for upper extremity, 5 times per week for 4 weeks. VR group patients additionally received Xbox 360 Kinect™ video game system 30-60 minutes per day. Patients were evaluated prior to the rehabilitation and at the end of 4 weeks. Box&Block Test (BBT), Functional independence measure self care score (FIM), Brunnstorm Recovery Stage (BRS) and Fugl-Meyer upper extremity motor function scale were used as outcome measurements.
Results: BMS, BBT and FM scale values of VR group were significantly higher compared to control group ($p<0.001$).
Discussion and Conclusions: In conclusion, it was determined that Xbox 360 Kinect™ VR video game system in addition to conventional therapy in upper extremity rehabilitation has supplemental benefit for stroke patients. However, for VR video game systems to enter the routine practice of the stroke rehabilitation, randomized controlled clinical trials with longer follow-up periods are needed especially to determine an optimal duration and intensity of the treatment.

OP005
EFFICACY OF BALANCE TRAINING WITH NINTENDO WII IN STROKE PATIENTS: A RANDOMIZED- CONTROLLED TRIAL

Sipos Zsanett

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Department of Pediatric Rehabilitattion, the Bethesda Children Hospital of the Hungarian Reformed Church 1146 Bethesda street 3, Budapest Hungary

Introduction: Recovery of stroke patients depends on the capacity of neural plasticity. Data from earlier studies showed that stroke patients generally perform a very limited number of movement repetition in traditional therapy sessions. Virtual Reality (VR) provide an opportunity to increase the number of movement repetition in therapy sessions. Previous research and reviews found no definitive conclusions regarding balance. The aim of this randomized controlled trial was to compare VR treapy to conventional balance treatment (CBT) in hemiparetic stroke patients.
Method: Twenty one hemiparetic stroke patients were randomly assigned to control and wii groups. Before and after the therapy programme every participant completed Fugl-Meyer balance subtest (FMBS), Functional Ambulation Categories (FAC), Romberg (R), sharpened Romberg (SR), one-legged stance (OLS), six-meter walking test (6MWT).
Results: At the baseline there were no significant differences between groups. The intragroup analysis showed significant improvement for FAC z= 0.0267, FMBS z= 0.0046, OLST2 z= 0.0068 and OLS1 z= 0.0067 in the Wii goup. Although the analysis showed no significant difference between groups, the change was higher in the Wii goup for FMBS and OLST1. Both groups demonstrated improvement in 6MWT. The analysis found that Wii Fit training and conventional balance therapy were similar in improving walking distance.
Discussion and conclusions: Wii Fit gaming was effective on functional (FMBS) and static balance (OLST1) improvements and showed meaningful improvement in walking ability (FAC) in patients affected by stroke. Both groups showed similar significant improvement in functional mobility (6MWT). Findings of this recent study support that balance treatment with Nintendo Wii™ is an alternative and effective method to improve balance and functional mobility.

OP006
TRENDS OF ISCHEMIC STROKE INCIDENCE AMONG THE JEWISH AND BEDOUIN POPULATION IN THE NEGEV

Treger Iuly[1], Dizitzer Yotam[2,3], Oxman Liat[2,3], Yitshak - Sade Maayan[2], Novack Victor[3], Horev Anat[4], Abu Salameh Ibrahim[4], Lutsky Lena[5], Ifergane Gal[4]

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Introduction: "The Negev" is inhabited by two dominant ethnic groups: Jews and Bedouins. The Bedouins are ongoing modernization while maintaining characteristics of a third-world population.
Purpose: To evaluate the incidence of ischemic stroke (IS) in both localities in the Negev and assesse incidence trends in two dominant populations.
Method: We identified all "Clalit" members, hospitalized with IS in Soroka Medical Center between 2006-2012. We calculated annual incidence rates in each locality, stratified by age groups (18-34, 35-64, ≥65). To test annual trends we assessed the association between the year of study and the incidence rate using Generalized Estimating Equation models, in each ethnic group, adjusted for gender.
Results We identified 7,257 cases. Of whom, 1,405(19%) were of Bedouin settlements. In people≥65, the median incidence rate (per 10,000 people) was higher among Bedouins, compared to Jews (238 vs. 229, respectively). In the ages of 34-64, rates were lower among Bedouins (22 vs. 34, respectively). Rates in the youngest group were similar (0.54 vs. 0.49, respectively). The trend of decreasing risk of IS in the older age groups was similar in both populations (Relative Risk (RR) and [95% Confidence Interval (CI)]: 0.93 [0.89;0.98] and 0.96 [0.95;0.96] in Bedouins and Jews aged 34-64; 0.94 [0.88;1.00] and 0.95 [0.93;0.96] in Bedouins and Jews aged ≥65. In the youngest group we observed an increasing trend both in Bedouins (RR 1.30, 95%CI 1.15;1.46) and Jews (RR 1.33, 95%CI 1.15;1.56).
Discussion and conclusions: Similar to the global trends, we observed a decrease in IS incidence in older groups alongside an increasing trend in the young. Despite characteristics of a third-world, the trends among the Bedouins were similar to the Jewish population, suggesting the effectiveness of prevention programs. The detected data is important for development of neurological and rehabilitation care, both inpatient and outpatient, in the region.

OP007
LAY - LOOK AFTER YOURSELF - THERAPEUTIC PATIENT EDUCATION IN EARLY POST-STROKE REHABILITATION: DEFINING USUAL CARE AND PRELIMINARY DATA

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Introduction: Guidelines recommend Therapeutic Patient Education (TPE) to empower self-management and facilitate social reintegration in stroke patients, but there are no strong evidences of efficacy because of variability in type, timing and setting of programs.
Purpose: To define what is usual care in stroke rehabilitation and to develop and evaluate a standardized TPE program for post-acute stroke patients.
Method: Design: controlled clinical trial, 3 rehabilitation centers: S.Orsola (BO), Reggio Emilia (RE), Baggiovara (MO). Patients: Usual care: 10+10 RE, MO; 20 BO. Intervention: 120 intervention group (RE, MO); 120 control group (BO). Inclusion criteria: first stroke, >18 years, presence of a caregiver, moderate-severe disability (MBI-Modified Barthel Index<70), no severe communication disability and cognitive impairment (MMSE-Mini Mental State Evaluation>15). Primary outcome: patient perceived self efficacy (SSEQ-Stroke Self Efficacy Questionnaire) Assessment: T0 (enrollment), T1 (discharge), T2 (50-60 days after discharge): SSEQ, MBI, Short Physical Performance Battery, Geriatric Depression Scale, SF-12, patient and caregiver's satisfaction, Caregiver Strain Index. At T2 also: % of homecoming, lenght of stay, territorial services use.
Results: Researchers collected Usual Care datas to define the 3 centres homogeneity and set up the intervention for patients and caregivers (6 group sessions, 3 individual, directed by rehabilitation specialists) adapting the Stanford Chronic Disease Self Management Program. The focus is the training on the goal setting and problem solving. Topics: stroke, risk factors, rehabilitation, self-management, emotions, good communication and help request, sleep quality, drugs management, pain, fatigue, nutrition, falls prevention, exercise. Usual care datas showed a T0-T1 significant increasing in SSEQ, SPPB, SF12 with no differences between the centers. We'll also report program application, compliance and preliminary data.
Discussion and conclusions: This study will evalutate what is usual care in stroke rehabilitation and will standardize a TPE program for stroke patients in post-acute phase, to empower self-management of long-term disability.

OP008
PREDICTORS OF EFFICACY AND UTILITY OF GAIT, AFTER INPATIENT REHABILITATION IN STROKE SURVIVORS

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Introduction: After a stroke gait recovery is a major challenge in rehabilitation.
Purpose: To evaluate if the Functional Independence Measurement (FIM), Berg Balance Scale (BBS) and Functional Ambulatory Categories (FAC) at admission in an inpatient rehabilitation program can be prognostic predictors of ambulation independence in a cohort of stroke survivors.
Materials and methods: Data from 119 stroke patients in their first inpatient rehabilitation period in an adult neuro-rehabilitation service during 2014. Data were prospectively collected in a custom designed instrument at the beginning and end of the inpatient rehabilitation program and were retrospectively analyzed. Total FIM, BBS and FAC at admission were correlated to FIM walk score, FAC, gait velocity (10 meter walk test) and 6 minutes walk test, at discharge.
Results: We included 119 patients. Stroke occurred at a mean age of 63 years, 30.25% in young age (<55years) and 20.17% aged 75 and above. 56.3% were female. The most frequent mechanism was ischemia (72.3%) and the right hemisphere was affected in 46.6%. Impairment was left hemiparesis in 50.42% and right hemiparesis in 42.02% of patients. Mean interval between stroke and admission was 77 days and length of stay was 67 days. Mean FIM improved from 65.76 at admission to 83.43 at discharge, with a change of 18% ($p<0.001$). Higher mean total FIM scores, BBS and FAC at admission positively correlated with better results upon discharge, in gait velocity and 6-minute walk test (efficacy and efficiency/utility of gait), $p<0.001$.
Discussion and conclusions: In our cohort of 119 stroke survivors the outcome measures routinely used by the multidisciplinary team allow us to expect that patients with better FIM global and locomotion scores, better BBS and FAC scores on admission are more likely to have better results in gait autonomy, efficacy and utility, after their first inpatient rehabilitation period.

OP009
EFFECT OF SIX MONTHS OF COMBINED PHYSICAL ACTIVITY INCITATION AND THERAPEUTIC PATIENT EDUCATION AT HOME IN STROKE PATIENTS

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Introduction: In France, there are 150,000 new stroke cases every year. (De Perreti. 2012) Therapeutic Patient Education (TPE) and Physical Activity (PA) are two successful approaches in reducing the recurrence of total, ischemic, and hemorrhagic strokes. (Lee. 2003)
Purpose: The aim of the study was to evaluate the effect of TPE and the incitement of PA at home on functional capacity, fatigue and depression parameters in stroke patients.
Method: 36 post-ischemic and hemorrhagic stroke patients (mean ± SD; Age: 59 ± 13 years; Height: 169.6 ± 9.4 cm; Weight: 75 ± 15 Kg; Issue post-stroke: 79 ± 48 days, blood pressure 135 ± 14 / 80 ± 8 mm/hg) volunteered to participate in this randomized experimental study. The patients were divided into two groups: experimental group (PA+TPE) vs. control group (TT). The patients were evaluated on the basis of 6- Minute Walk Test (6MWT), quadriceps muscle strength, body composition, Hospital Anxiety Depression Scale (HADS) and the Multidimensional Fatigue Inventory questionnaire (MFI-20) at baseline (T0) and after six months (T1). To control the daily PA recommendations, one body monitoring device was used during the daytime at home.
Results: The distance (m) in 6MWT followed by PA+TPE and TT group at T0 and T1 were (384± 143; 453±142) and (358±148; 383±151) respectively. The distance achieved during 6MWT significantly increased in PA+TPE group than TT group ($p<0.01$) at T1. No effects of therapeutic care were observed for quadriceps muscle strength, body composition, HADS and MFI-20 in either group.
Discussion and conclusions: TPE and incitation of PA at home improve the walking distance and keep the physical activity recommendations. We assume that this result reduces the likelihood of a stroke relapse.

OP010
MOTOR RECOVERY IN LOWER LIMB IS BETTER THAN IN UPPER LIMB IN PATIENTS AFFECTED BY STROKE: A PROSPECTIVE COHORT STUDY

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Introduction: Stroke is a main cause of acquired disability in high-income countries because of its impairment in muscle movement and mobility. Recovery of upper and lower limb function is a complex process that requires an adequate rehabilitation.
Purpose: The aim of our prospective cohort study was to analyze the influence of a rehabilitative treatment on motor recovery in a population of adults after stroke, comparing motor recovery of upper and lower extremities.
Method: We included adults (aged > 18 years) at their first hospitalization after stroke from March 2015 to August 2015. All these patients underwent a specific rehabilitative treatment to recover motor function. We assessed at the baseline (T_0) and at the end of their intensive rehabilitative program (T_1) the following outcomes: Motricity Index (MI), Trunk Control Test (TCT), Arm Functional Test (AFT), Ashworth Scale (AS), Short Portable Mental Status Questionnaire (SPMSQ), Barthel Index (BI), Modified Barthel Index (mBI), Modified Ranking Scale (mRS), Functional Ambulation Classification (FAC), and Sitting Balance Scale (SBS).
Results: We assessed 36 patients (20 female and 16 male), mean aged 68.72 ± 9.33 years, with a mean BMI of 23,32 ± 2,96 kg/m^2. There were statistically significant improvements both in upper extremity MI (27.83 ± 25.93 at T_0 vs 42.77 ± 25.21 at T_1; $p < 0.0001$) and lower extremity MI (33.05 ± 24.79 vs 61.08 ± 21.18; $p < 0.0001$); moreover we compared upper and lower extremity MI at the baseline ($p = 0.0311$) and at T_1 ($p < 0.0001$).
Discussion and conclusions: Our results showed that the rehabilitative treatment received by our patients was able to improve motor recovery in both extremities, but there was a higher improvement in the motor recovery of lower limb. Furthermore, there were significant improvements in all the secondary outcomes evaluated, except for muscle tone.

OP011
BASELINE DEMOGRAPHICS AND CLINICAL CHARACTERISTICS OF PATIENTS TREATED WITH ONABOTULINUMTOXINA FOR SPASTICITY IN THE ADULT SPASTICITY INTERNATIONAL REGISTRY ON BOTOX® TREATMENT (ASPIRE) STUDY

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Introduction: OnabotulinumtoxinA treatment for patients with spasticity is individualized, variable, and dependent on numerous factors, many of which are related to disease and burden characteristics.
Purpose: To describe baseline demographics and clinical characteristics in patients treated with onabotulinumtoxinA for spasticity.
Methods: This is a multicenter, prospective registry conducted at select North America, Europe, and Asia sites (NCT01930786). Primary objectives were to assess treatment utilization, patient/physician treatment satisfaction, and botulinum toxin treatment incidence for other indications among adult patients treated with onabotulinumtoxinA for spasticity. Treatments were administered per routine care. Patients with spasticity of multiple etiologies, including those previously treated, were eligible. Enrollment was completed September 11, 2015. Baseline demographics and clinical characteristics as of September 10, 2015 are herein summarized.
Results: ASPIRE enrolled 727 patients treated by 63 healthcare providers (69.4% PM&R's) across France, Germany, Italy, Spain, Taiwan, UK, and USA (n=54 sites). More patients (n=602/715, 84.2%) presented with lower limb spasticity (most common presentations were equinovarus foot [35.2%] and extended knee [16.1%]), than upper limb spasticity (n=513/716, 71.2%; most common presentations were flexed elbow [22.4%] and clenched fist [21.5%]). At baseline, 36.8% (n=268) of patients were botulinum toxin naïve for spasticity treatment. Patients with spasticity due to stroke (58.1%), multiple sclerosis (15.7%), other etiologies (10.1%), cerebral palsy (9.8%), traumatic brain injury (5.9%), and spinal cord injury (5.4%), were on average 53.7 years old and primarily Caucasian (77.4%). Gender was nearly evenly distributed (52.1% female). Demographics were generally comparable across countries, except Taiwan.
Discussion and conclusions: Global epidemiological data for spasticity is lacking. ASPIRE represents the largest existing international database prospectively evaluating demographics and clinical characteristics of spasticity across multiple etiologies. Further baseline analyses will describe onabotulinumtoxinA utilization patterns, treatment satisfaction, individual and caregiver burden associated with spasticity, and characterize the healthcare provider population treating spasticity.

OP012
ESCALATING DOSES OF INCOBOTULINUMTOXINA (XEOMIN; 400U-800U) LEAD TO INCREASING GOAL ATTAINMENT AND DECREASE THE BURDEN OF MULTIFOCAL UPPER- AND LOWER-LIMB SPASTICITY

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Introduction: Patients with severe multifocal spasticity may benefit from botulinum toxin treatment at higher doses than generally used.
Purpose: To report the efficacy of increasing incobotulinumtoxinA (Xeomin, Merz Pharmaceuticals GmbH) doses (400U-800U) for patients with spasticity.
Method: This prospective, dose-titration study (NCT01603459) enrolled patients (18-80 years) with spastic hemiparesis due to cerebral causes, deemed to require total doses of incobotulinumtoxinA 800U. Patients received 3 consecutive injection cycles (ICs) with incobotulinumtoxinA 400U, 600U and 600U-800U, respectively, each followed by 12-16 weeks' observation. Efficacy outcomes included: Ashworth Scale (AS), Resistance to Passive Movement Scale (REPAS), Goal Attainment Scale and Global Assessment of Efficacy (very good, good, moderate or poor).
Results: IncobotulinumtoxinA dose escalation allowed treatment of an increasing number of spasticity patterns. An AS response (≥1-point improvement to 4 weeks post-injection) was observed in 364/608 (59.9%) patterns treated in IC1 (n=155), 431/743 (58.0%) patterns in IC2 (n=152), and 537/811 (66.2%) patterns in IC3 (n=140). The mean±standard deviation change in REPAS score from each injection to 4 weeks post-injection increased throughout the study (IC1: -4.6±3.9; IC2: -5.9±4.2; IC3: -7.1±4.8; $p<0.0001$ for all). The proportion of patients achieving ≥3/4 treatment goals also increased (IC1: 25.2%; IC2: 50.7%; IC3: 68.6%). Dose escalation led to increased ratings of global efficacy of good/very good by investigators (IC1: 55.5%; IC2: 72.4%; IC3: 89.3%) and patients (IC1: 59.4%; IC2: 63.8%; IC3: 76.4%).
Discussion and conclusions: Escalating incobotulinumtoxinA doses (400U-800U) led to a decreased burden of spasticity, increased goal achievement and increased overall satisfaction (efficacy ratings) of patients and investigators.

OP013
IMPACT OF EARLY INTERVENTION WITH ONABOTULINUMTOXINA TREATMENT IN ADULT PATIENTS WITH POST-STROKE LOWER LIMB SPASTICITY

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Introduction: OnabotulinumtoxinA is approved by the US Food and Drug Administration for the treatment of post-stroke upper limb spasticity; efficacy in post-stroke lower limb spasticity (PSLLS) is being investigated.
Purpose: To evaluate the efficacy of onabotulinumtoxinA in PSLLS.
Method: A multicenter, phase 3, placebo-controlled study enrolled patients with PSLLS (Modified Ashworth Scale [MAS] ≥3) of the ankle. During the 12-week double-blind phase, patients were randomized to receive onabotulinumtoxinA (300U, mandatory muscles [gastrocnemius, soleus, tibialis posterior]; and ≤100U, optional lower limb muscles [flexor digitorum longus, flexor hallucis longus, flexor digitorum brevis, extensor hallucis, rectus femoris]) or placebo. The primary endpoint was MAS change from baseline average score of weeks 4 and 6. Secondary endpoints included physician-assessed Clinical Global Impression of Change (CGI) average score of weeks 4 and 6 and physician-assessed Goal Attainment Scale (GAS; active and passive at weeks 8 and 12).
Results: In the intent-to-treat population, (onabotulinumtoxinA, n=233; placebo, n=235), significant improvements vs. placebo were observed in MAS (–0.81 vs. –0.61; P=0.01), CGI (0.86 vs. 0.65; P=0.01), and passive GAS scores (week 12, –0.6 vs. –0.9; P=0.042). When stratified by time of treatment initiation since stroke (<24 months, n=153; >24 months, n=315), patients who were treated ≤24 months of stroke experienced greater improvements (mean difference from baseline vs. placebo) in MAS (–0.31 vs. –0.17), CGI (0.49 vs. 0.12), and passive GAS scores (week 12, 0.37 vs. 0.26). Among patients ≤24 months since stroke, a greater proportion achieved ≥1 point improvement in active (week 12; P=0.039) and passive (week 8; P=0.023) GAS scores compared with placebo. OnabotulinumtoxinA 300-400 U was well tolerated with no new safety findings.
Discussion and conclusions: OnabotulinumtoxinA 300U-400U is effective in improving MAS, CGI, and GAS scores in patients with PSLLS with greater benefits among those who initiate treatment ≤24 months post-stroke.
Study Supported By: Allergan, Inc.

OP014
PLASTIC CHANGES IN SPINAL SYNAPTIC TRANSMISSION FOLLOWING BOTULINUM TOXIN A IN PATIENTS WITH POST-STROKE SPASTICITY

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Objective: The therapeutic effects of intramuscular injections of botulinum toxin-type A on spasticity can largely be explained by its blocking action at the neuromuscular junction. Botulinum toxin-type A is also thought to have a central action on the functional organization of the central nervous system. This study assessed the action of botulinum toxintype A on spinal motor networks by investigating post-activation depression of the soleus H-reflex in post-stroke patients. Post-activation depression, a presynaptic mechanism controlling the synaptic efficacy of Ia-motoneuron transmission, is involved in the pathophysiology of spasticity. Patients: Eight patients with chronic hemiplegia post-stroke presenting with lower limb spasticity and requiring botulinum toxin-type A injection in the ankle extensor muscle.
Methods: Post-activation depression of soleus H-reflex assessed as frequency-related depression of H-reflex was investigated before and 3, 6 and 12 weeks after botulinum toxin-type A injections in the triceps surae. Post-activation depression was quantified as the ratio between H-reflex amplitude at 0.5 and 0.1 Hz. Results: Post-activation depression of soleus H-reflex, which is reduced on the paretic leg, was affected 3 weeks after botulinum toxin-type A injection. Depending on the residual motor capacity of the post-stroke patients, post-activation depression was either restored in patients with preserved voluntary motor control or further reduced in patients with no residual voluntary control.
Conclusions: Botulinum toxin treatment induces synaptic plasticity at the Ia-motoneuron synapse in post-stroke paretic patients, which suggests that the effectiveness of botulinum toxin-type A in post-stroke rehabilitation might be partly due to its central effects.

OP015
SUSTAINED EFFICACY WITH INCOBOTULINUMTOXINA (XEOMIN) IN UPPER-LIMB POST-STROKE SPASTICITY OVER 48 WEEKS (A PHASE III, PLACEBO-CONTROLLED STUDY WITH OPEN-LABEL EXTENSION)

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Introduction: Botulinum toxin injections have become a first-line treatment for spasticity.
Purpose: To assess the efficacy and safety of incobotulinumtoxinA (Xeomin) for upper-limb post-stroke spasticity (ULPSS) in a 12-week, placebo-controlled study with a 36-week, open-label extension (OLEX).
Method: In the main period (MP), subjects (18-80 years with ULPSS; wrist, finger, and elbow flexor spasticity ≥2 [Ashworth Scale; AS]) were randomized 2:1 to incobotulinumtoxinA (fixed total dose 400U) or placebo. This was followed by three OLEX treatment cycles, each comprising a single incobotulinumtoxinA treatment (400U) with 12-week observation. Outcomes included AS response (≥1-point improvement 4 weeks post-injection), Disability Assessment Scale (DAS) response (≥1-point improvement on principal target domain), adverse events (AEs), and antibody testing.
Results: 317 subjects were randomized in the MP; 296 continued to the OLEX. In the MP and OLEX, AS responder rates after incobotulinumtoxinA treatment were 52.3-61.8% for wrist flexors, 49.1-60.0% for elbow flexors, 54.5-64.5% for finger flexors, 33.9-41.2% for thumb flexors, and 37.4-44.2% for forearm pronators. DAS responder rates after incobotulinumtoxinA were 46.2% (MP) and 52.2%, 62.1%, and 59.4% (OLEX treatment cycles). In the MP, treatment-related AEs were reported for 3.8% and 1.9% subjects for incobotulinumtoxinA and placebo, respectively. The incidence of treatment-related AEs throughout the entire OLEX was 3.0%. There were no cases of clinical non-responsiveness due to antibodies.
Discussion and conclusions: For subjects with ULPSS, repeated injections of incobotulinumtoxinA (400U each at 12-week intervals) showed sustained efficacy in reducing muscle tone and spasticity-associated disability, while confirming the favorable safety profile of incobotulinumtoxinA in this indication.

OP016
ESCALATING DOSES OF INCOBOTULINUMTOXINA (XEOMIN; 400U-800U) FOR THE TREATMENT OF MULTIFOCAL UPPER- AND LOWER-LIMB SPASTICITY ARE WELL TOLERATED

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Introduction: Patients with severe multifocal spasticity may benefit from botulinum toxin treatment at higher doses than generally used.
Purpose: To report the safety of increasing incobotulinumtoxinA (Xeomin, Merz Pharmaceuticals GmbH) doses (400U-800U) for patients with spasticity.
Method: This prospective, dose-titration study (NCT01603459) enrolled 155 patients (18-80 years) with spastic hemiparesis (cerebral causes), deemed to require total doses of incobotulinumtoxinA 800U. Patients received 3 consecutive injection cycles (ICs) with incobotulinumtoxinA 400U, 600U and 600U-800U, respectively, each followed by 12-16 weeks' observation. During each IC, active questioning for adverse events (AEs) took place at all study visits (injection visit, control visits 4, 8 and 12-16 weeks post-injection) and during telephone contacts 1 and 2 weeks post-injection. Patients were specifically asked about AEs that could indicate toxin spread. Investigators' Global Assessment of Tolerability (very good, good, moderate or poor) was also evaluated. Antibody testing (mouse hemidiaphragm assay) was performed throughout.
Results: IncobotulinumtoxinA dose escalation did not lead to an increased incidence of AEs (IC1: 36.1%; IC2: 37.5%; IC3: 25.7%) or treatment-related AEs (IC1: 4.5%; IC2: 5.3%; IC3: 2.9%). Overall, the most common treatment-related AEs were pain in the extremity (1.9%), muscular weakness (1.3%) and dysphagia (1.3%). Investigator-rated tolerability was good/very good for >90% of patients (IC1: 96.8%; IC2: 90.1%; IC3: 97.9%). No patient developed clinical non-responsiveness to incobotulinumtoxinA due to neutralising antibodies.
Discussion and conclusions: Escalating incobotulinumtoxinA doses (400U-800U) were well tolerated by patients with severe multifocal spasticity. Tolerability was not affected by increasing doses. No patient became non-responsive due to neutralising antibodies.

OP017
PRELIMINARY BRIEF ICF CORE SET FOR PATIENTS WITH MYALGIC ENCEPHALOMYELITIS/CHRONIC FATIGUE SYNDROME

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Introduction. Myalgic Encephalomyelitis/Chronic Fatigue Syndrome (ME/CFS) is classified as a neurological disorder (ICD-10 G93.3) and affects several body systems.
Purpose. This study aims to describe the use of the International Classification of Functioning, Disability and Health (ICF) for ME/CFS patients in order to understand the major functional impairments and disability.
Method. A first preliminary version of a Core Set was created from the diagnosis criteria for ME/CFS according to Fukuda (1994) and Canadian criteria (2003). These criterias were operationalized by using different ICF codes. Functional impairments and disability were assessed by a rehabilitation team after clinical evaluation, patient-scored questionnaires and observations. The ICF Core Set was evaluated for 90 consecutive patients (16 males and 84 females), mean age of 45 years (SD 9), referred to a rehabilitation university clinic.
Results. For the component Body Functions, 82-100% of the patients showed impairments in energy (b1300), fatigue (b1308), physical endurance (b4550), fatigability (b4552), emotions (b152), sleep (b134) and pain related categories (b2800, b28010). At least half of the patients (42-67%) showed cognitive (b140, b144, b1440, b164) and perceptual (b21020, b2408) impairments. Blood pressure and heart functions (b4100, b460, b4202 b460) were impaired in 35-57% of the patients, immunological functions (b435, b4351) in 51-62%, body temperature regulation (b550, b5508) in 56-76% and gastrointestinal impairments (b535) in 64%. The most frequent degrees of impairments assessed were light and moderate. For activity, the most frequent limitations found were handling stress situations (d240) (79%) and acquisition of goods and services (d620) (88%). Among participation categories, household work (d640) was limited in 91% of the patients, assisting others (d660) in 93%, remunerative employment (d850) in 87%, recreation/leisure activities (d920) in 82%, and informal socializing (d205) in 91%.
Discussion and conclusions. For the first time, a preliminary ICF Core Set was tested for patients with ME/CFS.

OP018
PREDICTING APHASIA RECOVERY WITH MOTOR EVOKED POTENTIALS

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Introduction: Aphasia is the main cause of communication disorders following stroke. The individual prognosis of aphasia recovery remind difficult to establish in the acute phase. The aim of this study was to investigate whether the motor evoked potentials (MEP) of the hand and the orbicularis oris in the acute phase of stroke could predict aphasia recovery.
Materials and Methods: This study is ongoing at the University Hospital of Bordeaux. All consecutive patients with aphasia, first left hemispheric stroke confirmed by imaging, right-handed, non-demented, have been proposed for inclusion. MEPs were collected after stimulation of M1 the abductor pollicis and the orbicularis oris, right and left. The assessment of language performed in the acute phase was composed of: Language Screening Test (LAST) and the aphasia severity rating scale (ASRS) of the Boston Diagnostic Aphasia Examination (BDAE). Three and six months later, the language assessment was composed by: LAST, ASRS and BDAE. Good recovery from aphasia was defined as a score of ASRS 4 or 5. The association between the presence of a MEP after stimulation and good recovery was studied by Fischer exact tests.
Results: In our interim analysis, 58 patients were followed. The presence of MEP of the right hand (left cortical stimulation) was significantly associated with good recovery 6 months ($p<0.001$) after a stroke, even for patients with severe aphasia (ASRS≤2) initially ($p=0,005$). The results are similar for MEP of the right orbicularis oris (left cortical stimulation) ($p=0,004$).
Conclusions: MEP of hand and lips predict recovery from aphasia. These results suggest the importance of production systems in the recovery of language, suggesting a new approach compared semantic core highlighted in the old classic models such as Lichtheim.

OP019
LANGUAGE ASSESSMENT IN THE ACUTE PHASE TO PREDICT THE CLINICAL OUTCOME OF APHASIA AFTER A STROKE.

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Introduction: Recently, many studies have attempted to identify prognostic factors for aphasia recovery including linguistic assessment in the acute phase. In 2011, Flamand-Roze et al. purposed a screening test for vascular aphasia, the LAST (LAnguage Screening Test). Aim of this study: to determine if some linguistic components evaluated in acute stroke could predict aphasia recovery, and if these components could predict the clinical profile of aphasia.
Materials and Methods: This study is a prospective study, in the University Hospital of Bordeaux, France. Were included all consecutive right-handed patients with aphasia, after a first stroke, confirmed by imagind, left hemisphere injuried, within 14days, non dementia.The assessment included at the acute phase (M0) LAST and the aphasia severity rating scale ASRS of the Boston Diagnostic Aphasia Examination (BDAE), and three months after (M3), LAST, ASRS and BDAE. We considered 3months after stroke that ASRS 4–5 indicated good functional aphasia outcome.
Results: 86patients were included from November 2013 to January 2015. All item of LAST were significantly associated to good recovery at M3 (Mann Whitney $p<0.05$), even for patients with severe aphasia initially (ASRS≤2). LAST word repetition was significantly associated with good recovery ($p<0.001$) in a multi-variable analyse including initial severity and all the items of LAST (M0). All items of LAST (M0) and BDAE (M3), were correlated (Speamann and Mann Whitney $p <0, 05$).
Discussion: This study suggests that acute assessment is more relevant to predict aphasia recovery 3months later. Moreover, the correlation between LAST (M0) and BDAE 3months later suggests that assessment during acute phase could predict the clinical pattern of chronic aphasia. Thus, the motor component of language seems to be relevant concerning aphasia recovery, more than the semantic core highlighted in the old classic models.

OP020
A COMPARATIVE STUDY BETWEEN TWO DIFFERENT 3D RECONSTRUCTION METHODS BY BI-PLANAR RADIOGRAPHIC IN UPRIGHT POSTURE: BIOMODTM3S ET STEREOS®

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Introduction: 3D reconstruction of spine is a way to study spinal diseases.
Purpose: This study aims to evaluate the repeatability and reproducibility of two different methods of 3D reconstruction of the spine sterEOS® and BIOMOD™3S.
Method: Repeatability and reproducibility study. Three reviewers performed the reconstructions : a radiologist, a X-ray technologist and a rehabilitation specialist, inexperienced in X-ray reading. The evaluators made these reconstructions with each modality: sterEOS® and BIOMOD™3S. The parameters investigated were Cobb angle, sagittal parameters (cyphosis, lordosis), determination of apical and junctional vertebrae, axial rotation of the apical vertebra, pelvic parameters and time of reconstruction. Statistical analyses : coefficients of intra-class correlation (ICC) for reproducibility ; Student's t test for time of reconstruction.
Results: We analyzed X-rays of 44 women (71%) and 18 men (29%) with a mean age of 44 ± 20,8. The repeatability was correct, good or excellent depending on evaluator. The reproducibility inter-evaluator was correct to excellent (ICC 0.73-0.96) for every parameters except the axial rotation of the apical vertebrae and the determination of levels of junctional and apical vertebrae. The reproducibility of the axial rotation of apical vertebrae was low to good with BIOMOD™3S (ICC 0.15-0.81 ; ESM = 7.5°). The reproducibility of the determination of levels of junctional and apical vertebrae was low to excellent with sterEOS® (ICC 0.36-0.90). With sterEOS®, the reproducibility decreased by the inexperienced observator for some parameters. The 3D reconstructions with sterEOS® was significantly faster than with BIOMOD™3S (10.8 min vs 14.2 min, $p<0.05$).
Discussion and conclusions: The reproducibility of parameters is different depending on the system. The 3D reconstruction with sterEOS® is faster than with BIOMOD™3S. The reproducibility of BIOMOD™3S is less influenced by observator's experience.

OP021
EFFECTS OF CORE STABILIZATION EXERCISES IN PATIENTS WITH NON-SPECIFIC LOW BACK PAIN: HUBER MOTION LAB VERSUS CONVENTIONAL: A RANDOMIZED CONTROLLED TRIAL

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Introduction: Core stabilization exercises are effective in reducing pain and improving functional status of patients with LBP in comparison with conventional exercises.
Purpose: To evaluate the effect of core stabilization exercises with Huber Motion Lab in comparison with conventional core stabilization exercises on pain severity, depression and activity levels in patients with LBP.
Method: In this randomized controlled trial 30 patients with non-specific LBP were allocated to an experimental (n=15) or a control group (n=15). Both groups received conventional physiotherapy program including 15 sessions of hot pack, ultrasound (6 min), TENS (20 min) and connective tissue massage (10 min) to lumbar region, 3 days a week, for 5 weeks. In addition to this physiotherapy program, control group performed 30 minutes of core stabilization exercises under the supervision of a physiotherapist on the floor, whereas the experimental group used Huber Motion Lab device. Main outcome measures were pain severity (visual analogue scale (VAS)), depression (Beck Depression Inventory (BDI)) and activity level (Oswestry Disability Index (ODI) that performed on the first day and the last day of the treatment program.
Results: In spite of randomization, groups were not similar in terms of baseline clinical characteristics. Severity of all assessed parameters was milder in experimental group than control group ($p<0.05$). At the end of the treatment, pain intensity, depression and activity levels were improved significantly in both groups ($p<0.001$). Between-group comparison of mean change score revealed significantly greater ($p<0.001$) improvements regarding VAS (7.4 vs 4.2), BDI (29.5 vs 13.8) and ODI score (51.7 vs 25.2) for experimental group compared to control group.
Discussion and conclusions: In our group of patients with non-specific LBP, both with and without Huber Motion Lab core stabilization exercises in addition to a physiotherapy program were beneficial in terms of pain severity, depression and activity level.

OP022
THE FUNCTIONAL RE-ADAPTIVE EXERCISE DEVICE: REHABILITATING LUMBOPELVIC MUSCLE FUNCTION IN PEOPLE WITH LOW BACK PAIN

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Introduction: Mechanical low back pain is frequently associated with functional and morphological changes to Lumbar Multifidus (LM) and Transversus Abdominis (TrA) muscles: they atrophy and their activation is delayed, so that they stop working in anticipation of movements and/or loads.
Purpose: In a series of studies we investigated the role of the Functional Re-adaptive Exercise Device (FRED) on the recruitment of LM and TrA to determine its feasibility as a rehabilitation tool for lumbopelvic neuromuscular dysfunction.
Methods: Fifteen male participants performed FRED exercise as well as sitting/standing on unstable surfaces (gym ball/balance board). Thickness of TrA, internal oblique (IO) and external oblique (EO) muscles was measured using ultrasound. FRED exercise was also compared to treadmill walking in nine male participants whilst lumbopelvic muscle activity was recorded using intramuscular electromyography (EMG). Repeated measures ANOVAs were used to assess differences in muscle thickness/activity between conditions. Both experimental protocols were approved by an institutional review board.
Results: Introducing an unstable base of support increased TrA thickness compared to sitting or standing on a stable surface. TrA thickness increased further during FRED exercise. This was accompanied by a smaller increase in IO thickness and a reduction in EO thickness during FRED exercise. Compared to walking, FRED exercise elicited similar levels of TrA and LM activity, whilst erector spinae, IO and EO activity was smaller in FRED exercise.
Discussion and conclusions: FRED exercise preferentially recruits the deep lumbopelvic muscles which become atrophied and dysfunctional in people with low back pain. Our data support the potential for FRED exercise to become a useful adjunct to existing therapeutic interventions in these populations. Future research will examine FRED exercise as a therapeutic intervention for low back pain over a prolonged period.

OP023
TIME SPENT IN EACH POSTURAL SET AND THE NON SPECIFIC PREGNANCY RELATED LOW BACK PAIN

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Introduction: The non-specific pregnancy related low back pain (NSPLBP) is a common condition (incidence: 24 % to 90 %) with consequences for personal and public health. Its causes are not yet defined, however, some authors suggest that physical activity (PA) may be important in prevention. With new methods to assess PA, it is possible to have a new view on the subject, for example, checking the sedentary time.
Purpose: Examine whether the average daily time spent in each posture (sitting, lying and standing) has some relationship with NSPLBP and to investigate the association between sociodemographic, anthropometric and lifestyle and NSPLBP in this sample.
Methods: A longitudinal study in a prospective cohort of 74 pregnant women who were evaluated in the 1st and 2nd trimester. The NSPLBP and individual data were evaluated using a questionnaire. The time spent at each position was evaluated by using an inclinometer.
Results: 63.5% of pregnant women experienced NSPLBP in at least one trimester. Pre-pregnancy low back pain presents association with NSPLBP, as well as being unemployed. No significant associations were found between time spent in each position and NSPLBP, except the average daily standing time total and weekly in 2nd trimester ($p < 0,05$) **Discussion and conclusions:** In this sample NSPLBP was associated with pre-pregnancy low back pain and pregnant women who spend more time on foot in the 2nd trimester have less prevalence of NSPLBP, however, NSPLBP was not associated with sedentary time. It is important to conduct more studies in this field.

OP024
LONG-TERM EFFECTS OF AN IMPLANTABLE PERONEAL NERVE STIMULATOR ON KINEMATICS AND GAIT CAPACITIES IN THE DROP-FOOT TREATMENT OF STROKE SURVIVORS

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Introduction: Peroneal nerve stimulation is an alternative to common foot drop treatments related to a central nervous system lesion. While several studies explored its potential to improve walking speed, gait endurance and symmetry, very few studies investigated its impact on kinematics.
Purpose: The aim of this study was to evaluate the long-term effects of an implantable peroneal nerve stimulator on kinematics and gait capacities in the foot drop treatment of stroke survivors.
Method: 12 patients (4 women/8 men, 45.45+/-12.88 yrs, 171.92+/-8.07 cm, 81.14+/-20.30 kg) were implanted with a Actigait stimulator (Neurodan, Denmark, OttoBock Group) in the CHL hospital of Luxembourg. A 12-month follow-up was proposed in CNRFR - Rehazenter to these patients, composed of 4 assessments (1 month before implantation and 3, 6 and 12 months after implantation). At each assessment, a 10-m walk test, a 6-min walk test and a clinical gait analysis were performed. A t-test was used to evaluate the improvement of each parameter with confidence level of 95%.
Results: Foot clearance and dorsiflexion during swing phase were significantly improved after implantation (average moving respectively from 1.10cm to 2.52cm and from -10.46° to 1.68°). Gait was symmetrised with a step length ratio moving from 1.10 to 1.03. Balance was also improved with a decrease of the double support time (from 36.60% to 30.15% of the gait cycle) and of the step width (from 18.96cm to 17.45cm). No significant modification was observed on knee and hip kinematics. Only 6-min walk test reported a significant increase of gait velocity (from 0.97m.s-1 to 1.29m.s-1).
Discussion and conclusions: A global improvement of quality of gait was observed with a reduced risk of falling. The use of an implantable peroneal nerve stimulator in the foot drop treatment of stroke survivors is thus encouraging.

OP025
INVESTIGATING THE GAIT VARIABILITY AND RELATIONSHIP BETWEEN RELATED FACTORS IN INDIVIDUAS WITH LOWER LIMB LOSS: A PILOT STUDY

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Introduction: Gait variability is an important symptom which related high fall risk in patients and was studied previous investigations in different disorders. But there were no study that investigate this problem in persons with limb loss and related factors such as phantom pain, phantom sensation and sensation loss.
Purpose: Investigating the gait variability and related factors in individuas with lower limb loss.
Method: Twenty individuals with unilateral traumatic lower limb loss(15=below knee, 5=upper knee), ages were 39,52±12,07 years, 8 person have phantom sensation, 5 have phantom pain, 11 have surface sensation loss around stumb distal. Gait parameters(variation of step length, ambulaur index) were evaluated with Gait Trainer Biodex 2, at participan's preferred speed. Phantom pain and phantom sensation were questioned as present or no. Sensation loss evaluated with Semmes Weinstein Monofilaments and questioned as present or no. All articipants have conventional type prostheses socket design and dynamic foot.
Results: There were no correlation between presentation of phantom pain or phantom sensation and gait parameters ($p>.05$) There were correlation between non-amputated side step length variation and sensation loss ($p=.040$, $r=.448$).
Discussion: The study showed that peripheral sensation was important factor leading to gait variability in individuals with traumatic lower limb loss, while phantom pain and sensation has no effect on gait variability.
Conclusions: Peripheral sensation loss was more impact on gait stability than phantom sensaionn and pain. It is recommended that increasing the number of participants to generalize these results.

OP026
TEST TO RETEST RELIABILITY OF OBJECTIVE POSTURAL CONTROL MEASURES IN LUNG TRANSPLANT RECIPIENTS

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Introduction: After surgery, lung transplant recipients (LuTX) are typically cachectic, sarcopenic and limited in their mobility with an increased risk of falls. Assessment and treatment outcome monitoring of impaired postural performance seems relevant to rehabilitation of these patients.
Purpose: This study sought to examine the test-retest reliability of three objective postural stability measures.
Methods: A total of 50 LuTX recipients underwent quantitative posturographic testing (SMART EquiTest, Neurocom, USA) including all the Sensory Organisation Test (SOT), the Motor Control Test (MCT) and the Limits of Stability Test (LOS). LuTX recipients were assessed trice, 2 days before discharge from the acute hospital stay, 1-3 days later (day 2) and after completion of rehabilitation 8 weeks later (day 3). The main variables of interest were the equilibrium sum score derived from the SOT, the average delay from the MCTs and the distance of the maximum trunk excursion in the anterior posterior direction (MXE) from the LOS. Reliability was evaluated with the intra-class correlation coefficient (ICC2,1), Bland Altman plots, the standard error of measurement (SEM), and the smallest detectable difference (SDD).
Results: Relative reliability was varied ranging from poor for the MCT [ICC(2,1)= 0.2], fair for the SOT equilibrium score (ICC(2,1)= 0.6), and excellent for the LOS-MXE [ICC(2,1)= 0.86]. The SOT composite score improved significantly between baseline and day 2 with such changes to the better being clearly larger than those between days 2 and 3. The SEM was 7.1 points for the SOT equilibrium score, 17.1 ms for the MCT, and 10.7 mm for the MXE respectively.
Discussion and conclusions: Among the three SMART EquiTest protocols, the LOS was the only test that enabled an excellent level of reliability and an acceptable level of detection of expected changes in postural stability as a result of planned rehabilitation intervention in LuTX recipients.

OP027
ULTRASONOGRAPHIC MEASUREMENTS OF THE METACARPOPHALANGEAL AND TALAR CARTILAGE THICKNESSES: A RELIABILITY STUDY IN HEALTHY SUBJECTS

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Introduction: Ultrasound(US) imaging is a non-invasive and convenient technique. Since cartilage disorders are commonplace in daily practice of musculoskeletal physicians, assessment of the joint cartilage using US imaging appears to be an important issue.
Purpose: Our aim was investigate the reliabilities of ultrasonographic measurements for talar (TCT) and metacarpal cartilage thicknesses (MCT) that are likely to be involved in hand and ankle pathologies.
Method: Twenty healthy volunteers (10 M, 10 F) were recruited in the study. Every day, five physiatrists measured eight joint cartilage thicknesses (bilateral talar and 2nd, 3rd, 4th metacarpals) in each subject. They repeated all the measurements in five consecutive days.
Results: Intra-observer intraclass correlation coefficient (ICC) values were "excellent" for all MCTs, except for the 3rd left MCT on the 1st day (ICC=0.75), 4th left MCT on the 1st day (ICC=0.79) and 4th right MCT on the 3rd day (ICC=0.79) which were "good". They were also "excellent" for the TCT measurements, except for the left side on the 3rd day (ICC=0.77) and the right side on the 4th day (ICC=0.78) which were "good". Inter-observer ICC values pertaining to the 2nd MCT measurements were "excellent" for all sonographers. 3rd and 4th MCT measurements (at least one side) were "excellent" for four and three sonographers, respectively. The rest of the measurements were "good". On the other hand, while TCT measurements were "excellent" for 4 sonographers, it was "moderate" (left side) and "good" (right side) for one sonographer (ICC= 0.56 and ICC=0.66, respectively).
Discussion and conclusions: Our results have clearly shown that sonographic measurements of MCT and TCT have good to excellent reliabilities in healthy adults. These findings support the possible use of ultrasound for cartilage assessment in various diseases.

OP028
LOW BACK PAIN: OUTPATIENT ULTRASOUND-GUIDED CAUDAL EPIDURAL INJECTION OF CORTICOANESTHETIC

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Introduction: Numerous treatments have been promoted as useful to reduce the individual and socioeconomic burden of low back pain, but many controversies still exist on the effectiveness of the available treatment options. Caudal epidural injections of corticoanesthetic for managing subacute and chronic low back pain conditions are frequently performed interventions but their efficacy is controversial. One of the main limitations to caudal epidural injections is the high failure rate when no imaging guidance is used. Ultrasonographic guidance may help to identify the sacral hiatus and may allow caudal epidural injections to be performed during office visits.
Purpose: To determine the efficacy and safety of caudal epidural corticoanesthetic injections ultrasound-guided, in outpatient with subacute or chronic low back pain, refractory to conservative treatment.
Method: We conducted a retrospective study where we evaluated 7 patients in our outpatient clinic with low back pain related to disk herniation or associated with lumbar spine stenosis, refractory to conservative treatment. A caudal epidural injection ultrasound-guided was performed. Lidocaine and Depo-medrol were administered. Back Pain Index Score (BPI), Modified Oswestry Low Back Disability Questionnaire (MOLBDQ) and VAS were applied at baseline and at 3 and 6 weeks after injection. Adverse events were recorded.
Results: 7 patients (3F; 4M) with a mean age of 55.3 years were included in this study. Mean VAS values at baseline, 3 and 6 weeks were 5.8, 2.2 and 2.0, respectively. Mean BPI values at baseline, 3 and 6 weeks were 62, 18 and 14, respectively. Mean MOLBDQ values at baseline, 3 and 6 weeks were 66, 24 and 24, respectively. No major adverse events were recorded.
Discussion and conclusions: Ultrasound-guided caudal epidural injection of corticoanesthetic seems to be a safe, fast and reliable treatment for short-term pain relief in patients with subacute or chronic low back pain, refractory to conservative treatment.

OP029
DIAGNOSTIC VALUE OF ULTRASONOGRAPHY COMPARE TO ELECTROMYOGRAPHY IN PREGNANCY-RELATED CARPAL TUNNEL SYNDROME

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Introduction: Carpal tunnel syndrome (CTS) is the most common entrapment neuropathy in pregnancy. Electroneuromyography (ENMG) is golden standart in diagnosis and severity assessment. Ultrasound(US) is a less invasive method also commonly used, but not yet as an EMG-alternative. Thus,there are not determined cut off values of median nerve cross-sectional area(CSA) for CTS diagnosis specifically in pregnant women.
Purpose: To evaluate diagnostic value of US compare to EMG in pregnancy-related CTS.
Method: In this prospective cross-sectional study, 178 hands of 89 pregnant women were included. Patients with systemic illnesses, gestational diabetes mellitus, prior history of CTS were excluded. Age,occupation, parity, weight gain and gestational week of patients were noted during clinical assesment. Each subject underwent electroneuromyography (ENMG), consisted of median nerve conduction studies and needle examination. Patients were classified as mild and moderate-severe CTS. Also high-resolution US of all median nerves including CSA measurements at radio-ulnar junction were perfomed. CTS results according to clinical evaluation and ENMG results were compared with US results. Receiver operating characteristic (ROC) curves were calculated in order to detect possible cut-off values of US findings.
Results: In our study population, PRCTS frequency was 36.9 % (n=73), 19.1% of which were EMG-confirmed. Mean CSA was significantly higher in patients with CTS compare to asymptomatic subjects ($P<0.001$). According to ROC curve results, the most optimal cut-off value for the CSA of the median nerve was obtained as 10.15 mm^2, with a sensitivity of 75 % and specificity of 96%. When US and ENMG crossing points were taken, calculated value of CSA was ≤ 10.3(8.99±2.27 mm^2) in asymptomatic subjects , ≥ 10.3-12.4 (11.45±1.31)mm^2 in mild CTS and was ≥12.4 mm^2 in moderate-mild CTS.
Discussion and conclusions: US is useful in CTS diagnosis in pregnant women. Further studies comparing US and ENMG are needed to confirm our results.

OP030
THE ROLE OF MUSCULOSKELETAL ULTRASOUND IN A REHABILITATION CENTER – 15 MONTHS EXPERIENCE

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Introduction: Musculoskeletal ultrasound (MSKUS) is a useful tool with an increasing importance in PRM field, being now an essential component of the musculoskeletal examination. This complementary exam was introduced in our Rehabilitation Center (RC) in August 2014.
Purpose: To summarize our MSKUS activity during the last 18 months, highlighting the relevance of this imaging resource for physiatrist's clinical activity, both as a diagnostic and guidance tool.
Method: Descriptive study of exams and interventions performed at our RC MSKUS sector and literature review about the importance of US in PRM, including in a neurorehabilitation scenario.
Results: A total of 313 MSKUS examinations were performed (54% shoulder, 11% ankle/foot, 10% knee, 9% wrist/hand, 7% muscular/soft tissues, 5% hip and 4% elbow). From the 170 shoulder exams, 45 were required due to hemiplegic shoulder pain. Forty eight per cent were made to inpatients and the remaining in outpatients. Of the total, 19% did not revealed sonographic alterations. Were performed 69 ultrasound guided procedures (19 peri-tendon/ peri-nerve/ peri-ligamentar infiltrations, 19 articular/bursal infiltrations, 10 calcification barbotages, 8 botulinum toxin/ phenol application, 7 joint/ cyst aspirations, 2 nerve blocks, 2 tendon needling and 2 salivary glands infiltrations). There are several recent studies emphasizing the different applications of MSKUS in PRM clinical practice.
Discussion and conclusions: The MSK-US has a determinant role in differential diagnosis and follow-up of musculoskeletal diseases (also in neurologic patients), allowing a precise diagnosis for a better and optimized rehabilitation program. The US-guided component greatly increase the accuracy, efficacy and safety of the interventional procedures. In a RC setting, US has a wide applicability and can be crucial to rule out major acute injuries, helping to decide the need for another diagnosis exams or for other specialties referral.

OP031
EMG IN SYMPTOMATIC LUMBOSACRAL TARLOV CYST PATIENTS WITH UNEXPLAINED CHRONIC COMPLEX PERINEAL, PELVIC AND/OR SACROISCHIALGIC PAIN SYNDROMES

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Introduction: Tarlov cysts (TC) are usually considered asymptomatic and therefore overlooked as a possible cause of sacral and sciatic pain, urogenital and bowel problems. This is especially true for smaller cysts. Controversy remains regarding their clinical importance. Because of this underdiagnosed condition, patients often suffer for several years from unrecognized chronic neuropathic pain and neurological disorders.
Purpose: To report on the presence of lumbosacral TC cysts in unexplained complex chronic perineal, pelvic and sacroischiagic pain syndromes and to identify associated nerve damage in these patients, using EMG of the lumbosacral myotomes.
Methods: In an outpatient clinic of physical medicine, for patients consulting for musculoskeletal disorders, 17 patients with longstanding unexplained and intractable chronic pain syndromes of the perineum, pelvis, sacrum, coccyx, lower back and/or the legs were found to harbor Tarlov cysts on MRI. Other causes of chronic pain were ruled out. EMG of the lumbosacral myotomes was performed by an expert senior neurophysiologist in order to document nerve damage in these patients, including L5, S1, and S2 (tibial nerve innervated intrinsic foot muscles) and S3S4 (external anal sphincter).
Results: All of the patients harbored more than one TC. Nerve conduction studies showed sural nerve abnormalities in 33.3%, delayed S1 Hoffmann-reflex latencies in 12% and ano-anal reflex abnormalities in 60%. Needle EMG showed neurogenic abnormalities in myotomes L5 (87.5%), S1 (18.8%), S2 (64.3%) and S3S4 (81.3%). All patients had abnormalities in the S2 or S3,S4 myotomes, or in both.
Discussion and conclusions: In patients with chronic pains syndromes, the presence of TC should be taken into consideration. A needle-EMG of both the tibial nerve innervated intrinsic foot muscles and the external anal sphincter was able to document sacral nerve root damage in all of these patients. EMG for pelvic, perineal or radicular pain should include a needle EMG of these myotomes.

OP032
BALNEOLOGICAL RESOURCES AND RESORTS OF GEORGIA

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Introduction: Nature has richly rewarded Georgia with natural physical factors. At present, in our country more than 2,000 mineral water springs are accounted, which general output makes more than 130 million liters. Country is rich with balneological -climatic resorts, where except climatic conditions there are both - drinking (Carbonic acid-Sodium Hydro carbonate) and thermal mineral waters (Sulphide, Radon); mud resorts.
Purpose: Research of balneological resources of the western part of Georgia - Adjara and establishment of possibility of their application in medical practice. Introduce Georgia as a country, where balneological resources are widely used in the rehabilitation process.
Methods: We studied availability of therapeutic mud in the mountain region of Adjara.The chemical compositions of macro- and microelementary content of 64 peloids and 38 mineral waters were investigated using the spectrometer Epsilon 5. The mud toxicity experimentally was studied on white rats.
Results: On the basis of the studies (2012-1014) there were determined the locations of the peloids in Adjara region, the data are marked on the map of mineral resources. Experimental it was found that the mud is safe for external use. In the studied samples of the mineral resources there were detected: magnesium, selenium, phosphorus, sulphur, potassium, calcium, bromine, iron etc. Antioxidant activity of several of them is established. Based on the experimental investigations analgesic, resorptive and antiinflammatory effects of these muds were identified. Thus, possibility of application of these peloids in the course of rehabilitation of nervous and musculoskeletal systems diseases was established. There were developed the recommendations for application of the studied keloids in the balneological practice.
Conclusions: We can conclude that abovementioned balneological resources of Georgia can be used as complementary therapy in the process of rehabilitation of various disturbances musculoskeletal and nervous systems.

OP033
BALNEOTHERAPY IN REPUBLIC OF SRPSKA

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Introduction: Balneotherapy is receiving renewed attention from medical specialties and having a revival in our region as well. However, the exact therapeutic potential of balneotherapy still remains unknown.
Purpose: To present a brief history of balneotherapy and show characteristics of known mineral waters in Republic of Srpska (RS); to review studies about their effects on different medical conditions.
Method: The studies which have been conducted between 1990 and 2014 in different spas in RS on efficacy of balneotherapy for different diseases have been searched and analyzed independent of their design.
Results: A total of 16 studies have been found and analyzed. In these studies effectiveness and efficacy of balneotherapy on a variety of diseases could be shown. Nearly all studied balneotherapeutic modalities were applied as bathing cures.Two studies showed decrease of high blood pressure after 14 days of sulfurous baths. Positive effects of sulfurous mineral water on patients with polytrauma and applied external fixators are demonstrated in PhD thesis.Good effects are obtained in patients after ischemic stroke by means of decrease in spasticity and pain and increase of motor control in affected upper limb. One experimental research of the effects of sulfurous mineral water on bone of ovarictomized rats demonstrated positive effects on biochemical, histological and biomechanical properties of tibia, significantly better in comparison with control group.
Discussion and conclusions: The review has shown the effectiveness of the investigated balneotherapy. Nearly all forms of balneotherapy used for treatment of rheumatic diseases in our region were effective. Sulfurous water could be useful and cost effective in treatment of postmenopausal osteoporosis and posttraumatic conditions. A definitive conclusion, however, is not possible because of the heterogeneity of the study designs, methodology and the publication bias.

OP034
EFFECTIVENESS OF REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION ON HAND FUNCTION AND MUSCLE RECRUITMENT IN CHILDREN WITH HEMIPLEGIC CEREBRAL PALSY: A RANDOMIZED CONTROLLED TRIAL

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Purpose: To observe the effectiveness of repetitive transcranial magnetic stimulation (rTMS) on hand function and muscle recruitment in children with hemiplegic cerebral palsy.
Method: 43 children with hemiplegic cerebral palsy were randomly divided into rTMS group (5Hz rTMS plus functional exercise) and the control group (sham rTMS plus functional exercise). Outcomes measurements included the gross motor function measured by GMFM, modified Ashworth scale, nine-hole peg test, upper extremity functional test, and surface electromyography were assessed before, 2 and 4 weeks after treatment.
Results: 1. The scores of rTMS group showed (1) greater rate of reduction at 2 and 4 weeks than the control group in the wrist tone ($P<0.05$). (2) greater rate of increment in GMFM scores at 4 weeks of treatment ($P<0.05$). (3) greater rate of increment in the UEFT scores at 2 and 4 weeks of treatment ($P<0.05$). 2. All children showed decreases in the time of nine-hold peg test in post-treatment ($P<0.05$). No significant differences at each follow-up session between the two groups ($P>0.05$). 3. The surface electromyography data (root mean square, integrated electromyography and co-contraction ratio) was detected no significant differences in post-treatment in all children, and no significant differences between the two groups ($P>0.05$).
Discussion and conclusions: (1) Repetitive transcranial magnetic stimulation plus functional exercise, or sham repetitive transcranial magnetic stimulation plus functional exercise can reduce the spasticity of affected wrists, and improve the hand function and the abilitity of standing and walking in children with hemiplegic cerebral palsy. (2) Repetitive transcranial magnetic stimulation plus functional exercise is more effective in improving the hand function and the abilitity of standing. (3) There is no significant difference in increasing motor unit recruitment of the wrist between the two groups in children with hemiplegic cerebral palsy.

OP035
FUNCTIONAL INDEPENDENCE IN 3.5 YEARS OLD CHILDREN WITH NEONATAL ARTERIAL ISCHEMIC STROKE

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Introduction: Neonatal arterial ischemic stroke is one of the most common type of stroke in children and the most important cause of unilateral cerebral palsy.
Purpose: To find factors related to lesser functional independence at 3.5 years old, in children with neonatal arterial ischemic stroke.
Methods: It was a French multicentric cohort study (AVCnn cohort), on a population of term born children with neonatal arterial ischemic stroke. 100 newborns were included between November 2003 and October 2006, in 39 French hospital centers. At 3.5 years old, their functional independence was assessed by the Wee-FIM scale. The Wee-FIM stars were compared to healthy children of same age in general population and the following factors were studied: cerebral palsy, epilepsy, stroke side and mother study level.
Results: 80 children fulfilled the Wee-FIM scale at 3.5 years old. The motor condition at 7 years old was known in 69 children (42 boys and 27 girls): 23 had cerebral palsy and 7 were epileptic. The AVC was in the left hemisphere in 74% of cases. 70% of the mothers were graduated more than Bachelor degree. Functional autonomy was significantly weaker in the AVCnn cohort than in healthy children of same age ($p<0.05$). The most affected fields were bladder control, bath and shower transfers, expression and comprehension. Epilepsy was the most pejorative factor on independence ($p<0.05$), and even more if associated to cerebral palsy. The most impacted fields were then: dressing, toilet use, sphincters control, and transfers. Stroke side and mother study level were not associated to significative variation of functional independence.
Discussion and conclusions: There is a delay in all functional independence fields in children with neonatal arterial ischemic stroke. Functional independence, assessed by the Wee-FIM scale, is most of all impacted by the presence of epilepsy.

OP036
PREDICTIVE VALUE OF CEREBELLAR GROWTH AND GENERAL MOVEMENTS ASSESSMENTS IN NEURODEVELOPMENT OF VERY PRETERM INFANTS AT 18-24 MONTHS' CORRECTED AGE

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Introduction: Prechtl's method, or general movements (GM's) assessments, is reported to be very sensitive in predicting the long-term outcome or cerebral palsy of preterm.
Purpose: The aim of the study was to compare the predictive value of brain sonography and GM's assessments, for neurodevelopment outcome at 18-24 month's corrected age (CA) in very preterm.
Methods: Sixty eight preterm (£32 weeks' gestation) were evaluated for periventricular leukomalacia, peri-intraventricular hemorrhage, posterior fossa hemorrhage; transverse cerebellar diameter obtained with ultrasound via masthoid fontanelle, in a weekly basis, since the first week of life until 40 weeks pma; and had Fidgety movements (FM) assessed at 3 months' CA. Neurodevelopment outcome at 18-24 month's CA was evaluated by the physiatrist and the pediatrician using the Schedule of Growing Skills II Scale (SGSKII) and Amiel Tison Neurologic Assessment (ATNA).
Results: Mean gestational age was 29.0weeks, and mean birth weight was 1184 g. At term age, cerebellar growth was under the 10th percentile in 7 patients (10.3%). The FM were categorized as normal in 42 infants (61.8%) and abnormal or absent in 7 of them (10.3%). At 18-24 months of age, 54 infants (79,4%) were considered normal by the SGSKII and 6 of them (8,8%) were categorized 6/8.8% as having cerebral palsy by the ATNA. Cerebellar diameter above the 10th percentile at term was associated with normal outcome [RR:1.3;95%CI(0.943-1.853);p:0.029]; and FM was statistically correlated with normal neurodevelopment outcome [OR:3.9;95%CI(3.359-745.7);p:0.005].
Conclusions: Ultrasonographic cerebellar measurements at term-equivalent age and functional (FM) examinations have important complementary roles in predicting neurodevelopment of very preterm infants.

OP037
RETROSPECTIVE STUDY OF CHILDREN WITH SEVERE TRAUMATIC BRAIN INJURY SUBMITTED TO INTENSIVE MULTI-SENSORY STIMULATION PROGRAM

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Introduction: Coma and vegetative states follow severe traumatic brain injury (TBI) in about one of eight patients. The Intense Multi-sensory Stimulation (IMS) in these situations has gained popularity at the end of the last century, despite the lack of evidence about its effectiveness, especially when applied to brain-injured children. This approach is used to promote the arousal from unconsciousness states through regulated sensory stimuli (auditory, visual, tactille, gustatory, olfactory and kinectic) in a controlled environment.
Purpose: Evaluate the effectiveness of IMS in TBI population assisted as inpatient at our Rehabilitation Center.
Methods: This was a retrospective review of clinical notes from our inpatient registers, children suffering from TBI, in the last decade. We analyzed demographics and scores of Rancho Los Amigos (RLAS) and JFK Coma Recovery Scales (JFK-CRS). We have used SPSS to perform the statistical analysis, independent/paired sample t test and Pearson correlation test were performed to analyze the relations between GCS, gender, TBI cause, initial Glasgow score, days as inpatient, and pré and post-treatment scores in RLAS and JFK-CRS.
Results: 17 patients were included (12 male; 5 female; mean age 10 years old, SD 5,3). Car accidents were the most common TBI cause (76%). There was a statistically significant increase ($p < 0.005$) in RLAS and JFK-CRS scores between pre and post-treatment. We have found a positive correlation between evaluation of JFK-CRS and RLAS scores. A negative correlation was observed between days as inpatient and admission RLAS scores. No correlation was found between age, gender, initial Glasgow score, days before stimulation, and RLAS and JFK-CRS scores.
Discussion and conclusions: The IMS Program of our Rehabilitation Center led to improvements of RLAS and JFK-CRS scores in children with incousciousness states. The clinical benefits seen in an overall improvement on functional and cognitive scales are undeniable. Further prospective evidence-based studies are needed, especially in pediatric age.

OP038
CONGENITAL MUSCULAR TORTICOLLIS: WHERE ARE WE TODAY? A RETROSPECTIVE ANALYSIS AT A TERCIARY HOSPITAL

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Introduction: Congenital muscular torticollis (CMT) is a deformity characterized by a persistent lateral flexion of the head to the affected side and cervical rotation to the opposite side due to unilateral shortening of the sternocleidomastoid muscle (SCM). Is a frequent cause of referral to Pediatric Rehabilitation consultation.
Purpose: assess demographic and clinical characteristics, along with treatment plan and outcome, amongst infants referred to a Pediatric Rehabilitation consultation due to CMT. Treatment plan and outcomes were also studied.
Methods: retrospective cohort study of the infants with CMT referred between January 2nd 2012 –December 31th 2014. Data regarding pregnancy and neonatal periods, anthropometric measures, clinical presentation, associated comorbidities, treatment and outcome were abstracted from clinical records. Data was presented as mean(standard deviation) or percentages, if continuous or categorical, respectively.
Results: 115 infants were included, mostly boys (50,4%). Most were referred from Neonatology consultation (42,6%). The mean age at first consultation was 13,2 (12,1) weeks. Most women were primiparous (68,7%), presented a dystocic labor (72,2%) with 20% pelvic fetal presentation. There was no side preference (49,6% at right vs 50,4% at left). At examination, 12.2% had a palpable cervical node, 13.0% a SCM thickening and 27% had changes in cervical ultrasound. The majority (73,9%) were submitted to conservative treatment, 30.4% in our Department. Most infants (94,8%) showed a complete resolution of the torticollis and none needed surgical treatment.
Discussion and conclusions: The CMT is the most common form of congenital torticollis (CT). Causes remain are largely unknown. Early diagnosis and appropriate follow-up are essential as CMT may be a warning sign of underlying conditions.Our program showed a high efficacy of conservative treatment, especially if started early, and include positioning changes, environmental adaptations and standard treatment.

OP039
ADVANCING THE CONCEPT OF REHABILITATION TOWARDS CULTURAL SENSITIVITY: A CONCEPT ANALYSIS

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Introduction: This study was instigated in response to the researcher's own realisation, as a rehabilitation practitioner and educator, that the concept of rehabilitation as identified in the literature may not be culturally sensitive.
Purpose: The aim of this study was to examine the concept of rehabilitation in relation to cultural sensitivity in order to gain new interpretations and understandings for rehabilitation practice and education. The objectives being to discover if there is an essence of rehabilitation that transcends culture and whether the ICF is suitable for use as a cultural framework.
Methods: Concept analysis (Morse 1995) was the research approach used as it enabled the researcher to analyse the literature in depth in order to explore the concept of rehabilitation. Qualitative data in the form of interviews and focus groups with patients, students and health care professionals wad collected from a university and hospital in South West India and analysed along with the literature.
Results: The literature and qualitative data was analysed following Morse's process of establishing maturity and concept clarification. As a result, culturally safe rehabilitation, external factors, family centred decision-making and meaningful rehabilitation were all identified as being integral to the concept of rehabilitation being meaningful to the person and their family.
Discussion and conclusions: A key contribution of this study to the body of knowledge on rehabilitation is that, in order for rehabilitation to be culturally sensitive, it needs to be meaningful to the person-in-their-family-in-their-cultural context. This can be seen as the essence of rehabilitation that transcends culture. In order for this to happen, rehabilitation needs to be emergent: responding to the needs of the person in their cultural context with professionals allowing for variation in individual experiences and perspectives. These elements have been combined into a framework with the person-in-their-family-in-their cultural context at the centre and with links to the ICF.

OP040
A STUDY OF RELATIONAL COORDINATION IN REHABILITATION TEAMS IN SPECIALISED HEALTH CARE.

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Introduction: In the past decades, the need for effective interdisciplinary teamwork to reduce fragmentation of rehabilitation services has been given much attention. Patients are in contact with multiple health care services and providers today due to increased health care complexity. Core rehabilitation activities are; coordination, communication and continuity of care. Interdisciplinary teams are considered essential in rehabilitation services and are a key element in the rehabilitation process. Relational coordination (RC) is defined as; "a mutually reinforced process of communicating and relating for the purpose of task integration". RC has been found to influence the quality and efficiency of care delivery in health care settings. Relational Coordination Survey (RCS) is an international validated survey instrument measuring the coordination and communication in interdisciplinary rehabilitation teams.
Purpose: The purpose of this study was to assess the quality of interdisciplinary teamwork in nine specialised somatic rehabilitation care processes in Western Norway by the means of RCS.
Method: A cross-sectional multicentre study involving health professionals (N=109) in interdisciplinary teams in nine rehabilitation processes in 5 somatic hospitals in western Norway was performed. A Norwegian version of RCS was used to measure 7 items concerning communication and relations in rehabilitation teams. RC is measured using seven survey questions including four questions about communication (frequency, timeliness, accuracy, problem solving) and three question about relations (shared goals, shared knowledge, mutual respect). The association between types of process: stroke, COPD, hip- and knee replacement and arthroscopic knee surgery, and communication and relations in the interdisciplinary teams, were explored. Linear regression models were used to test whether RSC scores vary as functions of the process and/or team. Both RCS items and total scale were used as dependent variable in these analyses, with two-tailed analyses and p-levels of 0.05.
Results: Results will be presented at the conference.

OP041
SATISFACTION AND COMPLIANCE IN REHABILITATION MEDICINE

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Introduction: The patients opinion on their illness - commenly called the "Health Belief Model" - and their assesment of the therapeutical conditions seem to be important key factors, which influence their satisfaction and compliance with the therapy.
Purpose: The description of the relationship between attitudes of patients, organisational circumstances and therapy outcome (satisfaction, reduction of pain, drop out).
Method: At the beginning of their therapy (physiotherapy, music therapy, occupational therapy) patients (N = 270) of a PMR unit in an acute hospital filled out a questionnaire on their attitudes (scales of PAREMO -20, IPQ-R, FREM -8, BRQ, and a VAS for pain). At the end of the therapy they completed another questionnaire on their views of the organisational conditions, pain reduction, and treatment satisfaction. Patients who terminated their therapy preliminary (n = 83) were evaluated as non- compliant (drop outs).
Results: Regression analysis (linear) shows that the experienced reduction of pain (ß =.51, $p < .001$) and the extensivness of information provided by the therapist (ß = .20, $p = .017$) have the most influence on therapy satisfaction (R =.61, $p = .017$). Moreover the scale on "Therapy Organisation" (time coordination, waiting time, adequate care duration, information about therapeutic aims) had a significant positive relation with global satisfaction ($r = .43$, $p < .001$). A preliminary regression analysis (logistic) yields evidence for a reduced compliance (R = .37, $p = .002$) if patients are male, have higher education, feel poorly informed about the therapy, expect a reduction in medication and when the impairment interferes hardly with their ADL.
Discussion and conclusions: The study shows that the consideration of patients opinions has an important positive influence on therapy satisfaction and compliance. Therefore we think it relevant to include more aspects of Personal Centered Medicine for efficient and effective therapies.

OP042
FROM BEDSIDE TO COMMUNITY: THE REGIONAL REHABILITATION SERVICE. A NEW THERAPEUTIC MODEL FOR REHABILITATION

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Introduction: About 8% of the population of Israel lives in the Negev, an area which covers almost 60% of the country. Soroka University Medical Center is a tertiary center in Beer Sheva providing medical services to the whole region. On March 2015 a new state-of-the-art rehabilitation ward with 20 beds was established in Soroka, enabling patients to receive rehabilitation treatment close to their home.
Purpose: To analyze the first six months of the activity of the new department as a part of the Regional Rehab Services Model.
Method: Between March and September 2015, 65 patients (58% - males) were discharged from the department. Patients' ages ranged between 14 and 82 with a mean of 57 years. The majority of patients were admitted following CVA (46%), deconditioning (17%) and hip fractures (9%). Functional level was assessed upon admission and at discharge, using the Functional Independence Measure scale (FIM). Length of Stay (LOS) in the department, as well as time between discharge and continued community rehabilitation and type of treatment were examined.
Results: The average LOS in the department was 26.4 ± 16 days. Average FIM at admission and discharge were relatively high (88 and 106, respectively). After discharge, 35 patients (54%) continued their rehabilitation treatment: 19 (54%) in the community clinics and 16 (46%) at home. The average time between discharge and continuing care was 17.8± 29 days.
Discussion and conclusions: The relatively high FIM measures and low LOS follow the expected patterns in a newly established department. The high percentage of patients that continued outpatient treatment and short waiting time highlights the commitment of the community rehabilitation staff as a part of the Regional Rehab Services Model. The current model, implementing continuousness care while strengthening the relationship between the hospital and the community seems highly effective for patients.

OP043
INTERPROFESSIONAL KNOWLEDGE AS A BRIDGE FOR COOPERATION BETWEEN SPECIALIST AND MUNICIPAL REHABILITATION SERVICES

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Introduction: Patients with traumatic brain injury and multiple trauma are in need of long-term rehabilitation services. Coordination and cooperation between rehabilitation professionals are essential for creating a seamless transition of the patients between services. The transition can also lead to system-induced setbacks in the patients' recovery. Possible facilitators and barriers for good coordination and cooperation are not well researched.
Purpose: This project explores the impact that interprofessional knowledge and various coordination and cooperation pathways have on the rehabilitation and transition between different levels of health care services. It is also discussed how these factors can influence professional support in the patients' rehabilitation process.
Method: Data in this qualitative study is gathered by observation of eight interprofessional meetings and 16 individual interviews at two specialist rehabilitation units. Six focus group interviews with rehabilitation professionals were conducted at municipal rehabilitation services. Data was transcribed verbatim and coded using HyperTranscribe and HyperResearch software. A thematic analysis of data was conducted and themes identified.
Results: Coordination and cooperation is found challenging across different levels of rehabilitation services. Facilitators of knowledge exchange are spatial proximity, regular meeting points, and modern communication channels including electronic solutions and video conferences. Barriers include differences in knowledge bases among professions and service levels, diverse experiences with trauma patients and lack of resources.
Discussion and conclusions: Differences in knowledge bases, lack of resources and meeting points can cause typical institutional setbacks. Facilitators for improving interprofessional knowledge exchange are spatial proximity, regular meeting points and modern communication channels. Interprofessional knowledge is essential for successful coordination and cooperation between services and transition pathways for trauma patients. Furthermore, experiences from trauma rehabilitation can be used in other areas of health care, particularly in younger patients requiring long-term services.

OP044
HEALTH CHARACTERISTICS OF PEOPLE WITH DISABILITIES IN KOREA

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Introduction: We developed health indicators for health monitoring of people with disabilities (PWD) which can be compared with people without disabilities.
Purpose: The Purpose of this study was to analyze the health characteristics of PWD in Korea to evaluate their actual health conditions.
Method: The Health Monitoring survey in conjunction with Survey of the Disabled by the Korea Institute for Health and Social Affairs was conducted using a face-to-face interview with a questionnaire over a 3-month period in 2014. The data obtained from 6,583 participants with PWD aging over 19 years were analyzed. We also analyzed the data from the Korean National Health and Nutrition Examination Survey conducted in 2013 to compare PWD with people without disability.
Results: The results of the Health Monitoring survey of PWD in Korea were as followed: 1) An estimated number of PWD was 273 million and disability prevalence was 5.59%. In addition, the proportion of elderly PWD population was 43.3%. 2) The proportion of PWD who considered their own health as good was 14.8% compared to 34.6% of people without disability. Especially, depression and suicide ideation rates of PWD were more than twice higher than people without disability. 3) The 77.2% of PWD responded that they had chronic diseases, such as hypertension, osteoarthritis, and diabetes mellitus and also had an average of 1.8 chronic diseases per person.
Discussion and conclusions: We conclude that development of health indicators for PWD was needed for the accurate evaluation of health related conditions. Also, these results of the health monitoring survey imply poor accessibility to preventive or health care services for PWD. Further studies are necessary for effective health care provision to meet the complex needs of PWD.

OP045
THE ECONOMIC BURDEN OF RENAL DISORDER IN KOREA

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Introduction:Renal disorder is increasing annually and results in relatively high medical costs and economic burden.
Purpose: The purpose of this study was to estimate the economic burden of people with renal disorder in Korea.
Method: We estimated the economic burden of renal disorder using the nationwide databases between 2008 and 2011. We used a prevalence-based approach to calculate the direct medical cost of renal disorder by the claims data from the Korea National Health Insurance Corporation. The data from the National Disability Registry of the Ministry of Health and Welfare, the Korea National Statistical Offices' records of causes of death were utilized to estimate direct non-medical costs and all indirect costs. The direct costs included direct medical costs and direct non-medical costs associated with renal disorder. The indirect costs referred to costs of lost opportunity due to premature death and productivity loss.
Results: The prevalence of renal disorder increased from 0.08% to 0.11% between 2008 and 2011. The total economic burden of renal disorder substantially increased from $898.9 million(2008) to $1.43 billion(2011), explaining approximately 59.4% increments of the total economic burden, which represented 0.12% of the Korean gross domestic product. Direct medical costs increased(from 78.2% to 82.6%) and indirect costs decreased(from 16.9% to 11.8%). By gender, the costs spent by males were approximately 1.28~1.30 times higher than those spent by females. As for age difference, the group of people aged 50 to 59 was the highest in total cost.
Discussion and conclusions: The results showed that the prevalence and economic burden of renal disorder increased in the years between 2008–2011. The present study was the first study showing some characteristics of economic burdens in people with renal disorder in Korea. The findings supported needs of early intervention services and prevention programs for them.

OP046
VITAMIN D STATUS AND ITS EFFECT ON FUNCTIONAL OUTCOMES

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Introduction: Vitamin D deficiency has been linked to muscle function, body sway and risk of falls. Patients in a rehabilitation setting where physical strength is key to recovery may benefit from investigation into the incidence and benefits of optimal vitamin D (25(OH)D) levels. Previous research established a high incidence of Vitamin D deficiency in patients in level 2 rehabilitation.
Purpose: The aim of this study was to establish if a link exists between 25(OH)D concentrations and patients ability to progress during their rehabilitation stay using standardised functional outcome measures as assessment. Incidence of Vitamin D deficiency amongst community patients was also obtained.
Methods: Vitamin D (25(OH)D) was checked in 102 patients on admission at two level 2 rehabilitation units in North West England. Patients had FIM/FAM (Functional Independence Measure/ Functional Assessment Measure) outcome measures recorded on admission and discharge. The changes in scores were compared to their Vitamin D levels. Length of stay and age were also compared. Incidence of Vitamin D deficiency was retrospectively obtained in 992 patients who had 25(OH)D checked by their GP.
Results: Higher 25(OH)D concentrations were associated with improved changes in FIM/FAM scores (P=0.031). Seventy five patients (74%) had 25(OH)D ≤50 nmol/l. Forty five patients (44%) had levels ≤30 nmol/l. Of patients whose 25(OH)D was checked in community, 59% had levels ≤50 nmol/l and 32% were ≤30 nmol/l. The 25(OH)D concentrations of the community patients was significantly higher than those who were inpatients ($p<0.001$). No significant difference was seen in length of stay or age ($p=0.364$ and $p=0.436$ respectively).
Discussion: Figures from community patients help clarify that the high incidence of insufficient 25(OH)D is not just indicative of geographical or socioeconomic issues. Correlation between 25(OH)D and functional outcomes is small but interesting. More research is needed to clarify what impact supplementation of Vitamin D has on functional outcomes.

OP047
MYTHS AND TRUTHS ON DIETARY SUPPLEMENTS AND NUTRACEUTICALS FOR MUSCULOSKELETAL HEALTH: A SCOPING REVIEW

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Introduction: An inadequate intake of nutrients, low levels of physical activity, and chronic diseases contribute to reduce muscle mass and physical performance in elderly. WHO reported that number of individuals aged ≥ 60 years will triple in 2050, with the sub-population aged > 85 years that will grow faster than the others. Market of nutraceuticals and dietary supplements is growing in Italy, in particular aimed to improve health in elderly.
Purpose: The aim of this scoping review was to analyse the state of the art on micronutrients, available in nutraceuticals or in dietary supplements, commercialized in Italy, in order to identify, according to an evidence-based approach, which of them improve the areas typically involved in functional deterioration of the elderly: bone, skeletal muscle and nervous tissues.
Methods: The Italian Group for the Study of Healthy Ageing by Nutraceuticals and Dietary Supplements (HANDS) performed a scoping review through different steps: list of micronutrients available in dietary supplements and nutraceuticals, used in elderly to improve their physical functioning in three systems (bone, muscle and central nervous system); identification of relevant studies on PubMed, using as MeSH terms the selected micronutrients, adding through PubMed Search Builder the terms: "bone", "skeletal muscle" and "central nervous system"; selection of effective micronutrients; identification of effective and safe dosage regimen.
Results: We evaluated 12 relevant studies (1 international society guideline recommendations, 1 systematic review, 7 randomized controlled trials, and 3 prospective cohort studies). Of the 39 micronutrients available in the market, only 16 resulted to have appropriate scientific evidence of their effectiveness in terms of improving musculoskeletal health in older people.
Discussion and conclusions: This scoping review shows that selected micronutrients in specific doses might effectively improve the musculoskeletal health and cognitive function in elderly.

OP048
PORTUGUESES SURVEILLANCE OF CEREBRAL PALSY AT 5 YEARS OF AGE. HOW TO IMPROVE OUR REGISTRY

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Background and aims: Active epidemiological surveillance of cerebral palsy (CP) provides evidence to evaluate trends of prevalence, severity and inclusion. A sustained, nation-wide surveillance program requires dynamic resources to maintain coverage and validity of the data.
Materials and Methods: The P. Surveillance of Cerebral Palsy at 5 years of age is a national registry that actively registers children at age 5-years-old with CP, using multiple sources. It shares definitions, classifications and tools with SCPE. Registered children with CP born in 2001-2008 were included. Official demographic data are used as population denominators.
Results: 1172 cases born in 2001-2008 were registered, 52 (4.4%) deceased cases. Birth-cohort (BC) prevalence of CP at age 5 was 1.99‰ in 2006, 1.45-1.68‰ in 2007-2010 and ≤0.7‰ afterwards. The rate of deceased cases was 1.8-6.4%, lower in 2006-2008 BC. Cases born in Portugal are 94% (89-96%) and 99% (96-100%) of the survivors lived in Portugal. Multiple notifiers and multiple sources contributed for 25.7% and 16.6% of the cases respectively. The most frequent source was healthcare (81%), followed by education (17%) and the deaths register (1.7%). Physicians are the most frequent notifiers (94%). The clinical questionnaire was absent in 73 cases (6%). Missing values ranged from 0% for gender to 72% for MACS: 7% for the classification of CP, 13-24% for birth variables, 14-16% for GMFCS and BFMF, 20% for cognition, 23% for hearing impairment, 54% for MRI classification.
Conclusions: Active epidemiological surveillance of CP requires a great effort to reach adequate coverage and representativeness. To have a more reliable registry we must support and encourage notifiers, multiple sources and recapture strategies have to be used to achieve an accurate description of this condition on a population and regional basis. Special care should be taken when analyzing data from periods with inadequate coverage or notification biases.

OP049
ASSESSMENT OF SELECTIVE MOTOR CONTROL BY USING ELECTROMYOGRAPHY

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Background: Reduced selective motor control (SMC) is one of many impairments that leads to functional motor deficits in patients with cerebral palsy (CP). It is unclear to what extend the clinical evaluation detect the simultaneous activation of muscles during isolated, ballistic movement of a single joint at self-paced velocity, such as during the SMC clinical tests. The aims of this study are: (1) To determine whether the level of activation of selected muscles, and (2) To determine the incidence of muscle coactivation differs between SMC grade levels.
Participants: Forty-two participants were enrolled into this study: 23 patients with CP (F=13, M=10; Age = 15±5.59 years; Bilateral involvement; GMFCS level I-III) and 19 able-bodied participants (F=14, M=5; Age = 22±1.59 years). All participants were examined in the motion analysis laboratory of the university hospital.
Methods: Subjects were instructed to flex each knee 3 times with self-paced velocity. Examined limbs were classified into three SMC types: 0 = CP limbs have no ability to isolate movement; 2 = CP limbs with complete isolation of movement; C = Control limbs. The surface electromyography was used to measure muscle activation levels of hamstring, rectus femoris, hip adductor, gastrocnemius and tibialis anterior on both sides. The incidence of muscle coactivation was determined based on the occurrence of active or non-active muscle status.
Results: Comparing the mean activation levels of the majority of muscles, we found: CP limbs (Type 0+2) > Control limbs ($p<0.001$); Type 0 > Type 2 ($p<0.05$); and Type 2 > Type C ($p<0.01$). Also, the incidence of muscle coactivation was affected ($p=0.008$) by CP, and was influenced by SMC types as well ($p<0.001$).
Conclusions: Our quantitative study confirmed that SMC is worse in Type 0 limbs than in Type 2. Moreover, Type 2 limbs in CP patents are not equivalent to that of Type C in able-bodied subjects. We confirmed that SMC is affected by CP.

OP050
THE EFFECT OF PROPRIOCEPTIVE FOOT ORTHOSES ON THE POSTURAL CONTROL OF CHILDREN WITH PES-EQUINUS DEFORMITY

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Introduction: The hypothesis is that stimulation of terminal muscle chains, via sensori-motor insoles, results to a modified afferent signal, leading to a relaxing or stimulating effect on the whole body, thus affecting posture.
Purpose: The aim of the present study was to investigate the effect of proprioceptive foot orthoses on the postural control of children with pes-equinus deformity.
Method: Ten chidren with dynamic pes-equinus feet were recruited. Gait and posture parameters were recorded via an instrumented treadmill in neutral shoes without insoles and with proprioceptive insoles. Insoles had four convex-formed spots placed above the skin.
Results: When fitted with insoles, the mean value of the stance phase duration was increased, when compared to no-insole condition, from 62.9 to 66.9% for the left foot and from 65.9 to 69.0% for the right foot. Swing phase was decreased, from 37.1 to 33.1% and from 34.1 to 31.0% for the left and right foot respectively. Double support phase was increased, from 28.7 to 35.8%. Maximum forefoot force was decreased, from 671.3 to 552.0N for the left foot and from 588.3 to 521.6N for the right foot, and maximum forefoot pressure was decreased from 41.5 to 26.6N/cm^2 and from 32.5 to 23.5N/cm^2. When fitted with insoles, postural measurements resulted to a gait line length of 160.1±29.1mm for the left foot and 208.0±20.3mm for the right foot; the corresponding values when no insoles were used were 90.0±14.0mm and 133.6±12.0mm. Antero-posterior displacement was reduced from 146.0 to 139.1mm when insoles were used, whereas lateral symmetry was increased from 14.0 to 24.1mm.
Discussion and conclusions: Gait stance duration was increased for both feet, since patients spend a higher percentage of the gait cycle in double support. The forefoot force and pressure were decreased, and posture parameters were improved, in agreement with the clinically observed improvement.

OP051
A COMPARISON OF MOTOR FUNCTION PATTERNS IN IRANIAN HIGH-FUNCTIONING AUTISTIC AND NORMAL CHILDREN

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Introduction: motor impairment has been widely reported in autistic children. This impairment can lead to great difficulty in negotiating physical environment, social play and interactional behaviors. There is a lack of research examining the complete range of subtle neuromotor signs in this population, which certainly will be useful in goal-setting and decision- making for treating them.
Method: This study compared performance on Bruininks-Oseretsky test of motor proficiency between autistic and typically developing children. In this study 36 (15 female, 21 male) autistic participants (7 to 12 years old) who met the inclusion criteria for the study was recruited from special education schools and autistic clinics in Tehran and normal children selected by matching method. Persian version of Gilliam Autism Rating Scale (Ahmad et al, 2012) was used for gathering information about specific characteristics typically noted in autistic children who adopted for study. Both groups of children were tested using Bruininks-Oseretsky test by a trained blind clinician in order to assess clients' motor skill abilities. Testing process lasts about 50 minutes for each participant.
Results: To examine the differences between two groups' scorings, t-Test was performed which indicated significant differences in 7 subscales of test. However there was no significant difference in certain subscale of test.
Conclusions: the study indicates that motor function abilities in autistic children is different from normal developing children. However some aspects of motor ability are not affected. The overall difference is prominent. The implications of the findings are discussed.

OP052
THE POPLITEAL ANGLE TESTS IN PATIENTS WITH CEREBRAL PALSY

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Background/Objectives: Joint range of motion (ROM) is one of the most commonly used measures in the clinical evaluation of patients with various movement disorders, including cerebral palsy (CP). The popliteal angle (PA) test is an ROM evaluation of the knee joint used routinely, including the unilateral popliteal angle test (PAU) and the bilateral popliteal angle (PAB) test. Taking into consideration the muscle hyperactivity in CP patients and the lack of information regarding the impact of muscle hyperactivity on the results of the PA test, the aim of our study was to determine whether selected knee muscles are activated during PA tests, and whether the position of pelvis in the PA tests affects the level of activation of selected muscles.
Participants: 22 subjects with CP were enrolled into this study (13 females, 9 males; Age: = 14±4.94 years, Range: 7-28 years).
Methods: The PAU and PAB were evaluated in standard positions. The activation of the muscles was recorded by surface EMG electrodes placed on medial hamstring, rectus femoris, hip adductor and lateral gastrocnemius muscles.
Results: The highest frequency of activation (up to 97.7%) is on ipsilateral hamstring, ipsilateral adductors and contralateral adductors. The analysis of differences between muscle activation frequencies in PAU and PAB tests showed that muscle activation in the contralateral leg occurred more frequently during PAU test (Wilcoxon Matched Pairs Test T=0, z=2.8, p=0.005) than during PAB. The position of the PA test affects the level of activation of all contralateral muscle except for gastrocnemius. The position of the pelvis affected ($p<0.05$) the level of activation of all tested muscles in contralateral leg. The PAB angle (12.61-62.34; mean = 34.81, SD = 10.01) was 17% smaller (p=0.025) than PAU angle (16.35-67.60; mean = 41.51, SD = 11.94).
Conclusions: Muscle activation levels may affect the results of the PA test. Neither the PAU or PAB test differentiates the neural and mechanical origin of increased resistance to stretch.

OP053
INTERFERENTIAL ELECTRICAL STIMULATION AND DIAPHRAGMATIC BREATHING EXERCISES IN CHILDREN WITH BOWEL BLADDER DYSFUNCTION

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Introduction: The term "bowel bladder dysfunction" (BBD) describes the children with a combination of functional bladder and bowel disturbances. They complain of urinary frequency and incontinence, non-monosymptomatic nocturnal enuresis, voiding dysfunction, recurrent urinary tract infections (UTIs), chronic constipation and/or fecal incontinence. It is relevant to identify bowel dysfunction because it has been shown that treatment of constipation significantly reduces lower urinary tract symptoms (LUTS). Interferential electrical stimulation has been used to treat chronic treatment-resistant constipation and soiling in children.
Purpose: To evaluate the effects of interferential electrical stimulation and diaphragmatic breathing exercises in children with bowel bladder dysfunction.
Method: 26 children with dysfunctional voiding who were chronically constipated were included in the prospective clinical study. All the children were checked for their medical history regarding bowel habits and LUTS. Physical examination including abdominal and anorectal digital examination were performed. Children kept a voiding and defecation diary, and underwent urinalyses and urine culture, the ultrasound examination of bladder and kidneys and uroflowmetry with pelvic floor EMG. In order to evaluate the colonic transit pattern, colonic scintigraphy was performed. In addition to education and bihevioural modifications, children were assigned diaphragmatic breathing exercises and interferential electrical stimulation for 2 weeks. Clinical manifestations (defecation frequency, fecal incontinence, LUTS), uroflowmetry curve type and post-voided residual urine (RU) were analysed before and after the therapy.
Results: One month after the therapy, defecation increased in 20/26 patients and fecal incontinence decreased in 5/6 patients. LUTS disappeared in 18/26 patients. Bell-shaped uroflow curve was observed in 18/26 children while RU was reduced in 7/12 children.
Conclusions: Interferential electrical stimulation and diaphragmatic breathing exercises are beneficial in chronically constipated dysfunctional voiders. Further trials are needed to define the long-term effects of this program.

OP054
ASSESMENT OF THE QUALITY OF LIFE (QOL) AFTER BOTULINUM TOXIN (BONTX) TREATMENT FOR DROOLING IN CEREBRAL PALSY (CP) PATIENTS USING THE INTERNATIONAL CLASSIFICATION OF FUNCTIONING, DISABILITY AND HEALTH (ICF) CORE-SET

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Design: Randomized, controlled clinical trial, non double blind 40 CP patients: 20 treatment (BoNT-A) and 20 control (non treatment) in two phases. First: Injected submandibular and parotid glands; second: only parotid gland. Participants were evaluated by Gross Motor Function Classification System level ≥ III. Salivary flow rate, was measured at baseline every 8 weeks, total flow (TF) and drooling quotient (DQ). In order to assess the quality of life (QoL) after Botulinum toxin- A (BoNTX-A) was based in the International Classification of Functioning, Disability and Health (ICF) core-set chosen factors and clinical functions (ICF) 10 ítems related with drooling; these were as follows: sucking, chewing, manipulation of food in the mouth, oral swallowing, pharyngeal swallowing, muscle tone and salivation, and 10 ítems related with the patient's social participation, contextual and personal factors.
Results: Proportion of patients injected who decreased ≥50 (DQ) were spastics 58%, dyskinetic 42%, P=0.8045, versus control group who had not reduction. Median time efficacy: injected both glands: 10 weeks in spastics and dyskinetics Injected only parotid glands: spastics 6 weeks, dyskinetics 9 weeks. ICF ítems b5104 salivation ($p<0.0001$). QoL improvement in personal relations.
Conclusions: Only ICF functional factor that showed a direct association with the response to the treatment was b5104 (salivation). The other factors showed no change or relationship after the two injections. Otherwise existed an improvement in communication and personal relationships in cerebral palsy patients after BoNTX-A injection. ICF is useful tool for measured QoL.

OP055
EFFECT OF ANKLE-FOOT ORTHOSES ON GAIT IN CHILDREN WITH CEREBRAL PALSY: A META-ANALYSIS

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Introduction: Different ankle-foot orthoses (AFO) are often prescribed in children with cerebral palsy (PC) although their efficiency on gait remains unclear.
Purpose: (1) To determine the effect of AFOs on gait in children with CP and (2) to evaluate the effect of each types of AFO.
Method: A search was conducted using relevant keywords on the Pubmed, CINAHL+, Web of Science, Cochrane Library databases. Studies in english evaluating the effect of AFO on gait in children with CP with a control condition were selected. Quality of each study was assessed. 10 gait parameters were extracted in each study. Effect size and 95% confidence interval were calculated for each parameter.
Results: 17 studies (490 subjects) were included. Comparing AFOs to control condition, stride length increased (15 studies) d=1,261 [IC95 0,868 ; 1,653], velocity increased (16 studies) d=0.368 [IC95 0.085 ; 0.652], cadence decreased (15 studies) d=-0.73, [IC95 -0.99 ; -0.46]. Ankle dorsiflexion increased at initial contact (10 studies) d=2.024, [IC95 1.613 2.436] and in swing phase (4 studies) d=1.90, [IC95 1.13 ; 2.67]. Ankle power generation in stance phase decreased (4 studies) d=-0,676, [IC95 -1,033 ; -0,318]. Motor function improved (3 studies) d=0,436 [IC95 0,252 ; 0,620]. On the six type of orthosis found, the Hinged AFO was the orthosis that improved the greater number of gait parameters and was the only one to improve velocity with an effect size >0.8 (large effect).
Discussion and conclusions: This study shows medium to large effect of AFO on various gait parameters which supports its recommendation for use in clinical practice. The different orthoses do not have similar effects. New data are needed to refine the choice of the orthosis according to the child gait pattern.

OP056
THE REHABILITATION OF CHILDREN WITH NERVE INJURIES AFTER ELBOW FRACTURES

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Background: Neurological complications after supracondylar fractures of the humeral bone with fragmental dislocation are not uncommon as a result of traction, direct trauma or nerve ischemia. All three nerves that are passing by the elbow (ulnar, radial and median nerve) are involved subjects into these complications. Rehabilitation for children with nerve injuries starts with electrotherapy, through electrophoresis with vasodilatation and conduction of passive exercises in warm baths, all in function to increase the range of motion in the damaged segments.
Goals: The goal of this research is to analyze the impact of nerve injury in the length of rehabilitation and early physical therapy efficiency in achieving best possible functional motion amplitudes of the elbow joint, furthermore, in increasing of muscular strength of the injured extremity.
Materials and methods: Retrospective – descriptive analysis of the parameters was used for the patients with elbow injuries, treated in the outpatient Physical and Rehabilitation Medicine Clinic in Prishtina. Children of age group 0 – 15 with elbow fractures were included in this study. Two comparative groups were created based on Hoyer's Complete Classification to evaluate the degree of rehabilitation.
Results: Timely initiation of rehabilitation program is influential factor in successful rehabilitation, whereas correlation between time of initiation and rehabilitation success have demonstrated important statistical significance, very high correlation $r = 0.75$ $p<0.01$.
Conclusions: Early start of rehabilitation, since the elbow is in cast, causes full functional regain of the elbow joint, therefore any delay in initiation of rehabilitation procedures will leave consequences, ranging from very mild complications up to disability. Nerve paresis and paralysis of this region (radial, ulnar and median nerves) is an indicator for a long term and troublesome rehabilitation. Even if nerve injuries in form of paresis and paralysis are prone toward long term rehabilitation, excellent success is not unreachable.

OP057
LONG TERM SEQUELS OF TRAUMATIC BRAIN INJURY IN CHILDREN

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Introduction: Traumatic brain injury (TBI) is one of the most frequent causes of mortality as well as morbidity among children. It represents an important cause of a long lasting acquired disability on various fields of functioning (mobility, every day life activities, communication, cognitive functions and learning abilities, social interaction).
Methods: Early comprehensive rehabilitation is crucial for the quality of life in children after TBI. All children in our population continued interdisciplinary team inpatient rehabilitation in University rehabilitation institute immediately after treatment in acute hospital. One of the parents was involved in the rehabilitation process with the child on the department. All children were involved in rehabilitation process until reintegration into the home environment in school or kindergarden. Rehabilitation team supported reintegration in education process with regular meetings with pedagogic teams and adaptation of educational program.
Results: Physical recovery was good in nearly 80% of survivors with some problems on the field of dexterity and coordination. In our population three quarters of children gained independency in basic daily activities. Regarding sequels on cognitive field including attention deficit, memory, strategic thinking and work planning 70 – 80% of children had a need of adjustment of educational process and rehabilitation team guidelines for the schooling stuff to deal with it.
Conclusions: Interdisciplinary comprehensive rehabilitation is crucial for better quality of outcome after TBI in children. It has to continue until integration in to the home environment. Because of predominantly cognitive problems as a long term sequels of TBI in children rehabilitation the team has to continue support for the child, his or her family and educational team even when the child returns into the home environment.

OP058
PHYSICAL ISCHEMIA INDUCED BY ISOMETRIC EXERCISE FACILITATED COLLATERAL DEVELOPMENT IN THE REMOTE ISCHEMIC MYOCARDIUM OF HUMANS

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Objectives: The objective of the present study was to investigate the effects of isometric handgrip induced physical ischemia training (PIT) on remote coronary recruitment and growth.
Methods: Seventy-four CAD patients were randomly assigned to either isometric handgrip (IHG) or non-exercise groups (NEG). Patients in the IHG group performed isometric handgrip exercises during one minute of coronary balloon occlusion, while patients in the NEG group remained sedentary. Collateral flow index (CFI), heart rate (HR), systolic blood pressure (SBP) and diastolic blood pressure (DBP) were evaluated prior to and at the end of occlusion. In a second study, 21 CAD patients were randomly divided into isometric handgrip training (IHT) or non-training groups (NTG). Patients in the IHT group performed three months of isometric handgrip training, while patients in the control group remained sedentary. Single-photon emission computed tomography (SPECT) was used to evaluate myocardial perfusion and VEGF levels were determined using ELISA assays.
Results: In the IHG group, CFI was significantly higher than in the control group ($P<0.01$). HR, SBP, DBP in the IHG group were significantly higher than the NEG group ($p<0.01$) at the end of occlusion. In the second study, myocardial perfusion and left ventricular ejection fraction were significantly improved in the IHT group ($P<0.05$, $P<0.01$). VEGF levels in the IHT group were increased significantly ($P<0.01$). Levels of VEGF were negatively correlated with the summed rest score of SPECT ($r=-0.60$,$P<0.01$).
Conclusions: Isometric handgrip exercise-induced physical ischemia training may promote remote collateral recruitment and growth in CAD patients.

OP059
NEUROMUSCULAR MANUAL THERAPY FOR REHABILITATION AFTER CARDIAC SURGERY

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Introduction: Rehabilitation of patients with cardiac diseases takes into account the anatomic and functional interactions between cardiorespiratory and myofascialsystem.
Purpose: Compare the effectiveness of two different rehabilitation approaches in patients undergoing heart surgery in terms of improving quality of life and reducing the risk of postoperative comorbidity.
Methods: 40 patients were randomly divided into two groups. Group A made a classic rehabilitation treatment chosen by the hospital department and EBM validated; group B underwent manual neuromuscular myofascial therapy. All patients were assessed at T0, T1 (first day of post-operative hospitalization) and T2 (dismissal).
Results: Both methods appeared effective in improving the overall health. The main difference was found in the ability to increase muscle flexibility and strength. These parameters improved in both groups, however, in Group A it was found a more significant increase in muscle strength while Group B showed a more significant increase in flexibility. Group B also obtained a greater improvement in hemodynamic parameters (absolute value of blood pressure and heart rate), whose values have declined at the end of cycle treatment; it could be argued in this regard a more effective visceral stimulation performed by manual therapy. The improvement of health and motor skills results in an increase of the well-being and quality of life perception at the Euroquol 5D questionnaire, statistically significant in both groups.
Discussion and conclusion: Basing on these findings, we can state that both methods are effective in improving performance and quality of life in the short period after cardiac surgery. Considering both these results and the literature findings, proving the effectiveness of cardiopulmonary rehabilitation in patients with cardiovascular diseases, we could hypothesize in the future the implementation of an integrated rehabilitation program, involving both the classical treatment and the neuromuscular myofascial manual therapy in order to further optimize patient outcome.

OP060
DEPRESSION AND FUNCTIONAL CAPACITY RESPONSE TO EXERCISE TRAINING AFTER AN ACUTE CORONARY SYNDROME: A PROSPECTIVE COHORT STUDY

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Introduction: Depression is associated with worst long-term prognosis in patients with coronary heart disease, although implicated mechanisms still remained to be determined. Functional capacity (FC) is a strong and independent predictor of cardiovascular morbi-mortality.
Purpose: To establish baseline FC across depressive symptom severity categories and its response to exercise training in Phase II cardiac rehabilitation (CR) after acute coronary syndrome (ACS).
Method: Prospective cohort of patients referred to CR within 3 months after ACS. FC was asses through standard exercise testing at baseline and after CR completion. We used the depression dimension of the hospital anxiety and depression scale (HADSd), and divided study sampling 3 groups: G1: HADSd≤4; G2: HADSd>4 and ≤8; G3: >8). Qui-square and ANOVA were used for between group comparisons.
Results: Of 385 patients included, 328 (85,2%) were male with mean age 54,5±9,9 years, with half (50,9%) suffering ST-segment elevation myocardial infraction and most (84,7%) treated with percutaneous interventions. There was higher prevalence of women (G1:11,4% vs G2:19,4% vs G3: 20,7%), active smoking (G1:50,0% vs G2:52,0% vs G3: 58,0%), overweight (G1:12,4% vs G2:26,1% vs G3: 26,8%) and physical inactivity. FC was reduced with increase depression severity (G1:9,1±2,2 vs G2: 8,1±2,2 vs G3: 7,7±2,2, in MET; p<0,001), but relative response to exercise training was not significantly different between groups (G1:25,2% vs G2: 32,3% vs G3: 32,6%; p=0,10). Secondary prevention goals at CR completion improved similarly across depression categories.
Discussion and conclusions: Although depressed patients showed more severe FC decrease after ACS and have worse cardiovascular risk factor profile, they showed similar improvements with CR and exercise training. This FC improvement might play an important role in future cardiovascular morbi-mortality amongst these patient group.

OP061
MOTOR DEVELOPMENT DELAY IN CHILDREN WITH ACYANOTIC CONGENITAL HEART DISEASE

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Introduction: Development delay is common in congenital heart disease (CHD) children.
Purpose: This study aims to assess motor development in acyanotic CHD children.
Method: 64 acyanotic CHD patients and 50 gender-matched healthy controls from 2 to 5 years of age were included. Gross and fine motor development were evaluated using the Peabody developmental scale, version 2(PDMS-2). Gross motor quotient(GMQ), fine motor quotient(FMQ), total motor quotient(TMQ) were analyzed as the main outcomes measurements.
Results: The mean age, GMQ, FMQ, and TMQ of acyanotic CHD patients were (39.5±10.6) months, (88.6±7.6), (97.9±17.7), and (92.7±7.9), respectively. Those of healthy controls were (42.4±7.1) months, (96.4±5.1), (103.7±8.0), and (99.1±5.4) , respectively. There was no difference in age between acyanotic CHD patients and healthy controls (P=0.078). The GMQ, FMQ and TMQ of acyanotic CHD patients were significantly lower than those of healthy controls (P=0.000, 0.000,0.023).
Discussion and conclusions: Acyanotic CHD patients have gross and fine motor development delay. Therefore, it is important to monitor motor development in acyanotic CHD patients.

OP062
CARDIAC REHABILITATION IN ELDERLY CORONARY PATIENT: AN EXERCISE-BASED SECONDARY PREVENTION

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Introduction: Coronary risk factors are highly prevalent and tend to cluster at elderly age. The absolute risk attributable to each of these factors increases with age because of the excess occurrence of coronary events in an elderly population. As a result, the potential benefit of risk reduction may be even greater for elderly than for younger patients.
Purpose: To make an upgrade about the role of the cardiac rehabilitation in the secondary prevention of coronary heart disease in patients older than 65 years.
Method: Medline and Cochrane Library databases research with the keywords "Cardiac Rehabilitation" AND "Older Adults", "Cardiac Rehabilitation" AND "Coronary Heart Disease"; and relevant articles were selected.
Results: Cardiac rehabilitation programs have observed increases in patients who are older, have multiple comorbidities, heart failure and/or peripheral arterial disease. Despite these benefits, both referral to and participation in exercise rehabilitation have been less frequent in older adults, especially elderly women. A statistically significant improvement in measures of exercise tolerance has been associated with exercise rehabilitation, with no significant difference between the relative improvement of older and younger patients. An exercise-based cardiac rehabilitation is effective in reducing cardiac death, without clear evidence whether an exercise only or a multifactorial cardiac rehabilitation program is more beneficial. There was a favourable but insignificant trend for nonfatal myocardial infarction (MI) and requirement for myocardial revascularization procedures. A meta-analysis showed comparable benefits with exercise and risk reduction strategies, solely exercise, and risk reduction without supervised exercise.
Discussion and conclusions: A multifactorial cardiac rehabilitation is associated with a significant reduction in all-cause mortality and cardiac mortality improving processes of care, coronary risk factor profiles, functional status and quality of life but no significant differences were found in the rates of nonfatal MI and revascularization. Despite the evidence in support of benefit of cardiac rehabilitation in older adults, utilization rates are low.

OP063
CARDIO-CIRCULATORY RESPONSES TO STRESS IN HEART FAILURE PATIENTS WITH LEFT VENTRICULAR DYSFUNCTION BEFORE AND AFTER REHABILITATION

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Introduction. The effectiveness of cardiac rehabilitation (CR) was demonstrated in terms of primary and secondary prevention in patients with congestive heart failure (CHF). To program a custom workout, the initial assessment of physical capacity in the CHF patients is through a cardiopulmonary exercise test with measurements of gas exchange (VO2). It has not been shown in the literature predictor of good response to the CR defined by an improvement in peak VO2 at least 6%, beyond compliance. The objective is to study the evolution of other parameters derived from the stress test (oxygen pulse, cardiac output and stroke volume) and which of these factors could predict the effectiveness CR in patients with CHF.
Method. Monitoring a cohort of 23 patients and comparing the results to a data review of 251 patients assuming the starting VO2 was stable and constant among these 251 patients.
Results. After rehabilitation, most patients improved all their parameters of the cardiopulmonary exercise test. It has not been found a good predictor of response to the CR. However, there is a statistical trend ($p = 0.06$) in favor of better values of oxygen pulse in responders than in non-responders. Finally, a graphical determination of the first ventilatory threshold from the curve of the oxygen pulse seems to be useful if other graphics determinations are non-contributory.
Conclusions. The perspectives would be able to orient the CR program favoring a type of training depending on the cardio-circulatory response of each patient.

OP064
ELDERLY CORONARY PATIENT: A PRACTICAL GUIDANCE FOR CARDIAC REHABILITATION

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Introduction: A cardiac rehabilitation program following a cardiac event is divided into three phases but were remodelled integrating coronary risk factors.
Purpose: To translate from the literature the strongest clinical evidence into practice to better standardization of care in the elderly coronary patients.
Method: Medline and Cochrane Library databases research with the keywords "Cardiac Rehabilitation" AND "Exercise" and relevant articles were selected.
Results: A multifactorial rehabilitation program consists of baseline patient assessment, nutritional counselling and weight management, aggressive coronary risk factor management, exercise training and others. There has been wide acceptance of the benefits of supervised exercise programs for patients with stable angina, recent myocardial infarction and recent coronary artery bypass surgery. The risk of cardiovascular complications from exercise training should be evaluated before starting an exercise program. The risk stratification guidelines published by the American Heart Association (AHA) use four categories (A-D) of risk according to clinical characteristics and included contraindications for exercise. Patients referred for outpatient cardiac rehabilitation typically belong to class B/C. They require different degrees of monitoring or supervision during exercise. The components of an exercise prescription include the mode, frequency, duration, and intensity of exercise. Exercise progression and supervision are also important. The AHA has published recommendations for classification of exercise risk, which are used to determine the need for supervision and the level of monitoring required. Most outpatient programs consist of three times weekly ECG-monitored exercise sessions for 8-12 weeks, and sometimes longer. The goals are to develop a safe and effective individualized exercise prescription to reduce coronary risk factors.
Discussion and Conclusions: Exercise training programs in elderly subjects requires only modest modifications in the exercise prescription and training techniques that are used in younger coronary patients. The specific recommendations for activity levels and energy expenditure should be individualized and must take account of age-related cardiovascular changes if no contraindication is present.

OP065
A COMPARATIVE ANALYSIS OF THE RESULTS OF MEASUREMENT OF CIRCUMFERENCE AND LENGTH OF THE RIGHT BIG TOE AFTER THE COMPLETION OF THE PERIPHERAL AND CENTRAL LYMPH DRAINAGE

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Introduction Lymph drainage is a manual technique applied by a physician or physical therapist. It is addressing medical and cosmetic problems by eliminating the accumulated lymph. It is essential to determine the level and cause of delayed or interrupted lymph flow prior to the procedure.
Purpose We have investigated application of the anatomical principles of drainage starting from the central parts of the lymphatic system, and our goal was to prove the advantage of the central over the peripheral lymph drainage. Emptying the central part of the lymphatic system activates the entire chain of lymphangion.
Method We applied a manual technique which includes supporting contractions of myocytes of the lymphangion in the group of 30 healthy subjects (professors and students of our school). The pressure is made in the direction of the lymph flow, following the rhythm of the contractions. Peripheral lymph drainage of the right big toe was followed by measuring circumference below the root of the nail. Next month the central lymph drainage in venous angle was performed in the same manner, in the same group. Both peripheral and central lymph drainage were repeated for four times. For statistics, we applied ANOVA for repeated measures, with the significance level set at 0.05.
Results We found significant difference of means of four measurements of the big toe circumference following central lymph drainage (Wilk's Lambda= 0.435, $p<0.01$; $F(3, 27)= 11.711$, $p<0.01$). Difference between the pairs of measurements was also significant.
Conclusion We proved the advantage of central lymph drainage in relation to the peripheral one in our sample.

OP066
LOW BONE QUALITY IN CHILDREN WITH ACYANOTIC CONGENITAL HEART DISEASE

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Introduction: Study of bone quality in children with acyanotic congenital heart disease (CHD) is limited.
Purpose: This study aims to evaluate bone quality status of children with acyanotic CHD, to provide the essential clinical basis for obtaining appropriate and optimal rehabilitation intervention.
Method: 114 children ages 2 to 7 years old with acyanotic CHD children (46 boys, 68 girls) as the CHD group, were measured of bone quality by Quantitative Ultrasound (QUS, Omnisense7000P, Sunlight Ltd., Israel), compared to a control group with 100 healthy children (49 boys, 51 girls). Speed of Sound (SOS), Z-score, percentile in bone were analyzed as outcome indexs. SOS means the speed of ultrasound transmitted through bone cortex. Z-score is the difference of standard deviation compared to the average value of Asian population with matched age and gender. Percentile is the difference represented by percentile compared to the average value of Asian population with matched age and gender.
Results: The SOS in the CHD group and control group were 3488.5±172.0 m/s, 3535.4±131.1 m/s, relatively. The SOS in the CHD group was lower than that in the control group. 48.2% CHD patients didn't obtain a healthy bone quality status.
Discussion and conclusions: 48.2% of acyanotic CHD patients exist low bone quality, which potentially indicate bone strength surveillance in clinical evaluation of acyanotic CHD children is needed.

OP067
FUNCTIONAL INDEPENDENCE, SYMPTOMS, QUALITY OF LIFE AND EMOTIONAL RESPONSES FOLLOWING POST-EXACERBATION PULMONARY REHABILITATION

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Introduction: Psychosocial factors may affect outcome of pulmonary rehabilitation (PR), and benefits can be limited if significant psychosocial issues are not addressed. Nevertheless, health and psychological status measurements have not yet been incorporated into routine clinical assessment.
Purpose; To explore relationships between changes in exercise tolerance and changes in health and psychological status after post-acute PR.
Method: We retrospectively studied 52 patients (25m; age 72.5±8.5yrs), affected by COPD (Group1: n=38; 18m) and by other chronic respiratory diseases (Group2: n=14; 7m), admitted for inpatient intensive PR after acute or acute-on-chronic respiratory failure. Changes in dyspnea, Quality of Life (QoL), Functional Independence Measurement (FIM), were analyzed and correlated with changes in health and psychological status.
Results: Hypoxemia, hypercapnia, dyspnea, reduced exercise tolerance and limitation in daily-life activities were observed at admission. No differences in clinical and anthropometric characteristics between Group1 and Group2 were observed, except for spirometry (FEV1, FEV1/FVC) values. After PR, significant improvement in hypercapnia, walking distance (6MWD), FIM, St. George Respiratory Questionnaire (SGRQ), Medical Research Council (MRC) dyspnoea and anxiety status was observed. An improvement in Beck Depression Index occurred only in Group1, particularly in those with more severe disease stage. After PR, 6MWD minimal clinically important difference (MCID) was observed in 63.1% of patients in Group1, 71.4% in Group2; SGRQ total score MCID was found in 73.2% and 64.2%, respectively. No significant correlation was found between changes in 6MWD and changes in SGRQ, FIM, MRC, anxiety and depression scores.
Discussion and conclusions: Changes in health and psychological status may be not directly correlated to changes in exercise tolerance in severely impaired post-acute respiratory patients. All these measurements should be considered and included in PR outcome evaluation.

OP068
PHYSICAL ACTIVITY RELATED INJURY PROFILE IN CHILDREN AND ADOLESCENTS ACCORDING TO THEIR MATURATION AND LEVEL OF SPORTS PARTICIPATION– EPIDEMIOLOGICAL STUDY

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Introduction: Physical activity (PA) is beneficial, enhancing healthy development. However it is estimated that one third of school-age children practicing sport regularly suffer from a serious injury. These injuries tend to be associated with gender and chronological age. Our aim is to extend these associations to biological maturation assessed by maturity offset and bone age.
Purpose: Identify the importance of age, PA level and maturity as predictors of injury in Portuguese children and adolescents.
Methods: Information about injury and PA level was assessed via two questionnaires (LESADO and RAPIL II) distributed to 647 subjects aged 10 to 17 years involved in an epidemiological study. Maturity offset (time before or after peak height velocity according to Mirwald references) and Tanner-Whitehouse III bone age estimates were used to evaluate maturation. Binary and linear gamma logistic regressions were used to determine significant predictors of injury and injury rate.
Results: Injury occurrence was higher for both sexes, in recreative, school and federated athletes. In boys, injuries also increased with age and in girls injuries increased in the higher maturity offset group. Injury rate was higher for both sexes in the no sports participation group. Early mature girls and girls with higher bone age and lower Maturity offset showed higher injury rate.
Discussion and conclusions: Injuries in Portuguese youth were related to PA level, age and also to biological maturation. Recreative, school and federated athletes had more injuries occurrences but no sports participation subjects had higher injury risk. Older boys and girls had more injuries. Early mature girls may be particularly vulnerable to sport injury risk due to physical and physiological processes of growth.

OP069
PHYSICAL ACTIVITY LEVEL AMONG ADOLESCENT IN SAUDI ARABIA

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Introduction: The prevalence of insufficient physical activity globally in 2012 was 79.7% among adolescents. Regular physical activity is important for general health. Purpose: This study aim to estimate the prevalence of physical activity in Saudi Arabia among adolescents from both genders. Differences in physical activity among sociodemographic factors and the causes of physical inactivity were also examined.
Method: A cross-sectional survey was conducted from December 2014 to June 2015 among Intermediate and secondary students aged 11 to 18 years old. Students who exercise for 300 minutes or more per week are considered physically active.
Results: A total of 445 adolescents were included (200 males, 255 females). The prevalence of engaging in physical activity was 74%. Only 21.8% of them were physically active No significant correlation between age and physical activity was found ($p>0.005$). Females were less active than males (61.7%). Of adolescents, 8.7% admit there are obstacles preventing them from being active. The reasons were, due to medical conditions such as ankle injury, back pain, asthma, fainting, hip fracture, scoliosis and obesity (30%), laziness (22.5%, lack of motivation (15%), in general busy with study (12.5%), lack of time (12.5%).
Discussion and conclusions: This study found the prevalence of active adolescents is 21.8%. Male were more active than female participants due to social constrictions and limitation that females face in Saudi communities. Reasons behind averting adolescents from physical activity include: medical conditions and laziness. We recommend that more attention to be given to female sport facilities to increase the number of active females.

OP070
ULTRASONIC IMAGE AND ANTI-INFLAMMATORY EFFECTS OF ANTIOXIDANT POLYMER NANOPARTICLES AT THE SKELETAL MUSCLE AND TENDON

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Introduction: For the diagnosis of muscle and tendon injury, ultrasonography examination has many advantages; however, the diagnostic value is less appreciated than MRI. Recently, many studies tried to enhance the diagnostic value of ultrasonography by using contrast. Antioxidant polymer nanoparticles (APN) inhibit inflammatory and apoptosis after being activated to hydrogen peroxide (H2O2).
Purpose: We tried to see the advantages of the APN on the injured muscle and tendon. To assess whether the formation of H2O2 actually occurs at injury site after mechanical injury and to evaluate the differences in ultrasonic image and anti-inflammatory/apoptosis effects between the APN injected group and the control groups
Method: Compression injuries were given to the triceps surae muscle and achilles tendon of rats by a TMS-PRO texture analyzer at a peak force of 160N and a rate of 20nm/min. In the injected group, the right hind limb was injected with APN. The left hind limb were not injected and were used as control. For quantification of H2O2 at injury site and intact site, the Amplex red assay was analyzed. Ultrasonographic scanning was performed before and after the injection of the APN at the injury site for differences in ultrasonic image through the injection. In order to determine the effect of anti-inflammatory and apoptosis, western blot and RT-PCR were conducted.
Results: The injured group had significantly higher H2O2 than control group at the Amplex red assay. Ultrasound images of the muscle and tendon after injury showed hypoechoic lesion and loss of the fibrillary pattern. However, it was not prominent. After injection with APN, the injury sites become more hyperechoic focus by ultrasonography. At the western blot and RT-PCR, the injected group showed more significant inhibition of inflammation and apoptosis than the control group.
Conclusions: Our study suggests that the injection with APN on the injured muscle and tendon might be able to improve the diagnostic value of ultrasound image and anti-inflammatory/apoptosis effects.

OP071
HELIOS FITNESS INDEX (HEL.F.I.) COMPARED TO GERMAN ESSLINGER FITNESS INDEX (E.F.I). FOR EVALUATING WOMEN'S PERFORMANCE

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Introduction: In the study of muscle performance, movement has to be described in terms of velocity and acceleration.
Purpose: This study analyzed parameters of locomotor system and compared Greek Helios Fitness Index (Hel.F.I.) with German Esslinger Fitness Index (E.F.I).
Methods: Healthy Greek women aged 20-79 years (n=176) divided into 6 groups, were performed jumping mechanography (Leonardo platform, Novotec, Germany). This system measures forces (N), calculates through acceleration the vertical velocity (m/sec) of centre of gravity and calculates power (Watt) of vertical movements. The new value Hel.F.I. was based on the previous work of Dr. Runge M. in the German population (E.F.I). A Hel.F.I. value of 100% corresponds to the average value of the Greek healthy women of our material of the same age according to power/body weight parameter (W/Kg).
Results: In women a decline in the kinetic and kinematic parameters during aging is expected (except Force). Hel.F.I. presents lower values than E.F.I.
Discussion and conclusions: This could be explained because of differences between reference groups (Greek, healthy vs. German healthy sportive women). This study calculated Hel.F.I which is a valuable tool to measure physical performance and added reference data for jumping mechanography.

OP072
EXPLORING THE EFFECT OF A SECOND CLOSELY-TIMED INFILTRATION OF PLATELET-RICH PLASMA TO TREAT PROXIMAL PATELLAR TENDINOPATHIES

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Introduction: Some clinical series have evaluated the effect of platelet-rich plasma (PRP) in the treatment of jumper's knee. Although it is possible that a single infiltrative administration may prove to be an effective treatment for this indication, most of the existing studies evaluated the effects of 2 or 3 successive infiltrations.
Purpose: The aim of this study was to evaluate whether 2 infiltrations of PRP proves more effective than a single treatment.
Methods: Twenty patients suffering from chronic jumper's knee were enrolled into the study and split into two randomized groups (1 or 2 infiltrations of PRP, respectively). The 3-month follow-up evaluation consisted of VAS, IKDC and VISA-P scores, along with algometer, isokinetic and ultrasounds evaluations. After 1 year, subjects were contacted to define their functional evolution.
Results: The concentration of the PRP used for each infiltration was similar in both groups, and contained no red or white cells. Results revealed no difference in treatment efficacy between the groups.
Discussion and conclusions: The comparison between 1 or 2 infiltrations of PRP did not reveal any difference between the 2 groups at short to mid term. A second closely-timed infiltration of PRP to treat jumper's knees is not necessary to improve the efficacy of this treatment in the short term. A second infiltration should perhaps be envisaged later, but this remains to be demonstrated.

OP073
FUNCTIONAL OUTCOME AFTER REHABILITATION OF JORDANIAN STROKE PATIENTS

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Environment can affect activities of daily living of patients with stroke. The role of environmental barriers in patients with stroke has been explored in this study. A sample of 116 Jordanian patients with stroke was recruited from rehabilitation department at Jordan university hospital. A questionnaire explored the role of different types of barriers in affecting daily functioning and correlations were explored between patient's demographic data and illness characteristics. Results showed that some environmental factors hindered daily activities and functional outcome.

OP074
ULTRASOUND ASSESSMENT OF THE MEDIAN NERVE IN CARPAL TUNNEL SYNDROME BEFORE AND AFTER CORTICOSTEROID INJECTION

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Carpal tunnel syndrome (CTS) is the commonest entrapment neuropathy.(1, 2) Ultrasound (US) has been used to assess the median nerve (MN) in carpal tunnel since 1992 by assessing the cross-sectional area (CSA) primarily.(3) However, there is very limited published research looking at the changes in the MN after treatment with corticosteroid injection. (4, 5) Elastography assessment of the MN after injection has not been documented.

1. To assess the MN and carpal tunnel before and after corticosteroid injection by means of US (including power Doppler and elastography), NCS and clinical assessment.
2. To establish if US findings can be used to predict whether a patient will respond to injection.
3. To establish what the clinical outcome is at 6 months to corticosteroid injection in CTS.

Patient with symptoms and signs of idiopathic CTS based on clinical assessment were recruited from outpatients. Patients were assessed with US (including elastography and power Doppler), NCS, the Levine- Katz CTS questionnaire (LKQ) and visual analogue score (VAS) for pain at baseline, 6 weeks and 6 months. LKQ was the primary outcome measure. Healthy volunteers were also recruited to act as a control group.

A total of 29 patients (40 wrists) and 12 controls (23 wrists) were included in the study. The LKQ scores and VAS for pain improved significantly between baseline and 6 weeks ($p = <0.001$), but this significant improvement was not maintained at 6 months. There was a statistically significant reduction in CSA of the MN at 6 weeks and 6 months ($p = 0.002$ and 0.038 respectively). Vascularity and MN stiffness as assessed by elastography did not change significantly during the study period. All six NCS parameters assessed improved significantly. CSA of the MN could not predict response to injection as there was no significant difference in CSA of the MN in responders versus non responders.

Corticosteroid injection leads to significant improvement in median nerve CSA as assessed by US and function as assessed by NCS up to 6 months. However patients' subjective assessment of improvement in symptoms and function did not match the objective measures at 6 months. US cannot be used to predict response to treatment based on this study.

OP075
THE FRENCH NATIONAL REGISTRY FOR FACIO-SCAPULO-HUMERAL MUSCULAR DYSTROPHY: PRELIMINARY STATISTICAL ANALYSIS AFTER TWO YEARS OF INCLUSIONS

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The French National Registry for Facio-Scapulo-Humeral muscular Dystrophy (FSHD) has been launched in June 2013. The principal aims of this project are to collect epidemiological data, to promote clinical research, and to develop standards of care for FSHD patients. A dedicated database and website (www.fshd.fr) have been developed to enable online data input. Molecular and clinical curators validate genetic and clinical data. Patients included are FSHD1 patients genetically confirmed (inclusion possible through clinical evaluation form and/or the self-reported form), and patients presenting with FSHD
phenotype without the typical D4Z4 contraction (FSHD2 and/or FSHD-like patients, only through clinical evaluation form). Data collected are related to genetic diagnosis, muscular and extra-muscular involvement, pain and patient care.
So far, nearly 500 patients have been included. Not only this value represents about 30% of expected French FSHD patients, but also it's one of the largest cohort of FSHD patients data collected so far. The aim of this study is to present preliminary statistical data analysis on this cohort focusing on FSHD1 patients whose clinical evaluation form will be available at the end of December 2015. We will present demographic and general characteristics of this population, genotype/phenotype correlation based on number of D4Z4 repeated units, age of onset and severity of clinical involvement (age related CSS, MMT score on 36 muscles corrected by disease duration). We also performed statistical analysis concerning the correlation between the distribution of respiratory and extra-muscular involvement with the age of onset, with the severity of clinical involvement (see above) and with the number of repeated units. Moreover, we will present preliminary data on outcome measure that are standardly used to evaluate disease progression over two years' time. These preliminary analyses will allow us to develop future directions of clinical research and will contribute in drawing national evidence based patients guidelines.

OP076
DALFAMPRIDINE IN MULTIPLE SCLEROSIS - BEYOND GAIT

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Introduction: Persons with multiple sclerosis consider walking as the most valuable bodily function, with 41% to 75% of people experiencing mobility problems. Dalfampridine (D-ER), a potassium channel blocker, helps to restore axonal conduction and has been identified as a potential improver in impaired neurologic function and gait.
Purpose: Impact assessment of D-ER on walking, balance and functional level in MS patients.
Material and Methods: Prospective non-randomized study, on MS patients treated with 10mg fampridine twice daily. Standardized protocols and questionnaires were used to evaluate the impact of D-ER: Multiple Sclerosis Walking Scale 12 (MSWS-12), Timed 25-Foot Walk (T25FW), Timed Up and Go (TUG), Berg Scale, Locomotion Functional Assessment Measure (L-FIM+FAM). The results were statistically analysed using the descriptive statistical analysis and Statistical Package for the Social Sciences.
Results At 6 months: total of 21 patients (7 male, 14 female), mean age 48,4 years old, with 16 (76.2%) found to be responders. Responders mean improvements (Week 2, Month 1, Month 3, Month 6 respectively) of 22,0%, 15.3%, 26.0%, 23.3% in MSWS-12; 14.3%, 18.1%, 16.0%, 33.9% in T25FW; 32.0%, 33.4%, 38.8%, 56.8% in TUG; 3.2%, 13.0%, 9.8%, 22.6% in Berg Scale; 0, 0.4, 0.9, 1,2 points in L-FIM+FAM. The increase in balance and gait velocity seems to be statistically significant; gait improvement was due to both a higher cadence and a greater step length.
Discussion and Conclusion: The preliminary results of our study show fampridine potential for gait and balance improving. Further research is needed to identify and characterize predictors of responsiveness, application in other pathologies and evaluate other potential functional outcomes.

OP077
ANNUAL FATIGUE FLUCTUATION IN MULTIPLE SCLEROSIS PATIENTS AND HEALTHY POPULATION

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Introduction: The most frequent and disabling symptom is fatigue as the majority (75-90%) of patients with MS experiences it. Researchers state that fatigue in MS may be attributed to a variety of biological, psychological and environmental factors.
Purpose: the purpose of the study was to investigate the seasonal variation of fatigue during every season of the year in a Greek sample of MS patients as well as healthy population.
Methods: 65 patients with MS and 45 healthy people matched for age and sex participated in the study. Measurement of fatigue was based on Modified Fatigue Impact Scale (MFIS). The measurements were conducted every three months, November, February, May and August and the last day of respected month.
Results: MS patients exhibited higher fatigue, both overall and in its separated aspects. Physical fatigue improved from November to February only for the MS group. Mean values (M) of overall fatigue for MS patients and healthy population were M = 31.73 (SE = 2.05) and M = 15.76 (SE = 2.28) respectively, $F(1, 110) = 27.08$, $p < 0.001$.
Discussion: As expected, patients exhibited higher values concerning fatigue. Patients demonstrate decrease of physical fatigue during winter and increase during spring and summer while the healthy population seems to remain stable. The seasonal variations of fatigue were similar for both groups with exception to physical aspect.
Conclusions: Seasons seem not to affect fatigue, taking in consideration the fact that there are many means of climate regulation at hand. The fact that fatigue remains high and stable for the patients indicates that special care should be taken in order to ameliorate it.

OP078
RESPIRATORY DYSFUNCTION IN MULTIPLE SCLEROSIS: A PRELIMINARY STUDY IN PATIENTS WITH WALKING DISABILITY

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Introduction – Respiratory disorders in multiple sclerosis (MS) have been well described in early stages of the disease, especially in ambulatory patients. In patients with complete walking disability, they remain a major cause for morbidity and mortality. To date, respiratory dysfunction in these patients has not been fully described.
Purpose – To assess respiratory impairment of patients suffering from advanced stage of MS.
Method – We conducted a prospective transversal study from 2012 to 2015, including patients followed for MS, with an EDSS above or equal to 7. All patients referred to our department had complete pulmonary function tests (PFT) to study lung volume and capacity. Clinical data were retrieved from medical files.
Results – Seventy-three patients completed full PFT. The median EDSS was 8 with interquartile range [7,5;8,5]. Fifty-three (72,6%) patients had a global respiratory impairment with a mean vital capacity (VC) of 57,9% [±33,5] of theoretical value. A severe impairment defined by VC<50% was found in 34 (46,6%) patients. Cough was impaired in 45 (61,6%) patients with a mean peak cough flow (PCF) of 3,14L/s [±1,9]. A severe impairment defined by a PCF<2,67L/s was found in 27 (37%) patients. The expiratory reserve volume (ERV) was more diminished than the inspiratory capacity (IC) respectively 38,7% [±41,5] of theoretical value and 66,8% [±39,7]. We found an obstructive pulmonary disease in 7 patients (9.5%). EDSS was correlated with the severity of respiratory impairment measured either by the VC or PCF (p<0,001). There was no correlation between the decrease of VC or PCF and the duration of MS, or time from loss of walking ability.
Conclusions – The respiratory function impairment in advanced MS is clinically significant and predominant on expiratory function, which could explain, when associated with swallowing disorders, the high risk for pneumonias and associated mortality.

OP079
VIBRATION THERAPEUTIC EXERCISE IN PATIENTS WITH MULTIPLE SCLEROSIS: A PILOT STUDY

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Introduction: Spasticity, deriving from a pathological increment of stretch reflex, is a frequent condition in many neurological diseases, with a strong impact in walking ability and daily life. Vibration Therapeutic Exercise (VTE) may modulate reflex activity, thereby decreasing spasticity.
Purpose: The purpose of this study was to evaluate the effect on leg spasticity and perceived quality of life after 10 sessions of Whole-Body Vibration (WBV) training in adults with Multiple Sclerosis (MS).
Method: Fourteen persons with MS (age 53.1 ± 5.8 years) and leg spasticity were recruited for the WBV training on vibration platform (30 Hz). WBV sessions were performed 3 times per week for 4 weeks, with 10 repetitions of 30 seconds per session, 10 minutes rest, and another sequence of 10 repetitions. Pre- (T0) and post-training (T1) measures of spasticity were performed using the Numeric Rating Scale (NRS), Modified Ashworth Scale (MAS) and Multiple Sclerosis Spasticity Scale-88 (MSSS-88), while Multiple Sclerosis Quality Of Life-54 (MSQOL-54), divided into a Mental and a Physical Score, was the outcome measure for the perceived quality of life.
Results: Nine patients completed the 10-sessions training. Leg spasticity decreased significantly after WBV program, with a reduction of 1.22 ± 0.97 points in NRS ($p<0.05$), 24 ± 18.48 points in MSSS-88 ($p<0.05$) and 2.44 ± 1.74 points in MAS ($p<0.05$). Moreover, there was a significant improve of perceived quality of life, with an increment of 9.55 ± 10.09 points in Mental Score ($p<0.05$) and 7.29 ± 6.05 points in Physical Score ($p<0.05$).
Discussion and conclusions: In this pilot study, the collected data suggest that WBV training may be effective in reducing leg spasticity in adults with Multiple Sclerosis, positively influencing their quality of life.

OP080
THE SHORT-TERM EFFECTS OF LASERCANE ON GAIT KINEMATICS IN INDIVIDUALS WITH PARKINSON'S DISEASE

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Introduction: Researchers consistently reported that rehabilitation strategies, in particular, sensory cueing, significantly improve the Parkinson's disease (PD) gait disturbances. The traditional method of visual cueing, i.e., placing stationary taped markers along the runway, can only be utilized in home settings. Hence, a more functional method of visual cueing, Lasercane, has recently been introduced. However, the effects of using Lasercane on the PD gait parameters, specifically, sagittal position of the center of mass (COM) of the whole body and trunk flexion angle, have not been well understood.
Purpose: To examine the short-term effects of using a Lasercane on gait kinematics in PD subjects.
Methods: Ten PD subjects (69.0 ± 7.1 years) performed three walking trials both with and without the Lasercane during "on" state medications. The subjects received a session of gait training with the Lasercane for 45 minutes, 24 hours prior the tests. Qualisys Motion Capture System was used to record the kinematics data.
Results: The subjects walked with a significantly slower velocity (0.33 ± 0.16 m/s vs. 0.61 ± 0.21 m/s $p \leq 0.001$), longer stride duration (2.44 ± 0.92 s vs. 1.29 ± 0.36 s, $p=0.006$), and increased the trunk flexion (15.0 ± 7.32^0 vs. 11.0 ± 6.54^0, $p= 0.009$) in the Lasercane condition as compared to the no-cane one. Using Lasercane had no significant effect on the stride length. Average position of the COM slightly moved anterior when Lasercane was employed ($p>0.05$).
Discussion: The reduced gait velocity in the Lasercane condition may be explained by the relatively short training duration and high cognitive demands during acquisition phase of learning. It has been demonstrated that cognitive loading during walking exacerbates the gait disturbances in PD subjects. Despite the increased trunk flexion, Lasercane may not increase risk of falling during walking as the position of the COM remains almost unchanged compared with the no-cane condition.

OP081
BIO-PROGRESSIVE REHABILITATION PROJECT FOR THE TREATMENT OF CAMPTOCORMIA, POSTURAL INSTABILITY AND GAIT ABNORMALITIES IN PARKINSONISM

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Introduction: Proprioceptive postural instability is often the most common presenting symptom of atypical parkinsonism. It leads to deviations of the column, musculoskeletal pain and risk of falling. Alterations of sensorimotor integration can occur, as an increased reliance on visual and auditory information, so the suppression of visual input and auditory compromise speed and accuracy of movement. External aids, like auditory and visual cues can complete rehabilitation strategies in order to avoid the destruction of the internal "cue" regulating the motor sequence, the increased variability of production of muscle strength and the difficulty in interpretating sensory and proprioceptive feedback during movement.
Aim: Achieve a greater postural control and a use of a diagram of the path more stable and with lesser power consumption associated with an increase of the strength and muscle endurance. All this is to improve the independence and quality of life.
Methods: 10 patients, able to stand alone and to walk independently and not responsive to drug therapy with L-dopa, were selected. The rehabilitation protocol consisted of: Functional training of the gait in micro-gravity with SPAD system associated with a metronome; Focal Vibration; Virtual reality. Patients were evaluated before treatment, every 4 weeks, just after the end of the Protocol and 30 days away from the interruption of the operation and performed a RMF before and after the rehabilitation therapy to evaluate the phenomena induced by neuroplastic rehabilitation protocol.
Results: Results show an improvement in all subjects, in particular the test 10MWT is particularly significant as well as parameters stabilometric. Results about the RMF are ongoing.
Discussion and Conclusions: The evolution of disability in parkinsonian patient requires a complex therapeutic approach which should consider the damage of cortico-proprioceptive-muscular integration.

OP082
MARKERS OF PARKINSON'S DISEASE IN HANDWRITING.

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Introduction: Micrographia is a classical feature in patients with Parkinson's disease (PD).
Purpose: Suggest potential markers of PD from a standardized writing assessment with pen and paper in the OFF state.
Methods: We compared a timed writing task of a standardized sentence repeated three times in 26 patients with PD (72±9 years, 8 female) and 26 age-matched healthy controls (HC, 71±16 years, 8 female). We measured changes in writing speed, sentence length, heights of the first and last Ps, mean inter-words interval and ratio total inter-word interval/sentence length between Sentence 1 (S1) and Sentence 3 (S3).
Results: Raw values were as follows: writing speeds in S1 and S3 were 7.6±2.4 and 8.8±2.6 mm/s in HC (S1 vs S3, p=0.000003) and 6.4±2.8 and 6.5±3.0 mm/sec in PD (S1 vs S3, p=0.65). Height of the last P was 8.2±2.4 and 8.4±2.9 mm in S1 and S3 in HC vs 7.2±3.2 mm and 6.3±3.1 mm in PD (S1 vs S3; $p<0.05$). Mean inter-words intervals were 5.0±1.4 mm and 4.8±1.3 in S1 and S3 in HC, vs 4.8±1.7 and 4.2±1.5 mm in PD. Regarding changes between S1 and S3, differences between the two groups were found for: writing speed was increased more in HC than in PD (p=0.003, ANCOVA); height of the last P decreased in PD while it increased in HC (p=0.012); average inter-word interval decreased more in PD than in HC (p=0.048).
Conclusions: From the first to the last sentence, even though changes in sentence length were not significant in this sample, PD patients cannot increase their writing speed compared with healthy subjects; the height of the last P decreases while it increases in healthy subjects; the average inter-words interval decreases more than in healthy subjects.

OP083
WHEN DO AMYOTROPHYC LATERAL SCLEROSIS PATIENTS DIE?

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Introduction: Respiratory insufficiency (RI) and its complications are the main cause of death of patients with Amyotrophic Lateral Sclerosis (ALS). In most regions, winter is associated with increased risk of death due to respiratory infections, but both heart attacks and stroke are more frequent in that season.
Purpose: Season associated-risk has not been addressed in ALS, the aim of the present study.
Method: From the total ALS population followed in our Unit, we analyzed events (death) and the date of occurrence before January 1, 2015. Patients with uncertain information were excluded. c^2-test was applied to test differences between months and seasons of the year. A value of $p<0.05$ was considered as significant.
Results: From the 777 ALS eligible patients, 543 (69.9%) had died at the censor date. Deaths were as follows 46,46,37,47,38,50,41,43,41,48,40,66, respectively for each month of the year, from January to December. There was no significant difference when considering all months and seasons globally ($p>0.05$). However, when comparing each month with December (the highest death percentage, 12.2%), significant differences were found for the months Mar ($p=0.004$), May ($p=0.006$), Jul ($p=0.016$), Ago ($p=0.028$), Sept ($p=0.016$) and Nov ($p=0.012$). Considering the 4 seasons, there were significantly more deaths in winter than in spring ($p=0.031$) but not between winter and summer ($p=0.16$) or autumn ($p=0.087$).
Discussion and conclusions: December (the coldest month in the North Hemisphere) was the month with highest rate of death, significantly higher than in warmer months and November. Winter was a risk factor for survival in ALS when compared with the spring season. Probably, dehydration is a risk factor in summer. Care in ventilation and cough assist should intensified in winter for ALS patients.

OP084
RESTLESS LEGS SYNDROME IN PARKINSON PATIENTS

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Background: Restless legs syndrome (RLS) is a coPPon neurological condition characterized by uncomfortable and unpleasant sensations in the legs that are relieved by movement. It is frequently idiopathic, sometimes associated with specific disorders such as malignancies. We aimed to evaluate the frequency of RLS in Parkinson Patients (PP) patients and examined the relationship between presence of RLS and depression and anxiety in these patients
Methods: We enrolled a population of 60 adult PP patients for RLS features. RLS was ascertained in PP patients by both the presence of the four essential International RLS Study Group diagnostic criteria and neurological examination. The International RLS Study Group rating scale was used to measure RLS severity. Hospital Anxiety and Depression Scale (HADS) was used to evaluate the levels of depression and anxiety and Short Form-36 (SF-36) to evaluate health related quality of life (HRQOL).
Results: A total of 60 PP patients were evaluated. Among them 29 were identified by the screening questionnaire to meet the criteria for RLS (17.04%). PP patients with RLS had higher levels of depression ($P < 0.01$) and anxiety ($P < 0.01$) and poorer HRQOL compared with those without RLS.
Conclusions: The frequency of RLS in PP patients is higher than that of expected in the general population. PP patients afflicted by RLS have significantly higher levels of depression, anxiety and poorer HRQOL. Recognition and treatment of RLS in PP patients may be an important target in clinical management and may improve overall health outcomes in these patients.

OP085
REALITY OF A HOSPITAL WITH A MULTIDISCIPLINARY AMYOTROPHIC LATERAL SCLEROSIS TEAM

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Introduction: Amyotrophic Lateral Sclerosis (ALS) is a progressive and rare neurodegenerative disease, characterized by loss of motor neurons in the spinal cord, brainstem and motor cortex. This disease requires a multidisciplinary approach including symptomatic management, rehabilitation to maintain motor function, respiratory support, nutritional support, palliative care and psychological support.
Purpose: Characterize a group of ALS patients followed by a multidisciplinary team with specialists of Neurology, Pneumology, Physical Medicine and Rehabilitation, Gastroenterology, Psychology and Nutrition.
Method: A descriptive retrospective study was made using the data from patients with ALS in a hospital with a multidisciplinary neuromuscular team from 2012 until 2015, emphasizing invasive intervention criteria.
Results: During this period 24 ALS cases were followed (13 men and 11 women). Median age was 62.58 years old. Most patients started the disease on the limbs and a smaller group on the bulbar area. All patients were treated with Riluzole. All of them except one were submitted to non-invasive ventilation; 18 patients were treated with cough assist; 2 underwent tracheostomy. Percutaneous endoscopic gastrostomy was placed in 10 patients, while 17 required thickening agents for dysphagia management. The decisions and timing of these interventions are debated in mensal interdisciplinary reunions, based on local protocols. All patients were confronted with progressive physical impairment, in need with assistive devices. Fourteen underwent rehabilitation treatment. All required psychological support. Seven patients needed pain management. Nine patients died, with an average survival time since diagnosis of 2 years. Leading cause of death result from respiratory complications.
Discussion and conclusions: With this work we intend to draw attention to the importance of a multidisciplinary team to improve communication between the different specialities thereby facilitating decision-making and to optimize health care delivery in ALS patients.

OP086
SENSORIMOTOR ADAPTATION TO BALANCE AND GAIT IMPAIRMENT IN ATAXIC PATIENTS

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Purpose of the research: Patients with ataxic neuropathy show proprioceptive sensory deficits and they tend to compensate their deficits increasing the use of visual inputs. In order to have a complete analysis of sensory compensations of these patients, in the balance and posturography field, we aim to assess them in three balance conditions: static, dynamic and during gait.
Methods: Twenty ataxic patients and twenty healthy subjects ranged by age were selected. We used a static force platform (Satel) for the static balance analysis using the Limits of equilibrium (LE) parameter, experimental dynamic robotized force platform for the dynamic balance evaluation during a sinuisodal protocol, five exercises repeated for five frequencies (0.1Hz to 0.5Hz), and the eye-tracking technology to assess gaze direction and visual compensation during gait which protocol consists of walking in three different corridors wearing the eye-tracker. Statistical analyses were conducted in StatView®, to compare the groups we used ANOVA and the post hoc Fisher test.
Results: First results show a statistical significant difference between patients and health subjects in all three protocols. In the static condition we tried to separate sensory and motor deficits and we observed that motor impairment is more sensible to the LE parameter. In the dynamic condition we analyzed the CP area and the patients were more instable in low frequencies (0.1Hz; 0.2Hz). And for the eye-tracking analysis we measured the time spent looking at the floor and we noticed a visual strategy during gait.
Discussion and conclusions: Ataxic neuropathy leads to balance and gait impairment. We tried to characterize the deficits and strategies of these patients using the experienced and new technology. The first results motivates us to continue the research into static and dynamic posturography and the eye-tracking technology to better develop training programs for ataxic patients

OP087
PREVALENCE AND PREDICTORS FACTORS OF HETEROTOPIC OSSIFICATIONS IN PEOPLE WITH SEVERE ACQUIRED BRAIN INJURY IN INTENSIVE REHABILITATIVE UNIT: A NATIONAL MULTICENTRIC OBSERVATIONAL CROSS SURVEY

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Introduction: Heterotopic Ossifications (HO) in severe Acquired Brain Injury (sABI) seem to have a different distribution in intensive rehabilitation units. Evidence are no uniqueness in the determinants: severity of the traumatic injury, autonomic dysregulation, coma or mechanical ventilation duration, fractures surgically treated coexistence, while some clinical care pathway aspects (such as the interval time between acute event and admission in rehabilitation), are almost absent.
Purpose: A prevalence study, in sABI people admitted in intensive rehabilitation units, trying also to detect what are the clinical and pathway factors influencing the HO presence.
Method: We studied adult (≥18) sABI patients admitted (first admission) on the date of May 28, 2015 in 48 rehabilitation units of 19 italian regions. For each patient, we verified the HO presence and number and we collected several clinical and pathway data, among wich: sABI date and severity, admission date in rehabilitation unit, etiology, coma and mechanical ventilation length, specific mobilization in acute phase, LCF, DRS, alkaline phosphatase and serum calcium at the survey date, autonomic dysregulation and spasticity presence and other.
Results: We investigated a total amount of 697 sABI persons, 95 of which (14%) had one or more HO (53% single, 39% two and 10% three or more). Anoxic and traumatic etiology distribution has a different statistical weight between group with (W) and without HO (O). We also found significant differences between W and O group for: -interval length (dd) between the sABI and rehabilitation admission; -mean and median coma and mechanical ventilation length; -specific mobilization performed in acute phase; -autonomic dysregulation and spasticity (ash≥ 3) presence.
Conclusions: The HO prevalence can be considered a complication still significant (14%) in the sABI population. The predisposing factors appear to be related to the coma and mechanical ventilation length, the spasticity and autonomic dysregulation presence, while a short time interval between the acute event and rehabilitation admission and early and regular mobilization in the ICU phase seem to be protective factors.

OP088
COGNITIVE RECOVERY AFTER SEVERE TRAUMATIC BRAIN INJURY: 2 YEARS PROSPECTIVE STUDY

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Introduction: Severe traumatic brain injury (TBI) can have a profound impact on patients and family members due to impaired physical, cognitive and social functioning. Cognitive deficits are crucial factors of disability.
Purpose: To evaluate cognitive recovery in a cohort of severe TBI patients first admitted in a comprehensive inpatient rehabilitation program irrespective of the time since event. Also to identify possible recovery variables.
Methods: We conducted a prospective cohort study with severe TBI patients from an inpatient rehabilitation program in a Rehabilitation Centre between August 2013 and August 2015. Functional Independence Measure (FIM) cognitive subscale was applied at admission and discharge to evaluate the cognitive recovery. Wilcoxon signed-rank test was used to analyze the significance of cognitive FIM subscale gains. Spearman correlation and Mann-Whitney test were used to examine the association of clinical and sociodemographic factors with total cognitive FIM gain.
Results: The study included 25 patients, 88% male, median age 39, 76% with secondary level schooling. Motor vehicle accidents (68%) were the most frequent etiology and mean initial GCS was 5. At admission, the prevalent cognitive deficits were processing information speed (95.2%), memory (90.9%), executive functions (90.9%) and attention (81.8%). There was a statistically significant gain in total FIM cognitive subscale and in all five individual subscale tasks ($p<0.05$). From all the analyzed variables, only sleep medication was associated with total FIM cognitive gain ($p=0.04$).
Discussion and conclusions: The study showed patient improvements in all FIM cognitive subscale tasks, therefore increasing their functionality in basic daily activities, possibly diminishing burden of care. This supports the efficacy of our inpatient rehabilitation program, independently of time post-TBI. Important limitations were: a small sized sample and the lack of other key activities or participation elements of cognitive recovery in FIM.

OP089
THE BEAUTIFUL MIND

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Introduction: Traumatic brain injury (TBI) is caused by sudden external damage to the brain. Its consequences are well known and may include physical, sensory, cognitive-communication, and behavioral issues. If we can make a standardization with the clinical presentation of problems related with the heart or lungs, for example, the same isn't real for TBI. Each person is different, thanks to the uniqueness of his brain function. That's why each TBI will have a unique clinical behavior, mainly in what refers to cognitive and communication deficits.
Purpose: The purpose of this paper isn't make an exhaustive revision about TBI, but describe some clinical episodes in which we could witness the incredible cerebral mechanisms that allow us to think, make connections between our memories and our daily life and get new knowledge.
Clinical Cases: We will describe different cases with different impairments and communication deficits using an unusual approach in which we'll show the complexity of (and how much science doesn't know yet) the human mind. In all the cases there were no motor consequences from the TBI and the neurocognitive impairments leaded to otherwise comic situations, resulting from the motor aphasias and the most original interpretations of the hospital environment, based on each patient unique background. From the patient who called a "ford fiesta" to the doctor's pen to the one who thought the doctor was an IT worker due to the time she spent on the computer, we'll give an insight to the beauty of the human mind mechanisms.
Conclusions: The specific deficits resulting from TBI are mainly diagnosed and managed by an interdisciplinary team. It is important that the physician would be alert to the different needs of this individuals and be able to respond correctly to their specific requirements.

OP090
OPTIMIZING CIRCADIAN RHYTHM AND CHARACTERIZING BRAIN FUNCTION IN DISORDERS OF CONSCIOUSNESS

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Objective: Sleep is a physiological state where memory processing, learning and brain plasticity occur. Patients with prolonged disorders of consciousness (PDOC) show none or minimal sign of awareness of themselves/ their environment but appear to have sleep-wake cycles. This research study aims to answer the following questions:
1. Do the patients in PDOC maintain any circadian rhythm? If so, is it normal?
2. If not, can we improve it by using simple and inexpensive clinical interventions namely light, melatonin and caffeine?
3. Could these interventions lead to improvement of consciousness/ brain functions?

Methods: 10 people with PDOC, 2 to 8 years after brain injury were included in the study (5 female, age 30-71). Coma Recovery Scale-revised (CRS-R), 24-hour polysomnography (PSG) and 4-hourly saliva melatonin measurements were performed twice at baseline and again following intervention. Intervention was consist of melatonin treatment at night and blue light therapy and caffeine treatment in the morning for five weeks. The PSG data were collected using an ambulatory EEG system. Detailed visual inspection and micro-structure assessment of sleep recording were performed in order to score sleep stages. Melatonin results were analysed with cosinor analysis.

Results: Baseline sleep architecture was abnormal in all patients. With intervention, improvement of sleep stages and/or sleep-wake patterns were detected in 8/10 patients. Cosinor analysis of saliva melatonin results revealed that averaged baseline % rhythmicity was low. (Mean: 31%, Range: 13% - 66.4%, SD: 18.4). Increase in % Melatonin Rhythm following intervention was statistically significant (p=0.012). Paired samples T-test revealed statistically significant improvement of CRS-R scores with intervention(p=0.034).

Conclusions: Sleep and circadian rhythms are severely deranged in PDOC. Clinical intervention with melatonin, caffeine and blue light treatment led to improvement of all physiological parameters measured- and most importantly of CRS-R scores. Further studies with increased number of patients in earlier stages of PDOC are required.

OP091
EFFECT OF A SPECIALLY DESIGNED DANCE ROUTINE ON COGNITIVE FUNCTION IN OLDER ADULTS WITH MILD COGNITIVE IMPAIRMENT A RANDOMIZED CONTROLLED TRIAL

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Introduction: Previous studies showed that moderate-intensity exercise is associated with a decreased risk of cognitive impairment.
Purpose: To evaluate the effect of a specially designed dance routine on cognitive function in individuals with Mild cognitive impairment (MCI).
Method: This is a single-blinded randomized controlled trial. Subjects with MCI were randomly assigned to receive either a moderate-intensity exercise therapy or usual care for 3 months. After 3 months, all patients received usual care. The exercise therapy was a specially designed dance routine which involved cognitive effort for patients to memorize the complex dance movements. Patients receiving exercise therapy danced together for 40 minutes each time with 3 times a week for 12 weeks under the monitoring of physical therapists. Wechsler Memory Scale-Revised (WMS-R) and Trail Making Test (TMT) - A and B were used to assess the cognitive function of each patient at baseline, 3 months, and 6 months follow-up.
Results: Twenty-nine patients received exercise therapy and 31 patients received usual care. Multiple regression models showed that exercise therapy was associated with a greater memory improvement measured using the Wechsler WMS-R at 3 months (coefficient = 4.7, 95% confidence interval (CI) = 2.2, 7.2, p-value < 0.01) and 6 months (coefficient = 3.32, 95% CI = 0.79, 5.85, p-value =0.01). In addition, the exercise therapy was also associated with a greater improvement in cognitive processing speed measured using the TMT-B (coefficient = -34.7, 95% CI = -63.1, -6.3, p-value = 0.02) at 3 months.
Discussion: Dance not only incorporate physical and motor skill related activities, but it also engage various cognitive functions such as perception, emotion, and memory.
Conclusions: This specially designed dance routine as a moderate intensity exercise significantly improved patients' memory after 3 months exercise therapy and this positive effect lasted even after the exercise therapy was completed.

OP092
FIBROMYALGIA AS A DISTURBANCE OF MUSCLE MEMBRANE. ARE THERE IMPLICATIONS FOR TREATMENT?

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Introduction: Fibromyalgia (FM) is a condition with unknown etiology, characterized by chronic widespread pain, and accompanied by symptoms such as fatigue and sleep disturbances. The prevalence of FM is high and the impact on the functioning of the patients is large. It is generally accepted that, in FM, there is a dysregulation of central neural mechanisms (sensitization) resulting in augmented pain sensation. However, FM (which literally means 'pain in connective tissue and muscles') may especially involve muscles.
Purpose: To investigate whether there are function disturbances in the muscles of FM patients and whether these correlate with pain.
Methods: Using surface electromyography, a muscle fiber conduction velocity (CV) was measured on a non-painful biceps brachii of 23 women with FM (mean age 44 y) and 16 healthy age-matched female controls (mean age 45 y). The experiment was under static conditions; the arm was unloaded, and loaded by 5%, 10% and 20% of maximum voluntary contraction force. In participants, 18 standardized body sites (tender points = TPs) were examined, and the TP score was calculated.
Results: The CV was faster in FM patients than in controls ($P < 0.05$). There was also a positive correlation between the CV and TP score ($r = 0.479$, $P < 0.01$). The faster the CV the higher TP score.
Discussion and conclusions: Skeletal muscle membrane of FM patients is functionally disturbed: the propagation of its action potential is too fast. Such a membrane is physiologically hyperactive: it discharges easier. The disturbance occurs in non-painful muscles, suggesting skeletal muscles in FM overall being affected. The finding that the grade of membrane disturbance is correlated with pain level suggests that the disturbed membrane may contribute to muscular (TP) pain: the muscles would be activated too readily. Possible implications for patient teaching and choice of treatments are discussed.

OP093
APOPTOSIS AND NEKROSIS-INDUCING CELL CYTOTOXICITY OF ROPIVACAINE, BUPIVACAINE AND TRIAMCINOLONE IN FIBROBLASTS, TENOCYTES AND HUMAN MESENCHYMAL STEM CELLS

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Introduction: local anesthetics and cortisone are frequently preferred for intraarticular pain management and in arthroscopic surgery.
Purpose: to analyze cell cytotoxity of ropivacaine, bupivacaine and triamcinolone in fibroblasts, tenocytes and human mesenchymal stem cells (hMSC) regarding apoptosis and necrosis inducing effects.
Method: the cell lines were incubated in DMEM reaching cell density of $10^4/cm^2$. Ropivacaine, bupivacaine and triamcinolone was added in varying concentrations of 0.5, 0.25 and 0.125 per cent. DMEM was used as negative control. The incubation period was 30 minutes. After medium change and 1 hour, 24hours and 7 days of incubation, cells were harvested and analyzed via FACS using double-staining with Annexin V and PI. In flow cytometry, Annexin V stains apoptotic cells while PI enables necrotic cells to be differentiated.
Results: Bupivacaine shows in comparison to ropivacaine and triamcinolone necrosis-inducing effects on all cell lines, the cytotoxic effect increasing with the concentrations. Ropivacaine causes more necrosis in tenocytes and no effect in fibroblasts and hMSC. Triamcinolone is overall cytotoxic and necrosis-inducing in all cell lines. While the necrosis in ropivacaine and bupivacaine decreases after 24h and 7d, the cytotoxic effect of triamcinolone remains even after 7d almost unchanged. Apoptosis-induced cell cytotoxy was not dependent on different cell lines, varying concentrations or time measurements.
Discussion and conclusions: our results advise to prefer ropivacaine over bupivacaine in clinical use, although cytotoxity in tenocytes suggest careful evaluation in arthroscopic ligament reconstruction. Furthermore, concentration of anesthetics and cortisone should be kept as low as possible, especially if a combination of both are used for injection therapy in pain management and arthroscopic therapies.

OP094
INFRARED THERMOGRAPHIC PATTERNS OF LOWER LIMB COMPLEX REGIONAL PAIN SYNDROME TYPE I AND ITS CORRELATION WITH PAIN, DISEASE DURATION AND CLINICAL SIGNS

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Introduction: So far existing studies have not validated infrared thermography primarily in lower limb CRPS patients.
Purpose: The aim of this study was the assessment of the absolute temperature asymmetry by infrared thermography in patients with CRPS Type I of the lower limb according to the Budapest clinical criteria. To investigate whether there are correlations between the amount of temperature asymmetry, pain and clinical signs.
Method: 25 women and 11 men (mean age 48 years), who fulfilled the Budapest clinical criteria of CRPS Type I, were investigated in this retrospective cross sectional study. Infrared thermographic evaluation of the big toe, dorsal foot, ankle and distal anterior lower thigh was performed. The arithmetical mean of the absolute side-to-side differences of these four regions of interest was calculated. The correlation of the absolute temperature side difference with pain, duration of the disease and clinical signs (sensory, vasomotor, sudomotor/edema and motor/trophic) was assessed.
Results: The average absolute side-to-side temperature difference of the distal leg was 1,6/1,2°C (mean/SD). A significant correlation between the temperature asymmetry was observed with the vasomotor signs.
Discussion and conclusions: Infrared thermography offers an objective assessment of vasomotoric dysfunction in CRPS Type I of the lower limb, and therefore serves as a useful supplementary tool in the diagnosis of CRPS Type.

OP095
REHABILITATION OF BILATERAL LOWER LIMB AMPUTEES: REALITY OF A SECONDARY CARE HOSPITAL

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Introduction: Bilateral amputation is a challenge in rehabilitation, usually needing a more intense or prolonged period of rehabilitation. Goals in rehabilitation of these patients are usually related to their age, level of amputation, etiology of amputation/concurrent diseases and successful prosthetic use after first amputation.
Purpose: To assess the prevalence, characteristics and prosthetic use in bilateral lower limb amputees in a secondary care hospital.
Method: Retrospective and descriptive longitudinal study from the archives of clinical assessments of lower limb amputees evaluated and treated at our department. Statistical analysis was obtained using SPSS 19.0.
Results: From a total of 501 lower limb amputees treated in our department, 68 (13,6%) were bilateral lower limb amputees. They were predominantly male (72,1%) and with an average age of 63,7 years (±12,8) at the time of their admission for treatments.Etiology of amputation was predominantly vascular (40 secondary to diabetes and 20 to atherosclerosis) followed by infectious (5 patients) and traumatic (3 patients). In this sample, 22 amputees had bilateral transtibial amputation, 17 bilateral transfemoral, 17 transtibial and transfemoral, 9 partial foot and transtibial, 2 partial foot and transfemoral amputation and 1 had bilateral knee disarticulation. From all the bilateral lower limb amputees 42,6% were prosthetized. Excluding the single case of knee disarticulation (which was able to be adapted to prosthesis), patients with lower amputations were more frequently able to reach prosthetic use than the ones with higher amputation (78% of partial foot and transtibial amputation vs 18% of bilateral transfemoral amputation).
Discussion and conclusions: The slightly lower prosthetization ratio in our sample, when compared to some other studies, is probably due to the age and etiology of amputation (and cardiovascular comorbidities associated with them) of our patients. More success in prosthetic use in lower amputations is in order with the literature.

OP096
IMPORTANCE OF PERSONAL RESOURCES IN PSYCHOSOCIAL REINTEGRATION OF PERSONS WITH AMPUTATION OF LOWER LIMB

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Introduction: Lost of limb, amputation, is not only a physical or a health problem, it affects psychological and social functioning of the individual. The aim of rehabilitation, beside medical care and prosthetic rehabilitation is psychosocial reintegration of the individual in the community. For this purpose, especially for war veterans, variety of activities and programs, during rehabilitation and in community were conducted. However, in practice, we are often faced with the fact that these activities do not have the same effect in all individuals. So far little attention has been paid to this problem, in the sense to examine certain features and personal resources that can affect the level of reintegration and general satisfaction with life defined as emotional and cognitive evaluation of one's own life.
Purpose: The aim of the research is to explore the relationship between self concept that represents a experience of self through six subdomains and general picture, stress coping strategies as appraisal, problem or emotional focused and optimism as one of the basic personality traits with assessed levels of social reintegration and general life satisfaction.
Method: The study involved 88 male who have lost one or both lower extremities, caused by wounding, during the war in Bosnia and Herzegovina (1992-1995).
Results: The results show that there is a statistically significant correlation between some self concept subdomains; competence, family and physical as well as the degree of optimism to reintegration and life satisfaction. A statistically significant negative relationship between the degree of reintegration and life satisfaction was found for emotion focused coping response as a way of overcoming stress.
Discussion and conclusion: These results give us guidelines for work with persons with amputation in the sense that is necessary, in addition to rehabilitation and psychosocial support to implement individual psychoeducational programs aimed to improve psychosocial reintegration and increase life satisfaction among persons with amputations.

OP097
OSSEOINTEGRATED PROSTHESES FOR THE REHABILITATION OF AMPUTEES (OPRA): WHAT WE LEARNED WITH OUR RECENT EXPERIENCE

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Introduction: Osseointegration is a term derived from the Greek word osteon, which means "bone", and from the Latin word integrare, which means "to make whole". The OPRA (Osseointegrated Prostheses for the Rehabilitation of Amputees) Implant System is the pioneering treatment for bone anchored prostheses. It is based in decades of extensive research and experience in osseointegration since its discovery in the 1950's by Prof. PI. Brånemark. Hundreds of patients have been treated with this system and keep reporting functionality for up to 20 years after treatment. Osseointegration is thus an alternative method of attaching a prostheses, but is still a rather unusual treatment for patients with limb loss.
Discussion: Literature reports that some of the main reasons for lower-limb amputees not wearing their prosthesis, aside from energy expenditure, were socket-related problems such as discomfort, perspiration and skin problems. Therefore, eliminating the need for a socket could virtually eliminate many of the reasons for not being able to use a prosthesis. Recently our hospital started the use of the OPRA Implant System. We improved our understanding of osseointegrated prosthesis and compared it with socket ones. We analyse all the process of our experience, including the two surgical procedures of the implant system and all the rehabilitation program.
Conclusions: OPRA eliminates pressure, sores and pain in skin and soft tissues, stables prosthetic attachment and increases freedom of motion improving walking ability. But the most important finding is that the change goes beyond the functional gains, integrating the existential implications in the concept of quality of life.

OP098
EFFECT OF PILATES EXERCISE PROGRAM ON PEOPLE WITH CHRONIC LOW BACK PAIN

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Introduction: Non-specific chronic low back pain is a disease entity highly prevalent in developed countries. It not only causes considerable functional decline but also affects the quality of life tremendously. Seventy per cent of low back pain is considered non-specific, which means the diagnoses cannot be attributed to a specific recognizable pathology. The treatment options vary, but are mostly symptomatic. Pilates exercise has gained popularity lately in treating lower back pain for it is considered safe and non-invasive, having less adverse effects when compared to medication or aggressive surgical intervention. It is a promising treatment option for clinicians as well as patients.
Purpose: To investigate the efficacy of a therapeutic Pilates exercise approach in a population with non-specific chronic low back pain (NSCLBP).
Method: A randomized controlled trial, pretest-posttest design, with a 4, 8 and 26-week follow-up conducted in a regional teaching hospital in Keelung, Taiwan. Thirty-nine physically active subjects between 30 and 69 years of age with non-specific chronic low back pain were recruited from the selection process and were divided into two groups. The experimental group participated in an 8-week program consisting of training in a specialized (Pilates) exercise, while the control group received the usual care for low back pain. The primary outcome was the reduction of pain. Secondary outcomes included degree of disability, as well as quality of life.
Results: Early pain reduction and improvement in quality of life was noted in the experimental group, which was sustained until the end of the follow-up period. There was no significant improvement in the diminishing degree of disability.
Discussion and conclusions: Pilates exercise is an effective and prompt therapeutic approach to ameliorate the pain and improve the quality of life in patients with non-specific chronic low back pain.

OP099
PESSIMISM AND OPTIMISM AND THEIR INFLUENCE ON THE TREATMENT OUTCOME OF LOW BACK PAIN

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The pessimism and optimism may be the prognostic indicators for the treatment success in the patients with low back pain (LBP).
Aim: The aim was to evaluate the influence of patients' expectations, i.e. pessimism and optimism, on the treatment outcome of the LBP.
Material and Methods: The study included 63 patients with LBP, 30 (47.6%) men and 33 (52.4%) women, mean age 48.97 ± 10.49 years. The pain duration before the treatment was 6.7 ± 2.2 weeks. Patients were treated with standard procedures during 4.4 ± 0.5 weeks. At the start the patients were divided into two groups: the "optimistic" group which expected recovery of over 50% (43 patients, ie. 68.3%) and "pessimistic" group (20 patients, ie. 31.7%) which expected recovery up to 50% or less. For the evaluation of treatment effectiveness were used: visual analog scale (VAS) for pain and the Oswestry Disability Questionnaire (ODQ) for disability.
Results: Before treatment the values of VAS and ODQ were not significantly different in the "optimistic" group v.s. "pessimistic" group (VAS 7.2 ± 1,7 v.s. 7.4 ± 1.8 , and ODQ 53.7 ± 7.3 v.s. 55.4 ± 8.9), but after treatment the results were significantly better in the "optimistic" group: VAS 1.8 ± 0.5 v.s. 2.9 ± 1.1 ($p < 0.01$), and ODQ 23.7 ± 5.4 v.s. 30.8 ± 6.5 ($p < 0.01$).
Conclusions: The pessimism may reduce the effectiveness of therapy in patients with LBP and therefore it should be timely detected and if possible eliminated.

OP100
FEAR AVOIDANCE BEHAVIOUR AND PERCEIVED EXERTION OF LOW BACK ARE ASSOCIATED WITH PAIN INTENSITY, PHYSICAL FUNCTIONING AND WORKABILITY IN FEMALE NURSES WITH RECURRENT NON-SPECIFIC LOW BACK PAIN.

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Introduction: Among health care workers, the one year prevalence of low back pain (LBP) has been found to be high (up to 77%). The prevalence of LBP is higher on physically demanding jobs. As LBP becomes chronic psychosocial factors are emphasized. The role of them are well known in chronicity, but their role in recurrent stages is not clear.
Purpose of the study: To assess characteristics of LBP in a sample of female able-bodied health-care personnel with recurrent non-specific LBP (NLBP) using ICF-model as framework. To identify physical, psychosocial and contextual factors, which would associate with recurrent LBP, functioning and workability and subsequently mediate the risk of chronicity and loss of workability on selected participants.
Methods: Cross-sectional study of baseline data of Nurse RCT (clinical trial registration NCT04165698). Participants (n=219) are female nurses, 30-55 years of age, experiencing recurrent NLBP. Main outcomes of this study were perceived pain, physical functioning, and self-reported workability. Bivariate analyses were first used to identify associations of the outcome measures to other characteristics. Second, statistically significant ($p<0,05$) associations were further analysed by general linear models.
Results: Fear avoidance behaviour and perceived exertion of the back were associated with all main outcomes. Multiple pain was associated with bodily pain and physical functioning. Fitness in modified push-ups associated with physical functioning and workability and running figure of eight on former also. Depression and recovery from work were associated with workability.
Discussion and conclusions: Results show that biopsychosocial factors are relevant not only in chronic stages of pain, but also in recurrent NLBP when studied participants are still able-bodied and attending working-life. Better identification and categorization of underlying factors which account for perception of pain or disability, may help target to interventions more efficiently. Further research is needed to study causality of discovered factors on functioning and workability.

OP101
CARDIAC REHABILITATION IN HIV-INFECTED PATIENTS

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Introduction: Coronary heart disease (CHD) is an emerging area of concern in HIV population, becoming an important cause of morbidity and mortality. An accelerated atherosclerotic process has been suggested in HIV patients and its pathophysiology is complex and multifactorial. Traditional cardiovascular risk factors are overrepresented in this population. Antiretroviral combination therapy, particularly protease inhibitors, is associated with premature manifestation of CHD. Recent data suggest that HIV infection itself may also increase cardiovascular risk by promote a chronic inflammation and immune activation, that could lead to endothelial dysfunction.
Purpose: To assess the effects of a cardiac rehabilitation program on cardiovascular risk factors and functional capacity in HIV infected patients and compare it with non-HIV patients.
Method: Prospective cohort study that included patients with CHD and HIV consecutively referred for a comprehensive Cardiac Rehabilitation Program between January 2009 and September 2015. Patients were evaluated at three moments: baseline (first visit), 3 and 12 months. The outcome measures were cardiovascular risk factors and functional capacity (achieved in treadmill stress test).
Results: A total of 20 HIV patients participated in the program during the studied period. These subjects had similar cardiovascular risk factors frequencies to those without the infection. There was a statistically significant improvement in all the studied parameters after 3 months ($p<0.0001$), but not at 12 months ($p>0.05$) in HIV population. The program dropout rate was higher (40%) among HIV population compared with the non-infected individuals (17.3%).
Discussion and conclusions: To our knowledge, this is the first report showing the results of a cardiac rehabilitation program in HIV population. This population profile is favourable to higher rates of cardiovascular risk factors and to a non-compliance behaviour in educational programs. Efforts should be made to reverse cardiovascular risk factors and improve participation and attendance of HIV patients on cardiac rehabilitation programs.

OP102
INSPIRATORY MUSCLE WEAKNESS IN CHRONIC HEART FAILURE PATIENTS

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Introduction: Inspiratory muscle weakness has been associated with fatigue and exercise intolerance amongst chronic heart failure (CHF) patients and also has a predictive role in cardiovascular morbidity and mortality.
Purpose: Establish the association between inspiratory muscle strength and different socio-demographic, clinical and psychosocial characteristics in CHF.
Method: Retrospective analysis of 32 CHF patients admitted to a cardiac rehabilitation program between September 2013 and June 2015. Data was abstracted from clinical records. We used mean and standard deviation, for continuous variables, and proportions for categorical variables. Comparison between groups was performed using qui-square testing for qualitative and ANOVA analysis for quantitative variables. MIP values were categorized into 3 groups: G1: lower than 70%, G2: 71 and 90%, and G3: higher than 90%.
Results: The mean MIP was 90,1%±27,24 and the mean MEP was 94,0%±21,23. MIP was lower in those with a past history of coronary disease (p=0,01). There was a trend towards lower maximum volume ventilation (G1: 78,3±34,3 vs G2: 91±10,9 vs G3:, 108,7±28,9) and lower functional capacity in those with lower MIP [baseline exercise testing- duration: G1: 4min:28sec vs G2: 05min:59sec vs G3: 06min:15sec; intensity: G1: 5,0±1,7 vs G2: 6,6±1,9 vs G3: 6,9±1,7]. There was no between-group difference according to CHF etiology, NYHA class, smoking, body mass index and quality of life.
Discussion and conclusions: Association between MIP and functional capacity, a strong predictor of outcome in CHF, is suggested although mechanistic explanations need further evaluation. Inclusion of MIP assessment in these patient groups should be widely recommended.

OP103
RESPONSE TO EXERCISE TRAINING IS NOT PREDICTED BY EXERCISE OXYGEN PULSE PROFILE

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Introduction. The gain of peak VO2 after exercise training has prognostic value in CHF patients. The predictive factors influencing this response remain debated. As oxygen pulse is correlated with the stroke volume , it could reflect cardiac adaptation during exercise. The aim of this study is to evaluate the cardiac function in benefits of exercise training (ET).
Method. We included prospectively 53 CHF patients (mean age 57±12 years, LVEF 29±6%) who underwent two cardiopulmonary exercises (CPX): before and after 20 endurance exercise training sessions. We analysed for the two CPX heart rate, workload, VO2, oxygen pulse and calculated stroke volume and cardiac output at rest, anaerobic threshold (AT) and peak exercise. We measured BNP levels before and after the exercise training program. Patients were considered as responders if the gain of peak VO2 was >10%.
Results. Mean change in peak VO2 after exercise training is 17% for global population, 36% for responders (n=27) and -4% for non responders (n=26). At baseline, responder patients have a lower workload at AT and at peak exercise (52.6±19 vs 62.2±17 watts, p=0.035 and 68.9±28 vs 86.6±27 watts p=0.035); a lower peak oxygen uptake (14.8±4.8 vs 17.5±4.6 ml/kg/min p=0.04), a chronotopic incompetence (max heart rate 99.8±19.8 vs 116±25b/min p=0.01), a lower maximal cardiac output (6.6±2.5 vs 8.0±2.3l/min p=0.019) and a higher BNP serum level (median 506 vs 279 pg/l p=0.019). However oxygen pulse trends or left ventricular function do not influence changes in peak VO2 at any time and regardless of the training type (continuous vs interval training).
Conclusions. Cardiac adaptations in CHF patients do not seem to play major role in the response to exercise. Benefits of exercise training on exercise tolerance in CHF patients are mainly due to peripheral improvements.

OP104
CLINICAL TRIAL IMPLEMENTATION TO IMPROVE VENOUS LEG ULCER HEALING

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Introduction: Venous leg ulcers (VLUs) are chronic, painful wounds on lower limbs that impact on mobility, daily living and quality of care. The global burden of care in rehabilitation and community settings is increasing with an ageing frail population and in younger people with disbaities with the growing epidemics of diabetes and obesity. Best practice treatment to aid healing in chronic VLUs is compression although we have found 50% remain unhealed with best practice compression, possibly due to a prolonged inflammatory response. Aspirin is a widely used drug that has several actions potentially capable of influencing healing. Data suggest a daily dose of aspirin (300mg) may speed healing rates and prevent VLU recurrence.
Purpose: To report on two clinical trials in venous leg ulcer research in Australia. The 3vSS compression study and the ASPirin in Venous Leg Ulcer (ASPiVLU) study to assess time to healing.
Method: The ASPiVLU study, a double blind placebo controlled randomised controlled trial (RCT) will build on our previous compression RCT (3VSS) to assess if aspirin in addition to compression therapy improves time to healing. Recruitment from Australian wound clinics, rehabilitation centers and community care settings.
Results: We will report on 45 participants from wound clinics in Australia. We measured time to healing from baseline to week 12. A total of 27 ulcers healed (17/23 [74%] vs. 10/22 [46%]) ($p = 0.05$). Secondary outcomes i.e. proportion of ulcers healed, self-reported adherence to compression health-related quality of life, costs, recurrence rates, and adverse events will be discussed.
Discussion: If proved effective, the low cost of aspirin therapy as an adjunct to compression would make aspirin an affordable preventive agent for VLUs in all countries.

OP105
MUSCLE SELECTION PATTERNS FOR INJECTION OF ONABOTULINUMTOXINA IN ADULT PATIENTS WITH POST-STROKE LOWER-LIMB SPASTICITY INFLUENCE OUTCOME: RESULTS FROM A DOUBLE-BLIND, PLACEBO-CONTROLLED PHASE 3 CLINICAL TRIAL

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Introduction: OnabotulinumtoxinA (300U-400U) is being investigated for the treatment of post-stroke lower limb spasticity (PSLLS) in the ankle; however, the optimal combination of muscles for injection is not established.
Purpose: To identify an optimal muscle selection pattern for onabotulinumtoxinA injection for the treatment of PSLLS.
Method: In a multicenter, phase 3, placebo-controlled study, adults with PSLLS (Modified Ashworth Scale [MAS] ≥3 in the ankle) were enrolled. The 12-week double-blind phase randomized patients to onabotulinumtoxinA (300U, mandatory muscles [gastrocnemius, soleus, tibialis posterior] and ≤100U, optional lower limb muscles [flexor digitorum longus (FDL), flexor digitorum brevis, flexor hallucis longus (FHL), extensor hallucis, rectus femoris]) or placebo. The primary endpoint, MAS change from baseline, and a secondary endpoint, physician-assessed Clinical Global Impression of Change (CGI), were each reported as the average score of weeks 4 and 6.
Results: In the intent-to-treat group (n=468), onabotulinumtoxinA significantly improved ankle MAS (–0.81 vs –0.61; P=0.01) and CGI (0.86 vs 0.65; P=0.012) versus placebo. 211 patients received treatment in the mandatory muscles only; 119 received treatment in the mandatory muscles plus FHL and FDL muscles. Injection of the mandatory muscles alone was not sufficient in improving ankle MAS (P=0.255) or CGI (P=0.576) in all patients, however, it was adequate among those ≤2 years post-stroke (MAS, –1.13 vs –0.62, P=0.019; CGI, 1.24 vs. 0.68, P=0.006). Additional injections into FDL and FHL muscles significantly improved ankle MAS (–0.98 vs –0.52; P=0.002) and CGI (0.80 vs 0.38; P=0.023) versus placebo regardless of their time since stroke. OnabotulinumtoxinA 300-400 U was well tolerated with no new safety findings.
Discussion and conclusions: Additional injections of onabotulinumtoxinA into the toe flexors (FDL, FHL) significantly improved ankle MAS and CGI scores compared with injections into the mandatory muscles alone, particularly when treatment was initiated >2 years post-stroke.

OP106
CLINICAL AND INSTRUMENTAL RESULTS AFTER COMPLETE TIBIAL NERVE NEUROTOMY OF TRICEPS SURAE AND TIBIALIS POSTERIOR NERVES IN ADULT SPASTIC EQUINOVARUS FOOT

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Introduction: Selective neurotomy of motor branches of tibial nerve is a surgical technique to treat spastic equinovarus foot. Nevertheless, there is no consensus about the selection and proportion of nerve branches to be sectionned. The technique mainly described consists in a partial section of triceps surae (TS) motor nerves.
Purpose: The aim of this study is to discuss the efficacy of complete section of TS and tibialis posterior motor nerves.
Method: This prospective study included 16 patients (mean age 38y) with spastic equinovarus foot. Patients underwent a complete section of motor branchs of TS and tibialis posterior nerves. Clinical and instrumental data were collected before and after surgery, between paretic and non-paretic limbs. Clinical data included passive and active ankle dorsiflexion, muscular overactivity, ankle clonus, quality of heel strike while walking and patient's satisfaction. The instrumental evaluation used the F-Scan® in-shoe system (containing pressure sensors) recording a dynamic quantified analysis of the trajectory of center of pressure (anteroposterior AP displacement, lateral deviation LD and posterior margin of foot contact PM).
Results: 7 months after surgery, there were an improvement of passive ankle dorsiflexion ($p=0.0001$), triceps surae spasticity ($p<0.0001$) and heel strike ($p<0.0001$). The instrumental analysis showed a statistically improvement of AP ($p=0,003$) and MP ($p<0.0001$), with no more difference between paretic and non paretic limb on MP ($p=0,44$) after surgery, whereas there was a difference on this parameter between 2 limbs before surgery ($p=0,0006$). Patients' satisfaction was good (7.8/10).
Discussion: Complete section of TS and tibialis posterior motor nerves is a safe and efficient surgical technique, without any side effect reported.
Conclusions: To our knowledge, this is the first study showing clinical and intrumental results of equinovarus foot treated by a complete section of triceps surae and tibialis posterior motor nerves.

OP107
THE SPASTIC VELOCITY THRESHOLD PREDICTS BOTULINUM TOXIN-A TREATMENT OUTCOME IN THE MEDIAL HAMSTRINGS OF CHILDREN WITH CEREBRAL PALSY.

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Introduction: Data collected using an innovative instrumented spasticity assessment (ISA) in the medial hamstrings (MEH) of children with cerebral palsy (CP) shows large variability among subjects in the velocity threshold (VT) at which hyperreflexia (spasticity) occurs. Intramuscularly injected Botulinum toxin-A (BTX) is effective in temporarily decreasing spasticity in the MEH, although a large variability in response is reported.
Purpose: To investigate whether the spastic VT pre-treatment can predict the effect of BTX in the MEH of children with CP.
Method: Forteen children with CP (10±2yrs) were measured pre- and post-BTX with 3D gait analysis (3DGA) and ISA. From 3DGA, improvement in knee extension during terminal swing ($Knee_{post}$) was analysed. During ISA, kinematics and electromyography (EMG) were recorded during slow and fast passive MEH stretches. Average normalized root mean square EMG was calculated pre-BTX during slow stretch (pre rms-EMG_{slow}) and post-BTX as the change between slow and fast (rms-EMG_{post}). Muscles with high rms-EMG_{slow} values pre-BTX were categorized as low-VT, those with low rms-EMG_{slow} values, as high-VT. Rms-EMG_{post} and $Knee_{post}$ were statistically compared between low-VT and high-VT muscles. The relationships between pre rms-EMG_{slow} with rms-EMG_{post} and with $Knee_{post}$ were investigated using Spearman correlations (significance $p<0.05$).
Results: Rms-EMG_{post} was lower ($p=0.01$) in those muscles categorised pre-BTX as high-VT. There were significant negative correlations for pre rms-EMG_{slow} with rms-EMG_{post} ($r=-0.63$) and with $Knee_{post}$ ($r=-0.48$) indicating that muscles with low-VT are less likely to respond to BTX, as assessed both passively and during gait.
Discussion and conclusions: Assessment of the spastic threshold in the MEH in children with CP can be used to choose the most effective treatment for the individual patient. The etiology behind the different spastic thresholds requires further investigation.

OP108
THE EFFECT OF COGNITIVE DEMAND ON FUNCTIONAL MOBILITY IN AMBULATORY PERSONS WITH MULTIPLE SCLEROSIS

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Introduction: Persons with Multiple Sclerosis (PwMS) who are ambulatory usually decrease functional mobility as the disease progresses. Additional cognitive demands while ambulating might decrease their ability further, but have not been fully studied in this population.
Purpose: To compare the performance of PwMS in various stages of mobility disability with persons without MS (controls) using the Time-Up-and-Go (TUG) test by itself and with two additional cognitive tasks: repeating the alphabet forward (TUG-Alpha) and counting backwards by 3 (TUG-3s).
Method: 57 controls and 52 PwMS participated in the study. PwMS were separated into three mobility disability groups according to their Expanded Disability Status Scale (EDSS): EDSS=0, 4<edssResults: Performance time increased with increasing cognitive demand from TUG to TUG-Alpha to TUG-3s for all groups ($p<0.001$) and with increasing mobility disability ($p<0.001$). PwMS with EDSS=0 performed similarly to controls, while the two more disabled PwMS were similar to each other and had longer performance times. There was no statistically significant interaction between the TUG tests and EDSS level ($p=0.21$), but individuals with EDSS=6 had longer performance time than all other groups.
Discussion and conclusions: Additional cognitive demands while ambulating increases time to perform the TUG test for controls and PwMS. However, the PwMS with EDSS=0 group has just slightly longer time than controls, showing that the cognitive demands have not been impacted by the disease yet. As mobility disability progresses in PwMS, higher cognitive demand, as imposed by the TUG-3s, shows a greater increase in time to perform. Interventions to improve safety in ambulation under dual tasks conditions might be necessary for PwMS with EDSS>4 when mobility starts to become impaired.</edss

OP109
ARE VISUAL CUES HELPFUL FOR VIRTUAL SPATIAL NAVIGATION AND SPATIAL MEMORY IN PATIENTS WITH MILD COGNITIVE IMPAIRMENT OR ALZHEIMER'S DISEASE ?

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Introduction: Topographical disorientation is a frequent issue in Alzheimer's disease (AD) and Mild Cognitive Impairment (MCI). Virtual reality allows large-scale spatial cognition evaluation and brings several advantages for spatial navigation studies.
Purpose: To evaluate whether visual cues are helpful for virtual spatial navigation and memory in AD and MCI patients.
Method: 17 AD patients (MMSE≥17), 12 MCI patients and 20 age-matched healthy control subjects were included. The virtual environment was 3D reproduction of a Bordeaux district. Two conditions were proposed to subjects: 1) a passive one for which they looked at a path including 5 intersections with one landmark at each intersection, 2) then, an active one for which they had to reproduce it with a joystick. Three navigational aids were proposed: salient landmarks, directional arrows and route map using allocentric representation. A path without visual aids served as control. Navigation time and trajectory mistakes (wayfinding task) were recorded. Recall of free and cued landmarks, landmarks ordering, direction choice at each intersection and path outline choice were assessed.
Results: The ANOVAs revealed a significant group effect for all the tasks evaluated (time, wayfinding task, landmarks free recall, recognition and ordering, direction recall and path outline choice). Healthy controls performed significantly better than AD patients in all tasks and than MCI patients in free landmarks recall, landmarks ordering and direction choice. A significant effect of navigational aids was observed for all the tasks except for the path outline choice. Time of navigation and trajectory mistakes were improved with directional arrows and salient landmarks for all groups. A significant interaction Path*Group was shown in the wayfinding task.
Discussion: Visual cues like directional arrows and salient landmarks may be helpful for spatial navigation and memory tasks in AD and MCI patients and could be used for neurorehabilitation and in augmented reality.

OP110
EFFECTS OF AN INTENSIVE PHYSICAL THERAPY PROGRAM ON THE UPPER LIMB IN PARKINSON'S DISEASE, EVALUATED BY THE FUNCTIONAL SCALE MOUNT SINAI PARKINSONISM IMPAIRMENT RATING (MSPIR)

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Introduction: There is rising interest about neurorehabilitation in Parkinson's Disease (PD), for its symptomatic properties, and for its putative neuroprotective effects. For the upper limb specifically, functional evaluation to date is inadequate. This study aims to assess the immediate effects of 8 weeks of an intensive home therapy program and the effects 3 months after the end of the program.
Method: Thirty seven patients with PD (Hoehn & Yahr, 2-3) followed three weekly sessions of one hour of home physical therapy for 8 weeks. Assessment entailed video recording and timing of upper limb activities, using the Mount Sinai Parkinsonism Impairment Rating (MSPIR) scale, which allows an ecological assessment of upper limb function in 10 tasks of daily life. These measurements were performed at the start and end of 8 weeks of therapy and 3 months after the end of the sessions.
Results: There was a significant increase in the speed of performance of the 10 activities at the end of the program: the total duration of 10 tasks decreased from 202 ± 85 sec at D1 to 182 ± 73 sec at J60 (-8%; p=0.0068). Three months after the end, there was further decrease in performance time, which amounted to -23±7% at 3 months (p=0.024; n=10). At D60 the task duration was improved in 16 of 21 patients (76%; p <0.009) and in 9 of 10 patients at D150 (90%; p = 0.0097, Wilcoxon). The average completion time of each task decreased for all tasks between D1 and D150 (p=0.0019, Wilcoxon).
Discussion and conclusions: In PD, 8 weeks of intensive home physical therapy decrease functional bradykinesia, in tasks of which none was specifically trained during the therapy program. These findings suggest an enhanced dopaminergic input in the nigrostriatal pathways after intensive motor training in PD.

OP111
EFFECTS OF INTENSIVE PHYSICAL THERAPY ON LEVODOPA PRESCRIPTION IN PARKINSON'S DISEASE

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Introduction: It has been suggested that intensity of physical therapy (PT) in Parkinson's disease (PD) may lead prescribing physicians to reduce daily levodopa doses (Frazzitta and al, 2012).
Purpose: We evaluated changes in levodopa prescription after an eight-week, standardized, home therapy program that included the teaching of exercises to promote further guided self-practice.
Method: Thirty-eight patients with mild to moderate PD (Hoehn & Yahr 2-3) benefited from a standardized protocol of intensive home PT, three hours/week for eight weeks, with either conventional PT or an asymmetric motor strengthening program. The study investigator was asked not to interfere with the levodopa prescription during the trial and the treating physician was unaware of the hypothesis. We collected the prescribed levodopa-equivalent daily doses (mg/d) at D1 and D150 (3 months after the end of the program). A formal questionnaire to the physiotherapists also asked to report any subjective functional improvement, intake omission or dyskinesia increase during the program.
Results: Thirty one patients were still followed at D150. The levodopa-equivalent daily dose was 579±414 mg/d at D1 and 522±362 mg/d at D150 (-57±49%; p=0.26, t-test). A major dose reduction was observed for two patients (-300 mg/d and -1500 mg/d). From the questionnaire, physiotherapists reported subjective improvement in 60% of cases, dyskinesia increase in 13%, and levodopa intake omissions in 13%.
Discussion and conclusions: In this sample of patients with mild to moderate PD followed up to 3 months after the end of an intensive PT program, the levodopa prescription decrease was not significant three months after the PT program. Dramatic dosage reductions occurred in 2 cases, while physical therapists noted dyskinesia increase in some patients. Breaking the blind between the two groups will allow us to compare the two techniques for their capacity to lead to decreasing levodopa prescription.

OP112
NORDIC WALKING CAN IMPROVE DYNAMIC STABILITY OF HUMAN GAIT IN PARKINSON'S DISEASE

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Introduction: Activating the upper body during walking, Nordic walking (NW) may be used as an external cueing to improve spatiotemporal parameters of gait, such as stride length or gait variability, in Parkinson disease (PD). Structured gait variability, revealed by the presence of long-range autocorrelations (LRA), was associated to dynamic stability of gait. Dynamic stability has been defined as the ability to maintain functional locomotion despite the presence of internal or external disturbances, which is a feature of healthy locomotor system.
Purpose: To assess beneficial effects of NW on dynamic stability of gait and spatiotemporal gait parameters in PD.
Methods: Fourteen mild to moderate PD patients performed 2×12min overground walking sessions (with and without pole in a randomized order) at a comfortable speed. Gait speed, cadence, step length and temporal organization (i.e. LRA) of stride duration variability were studied on 512 consecutive gait cycles using a unidimensional accelerometer placed on the malleola of the most affected side. The presence of LRA was determined using the Rescaled Range Analysis (Hurst exponent) and the power spectral density (á exponent). To assess NW influence on PD gait, a paired t-test was used.
Results: All patients presented LRA during both walking sessions. However, Hurst and á exponents were significantly higher during NW ($p<0,001$). While gait speed remained unchanged between two walking sessions, gait cadence decreased ($p=0,009$) and step length increased significantly ($p=0,003$).
Discussion and conclusions: This study demonstrates that Nordic walking can improve the dynamic stability of gait in PD. Involving a voluntary intersegmental coordination, such improvement could also be due to the upper body rhythmic movements acting as rhythmical external cue to bypass their defective basal ganglia circuitries. Therefore, Nordic walking may constitute a powerful way to manage gait disorders in PD.

OP113
MODIFIED ONE LEG BALANCE TEST: IS IT PREDICTIVE FOR FUNCTIONAL OUTCOME OF UNILATERAL LOWER LIMB AMPUTEES? PRELIMINARY REPORT

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Introduction: One Leg Balance Test has been found to be a positive predictor of mobility with a prosthesis. It consists of maintaining balance on sound limb for 10s without arm support. We propose the Modified One Leg Balance Test (MOLBT) which consists of measuring the ability to stand on one leg between the parallel bars up to 60s in 3 different modalities: 1) with double arm support 2) with one arm support 3) without arm support.
Purpose: To study the value of MOLBT as predictor of functional outcome in amputees. Method 56 patients with new unilateral transfemoral or transtibial amputation were enrolled. All the subjects performed the MOLBT at admission (T0), after the first (T1), the second (T2), the third (T3) and the fourth (T4) week of rehabilitation based on pre-prosthetic and prosthetic training. The functional rehabilitative outcome was assessed by the 2 Minute Walking Test and the Locomotor Capability Index-5 for motor ability with prosthesis and by the Barthel Index for the overall disability. Correlations were calculated using non parametric Spearman's correlation coefficients.
Results: A positive significant correlation was found between performing the MOLBT without arm support and functional outcome. Subjects that achieved 60s on the balance maintenance obtained better score in the motor ability scales. Subjects that didn't improve after the second week of training on the duration of the balance maintenance had a negative functional outcome.
Discussion and conclusions: These results show that MOLBT without arm support can be used to predict mobility with prosthesis and overall disability. This test could be used in the daily clinical practice to select patients suitable for prosthesis. Further analysis is required to investigate if it has the same predictive value for transtibial and transfemoral amputees.

OP114
PERFORMANCE OF THE ALBANIAN SF-36 VERSION 2 AS A MEASURE OF HEALTH-RELATED QUALITY OF LIFE IN PATIENTS WITH LOWER LIMB AMPUTATION

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Introduction: Lower limb amputation not only affects people's ability to walk and physical activity abilities, but it has an effect on the quality of life due to longer-term implications in varied facets of life.
Purpose: The aims of this study were to investigate the reliability and construct validity of the Albanian SF-36v2 lower limb amputees living in Kosovo and to estimate the impact of lower limb amputation on health-related quality of life.
Methods: A face-to-face survey was conducted with a cross-section of patients with lower limb amputation which were recruited from Department of Prosthetics and Orthotics at the University Clinical Center of Kosovo where they were rehabilitated after amputation. HRQoL was quantified using the Albanian SF-36v2 Health Survey, an internationally validated multi-purpose short-form health survey.
Results: One-hundred and fifty lower limb amputees completed the survey. The Albanian version of the SF-36v2 demonstrated excellent internal reliability and internal construct validity (Cronbach's alpha is **0.959)** so, it meet the standards established by the IQOLA project. Physical Component Summary (PCS=46.34) and Mental Component Summary (MCS=41.64) were below norms for the US general population and the inference from the profile indicating that limb amputation has a greater impact on (MCS) than in (PCS). A respondent is considered ¯At Risk for depression when reported MCS score are at or below 42. The percentage of patients at Risk for depression in our study was 47.3%.
Conclusion: The Albanian version of SF-36v2 performed well and the findings suggested that it is a reliable and valid measure of health related quality of life among the population with lower limb amputation, Also, it is important to identify the factors that influence the HRQoL of lower limb amputees living in Kosovo, so that policies can be developed to lower the burden of this category of population.

OP115
INTRATECAL BACLOFEN PUMP: IMPACT IN HEALTH CARE

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Introduction: Baclofen is a GABA agonist, and its primary site of action is the spinal cord, where it reduces the release of excitatory neurotransmitters and substance P by binding to the GABA-B receptor. Studies show that baclofen improves clonus, flexor spasm frequency, and joint range of motion, resulting in improved functional status. Baclofen may be given orally or by intrathecal pump. Adverse effects of baclofen can be minimized by intrathecal infusion of the drug.
Purpose: Determine and characterize the complications and side effects as well as satisfaction in a population with an Intrathecal Baclofen Pump (IBP)
Method: Retrospective study of all the patients who attend our hospital with a IBP from 1995 to 2015. Sample of 28 patients, 17 presented spinal cord injury, 4 with multiple sclerosis, 3 familial spastic paraplegia, 2 cerebral palsy, 1 traumatic brain injury and 1 stroke. A phone questionnaire survey was preformed to 10 patients and 5 caregivers regarding the improvements in health caused by the IBP
Results: In our sample there were complications related to the surgical procedure and the implanted material, there were also side effects related to the hypotonia. The complications were more frequent in patients with higher neurological levels and complete lesions, as described in literature. The questionnaire results show that most of the patients were very satisfied with the IBP results, including diminished spams, spasticity and pain and most of them agreed that there was a general improvement in their health.
Discussion and conclusions: Despite the complications, the IBP is a safe spasticity treatment and satisfying for most patients.

OP116
STUDY OF THE EFFECT OF BOTULINUM TOXIN TREATMENT OF SPASTICITY ON THE QUALITY OF LIFE.

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Introduction: Botulinum toxin A (BoNT-A) injections for treatment of spasticity in patients diseases such as stroke and cerebral palsy have become common practice in physiatry. Although effective in relieving spasticity, it is an expensive treatment.
Purpose: Study the effect Botulinum toxin A (BoNT-A) injections has on the quality of life and function of patients with spasticity.
Method: Functional Independence measure (FIM) and the WHO QOL-Bref questionnaire were applied to 11 patients at the time of administration of botulinum toxin and one month later. Statistical analysis with t-test using SPSS version 20.0.
Results: There was a statistically significant ($p<0,05$) improvement in FIM scores when comparing the pre and post application results. There was no significant improvement in the different domains of the WHO QOL -BREF.
Discussion and conclusions: It is empirically accepted that improvement in function is related to an improvement in the quality of life. This correlation was not demonstrated in our study. The sample of this study was small. Consideration must be taken on the fact that spasticity appears in context with other manifestations of the underlying pathology. A holistic approach must be used in the treatment of patients with spasticity in order to face the different domains that affect the quality of life.

OP117
GENDER DIFFERENCES IN QUALITY OF LIFE AFTER REHABILITATION FOLLOWING HIP FRACTURE IN GERIATRIC POPULATION

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Introduction: Hip fractures are one of the main factors influencing pore quality of life and even lethal outcome in geriatric population. Devastating consequences combined with increasing incidence made hip fracture as one of the main problems in geriatric population all over the world. It have been demonstrated in previous studies that multidisciplinary rehabilitation reduce pore outcomes in elderly population after hip fracture, but very few of those studies considering gender differences in their quality of life.
Purpose: The purpose of this study was to explore the impact of post acute rehabilitation after hip fracture on quality of life in population above 65 regarding gender.
Method: This research was conducted among 203 respondent referred for post acute rehabilitation) after being operated because of hip fracture at orthopedic wards. Quality of life was measured by SF-36 Health Survey in all 16 categories, and expressed by Physical Health Score and Mental Health Score. Dates were recorded at the day of admission in rehabilitation facility, on discharge, 3 and 6 months after discharge. Data for female and male gender were analyzed separately for all age groups: Group 65-74, Group 75-84 and Group 85-up. Statistical analyses were performed by using Student T test, Man-Whitney test and unifactorial ANOVA.
Results: Our sample had 149 females and 54 males. They were 77, 72 years old in average, 55.2% of them had fracture of femoral neck and 63% had implanted endoprothesis. Performed multidisciplinary rehabilitation program showed significant positive effect on quality of life in both genders an in all age groups during observed period. Male patients and the oldest group had non-significant improvement and in observed parameters after discharge from rehabilitation.
Conclusions: Male sex and age more than 85 years could be considered as risk factors for further lower quality of life after hip fracture, and thus should be individually assessed and continuously monitored.

OP118
COMPARISON OF REHABILITATON OUTCOMES FOR NEUROLOGICAL CONDITIONS: A COHORT ANALYSIS

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Introduction: The Functional Independence Measure (FIM) is a widely accepted scale used to measure functional abilities of patients undergoing rehabilitation. Scores at the extremes of this scale correlate with discharge disposition, while mid-range scores are less well understood. This study evaluated the rate of FIM change with time ("efficiency"), admission and discharge FIM scores, and discharge disposition.
Purpose: To compare outcome from in-patient rehabilitation across different groups of neurological conditions
Method: Data from 116 patients who underwent neurological conditions inpatient intensive rehabilitation from September 2014-September 2015 were extracted (Stroke, Acute Brain Injury, Acute Spinal Cord Injury, Polyneuropathy and Guillain-Barré Syndrome, "progressive/Stable" conditions). Outcome variables included FIM efficiency and it´s correlation with discharge destination.
Results: Lenght of stay (LOS) ranged from 15-93 days (mean 34,83; SD 17,63). There was no significant correlation between admission FIM score and LOS (rho -2,56), or significant differences between-group in LOS (z 1,05, p=0,421). FIM efficiency ranged from -1,38 to 2,19 unit/day (mean 0,54 SD 0,54). Change between admission and discharge FIM ranged from -29 to 57 units (mean 16,34 SD 15,75). There was no significant differences between-group for FIM efficiency (kruskal-Wallis p=0,179) and change between admission and discharge FIM (Kruskal-Wallis p=0,118). All five groups showed statistically significant change (t 11,32,p<0,001) between admission and discharge FIM scores. Significant discharge FIM scores were observed between discharge to a facility or return to home (t 3,24, p=0,002).
Discussion and conclusions: All groups made gains in independence during rehabilitation, without apparent change of pattern between conditions. FIM of patients returning home were better than patients discharged to a facility, with a corresponding reduction in care needs ando on-going costs in the community, correlating with needs for care and nursing.

OP119
QUALITY OF LIFE OF ADULTS WITH CEREBRAL PALSY LIVING IN BRITANNY

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Introduction: Just a few studies have been published about health related quality of life of adults with cerebral palsy and no at our knowledge in the French population. The objective of this study is to obtain an image of health related quality of life of BreizhPC network users.
Methods: A questionnaire was sent to all network users. This questionnaire concerned the people living: work, leisure, clinical complaints, as well as a self SF36 quality of life questionnaire. The SF-36 quality of life give information in different fields: physical activity, emotional life, vitality, general health. The questionnaires were analyzed according to the disability, the influence of social status, level of disability and major clinical disorders. The statistical analysis used the student test.
Results: 800 questionnaires were sent out, 173 users responded, 81 women and 92 men, with a mean age of 42. That represent 22 % of the contacted population. The data from 115 people have been exploited. The average age of the population is 42 years. The level of motor disability, travel difficulties, sleep disorders, pain, urinary and transit disorders negatively influence the quality of life. On the other side, sex, employment, epilepsy, communication and swallowing disorders, active sexuality had no influence.
Discussion and conclusions: Our results are closed to the literature with some variations, they emphasize the decrease in quality of life in adults with cerebral palsy. Some factors appear more important and require definitely more attention to improve the quality of life experienced by patients: travel difficulties, pain, urinary and transit disorders and sleep disorders.

OP120
REHABILITATION OUTCOME OF PATIENTS WITH BILATERAL LOWER LIMB AMPUTATION

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Introduction: The level of amputation is one of the most important factors in predicting rehabilitation outcome in lower limb amputees. Other important factors for rehabilitation outcome are: age of the amputee, the reason for amputation-mostly peripheral arterial vascular disease, comorbidity, patients cooperation in rehabilitation program.
The aim of our study was to evaluate the rehabilitation outcome of bilateral amputee patients.
Methods: A retrospective quantitative study was conducted. Data were collected from medical documentation of all bilateral amputee inpatients that were on rehabilitation in our Rehabilitation Institute from January 2006 to December 2015.They were assessed using the motor sub-score of the Functional Independence Measure (mFIM) at admission and at discharge from rehabilitation Institute.
Results: Statistically significant progress in motor FIM from admission to discharge from Rehabilitation Institute was found in bilateral transtibial amputees, because we fit them with both transtibial prostheses and they were able to walk with the prostheses with the aid of both crutches or with walker. Also in one side transtibial , and on another side transfemoral amputees there was statistically significant progress in motor FIM, mostly we fit them with transtibial prostheses and enable them the transfer from bed to wheelchair, and if they are in good physical condition, we fit them also with transfemoral prostheses, so they are able to walk with crutches or with walker. Bilateral transfemoral amputees mostly use wheelchair for ambulation (especially if the reason for amputation is peripheral arterial vascular disease), the progress in motor FIM from admission to discharge from Rehabilitation Institute was not statistically significant.
Conclusions: In general, the results of our study suggest that bilateral amputees during rehabilitation program improve their ambulation and selfcare ability , the most bilateral transtibial amputees, because we fit them with bilateral transtibial prostheses and they are able to walk with them with both crutches or with walker. Most of bilateral transfemoral amputees are using wheelchair for ambulation (especially if amputations were done because of peripheral arterial vascular disease), because walking with both transfemoral prostheses require too much physical effort.

OP121
TWO METHODS OF MEASURING NON NEUROPATHIC PAIN IN PATIENTS WITH KNEE OSTEOARTHRITIS

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Introduction: Western Ontario and McMaster University Osteoarthritis pain scale (WOMC) and visual analogue scale (VAS) are two methods of measuring pain intensity. The aim of study was to investigate the relationship between these two methods in assessment of knee pain intensity in knee osteoarthritis.
Material and method: 100 Patients were studied according to inclusion criteria among patients with knee osteoarthritis presented to Mobility Impairment Research Center, north of Iran. Diagnosis of knee osteoarthritis was confirmed according to the American College of Rheumatology criteria based on clinical and radiological findings. Inclusion criteria consisted of all patients aged ≥40 years that had knee pain for at least one month or longer. The intensity of knee pain was determined by visual analogue scale and WOMC pain scale. The relationship between two variables was determined using Pearson test and linear regression analysis.
Results: 100 patients completed the study with median age 50±6.65 years, height 163±6.64 cm and weight 74±12.72 kg. The mean of visual analogue scale was 37.08±6.61 mm and Western Ontario and McMaster University Osteoarthritis pain scale pain scale was 9±1.8. Pearson correlation between visual analogue scale and WOMC pain scale was .210 and had not significant correlation (p=.89).
Conclusions: These studies indicate that there aren't relationships between VAS and WOMC pain scale in assessment of pain intensity in patients with knee osteoarthritis. Therefore, we recommend that either of two methods must be used individually to measure pain intensity.

OP122
THERAPEUTIC EFFECTS OF TRADITIONAL THAI MASSAGE ON PAIN, ANXIETY AND CERVICAL RANGE OF MOTION IN PATIENTS WITH UPPER TRAPEZIUS MYOFASCIAL TRIGGER POINTS: AN ASSESSOR-BLIND RANDOMIZED CONTROLLED TRIAL.

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Introduction: Myofascial pain syndrome (MPS) is one of the most common and painful conditions in chronic musculoskeletal syndrome which affects the muscle and its surrounding fascia. Although traditional Thai massage (TTM) has frequently been used as an alternative treatment for MPS, there is not enough evidence to support the effects of TTM on these patients.
Purpose: To clarify the effect of TTM on pain, anxiety and cervical flexion in patients with upper trapezius myofascial trigger points.
Method: Fifty patients were randomly assigned to receive a 30-minute session of either TTM (a form of deep massage with brief sustained pressure on the muscles along with passive stretching) or sham microwave diathermy (sham MWD) for 9 sessions over a period of 3 weeks. Thai Short-form McGill Pain Questionnaire (Th-SFMPQ), State Anxiety Inventory (STAI) and cervical flexion were measured before and 1 day after the treatment period.
Results: TTM group showed a significant improvement in all parameters after 3 weeks of the treatments whereas, the sham MWD group showed a significant improvement only in the Th-SFMPQ and STAI ($p<0.05$) (paired t-test). Moreover, the TTM group demonstrated more improvement than the sham MWD group in Th-SFMPQ, STAI and cervical flexion at the end of the treatments ($p<0.05$) (ANCOVA).
Discussion and conclusions: The mechanisms by which TTM may improve the pain and anxiety may be explained by gate control theory and the theory of relaxation response. In addition, local pressure by TTM may elongate the contraction knot sarcomeres by stretching the affected muscle fiber, consequently increasing the blood flow to the area and releasing the myofascial trigger point which lead to reducing the pain and increasing the range of motion. In conclusion, TTM appears to be a useful method of reducing pain and anxiety and increasing cervical flexion in this patient population.

OP123
POST-SURGICAL DUPUYTREN'S DISEASE REHABILITATION IN FERNANDO FONSECA'S HOSPITAL EPE – A RETROSPECTIVE STUDY

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Introduction: Dupuytren's disease is proliferative connective tissue disorder that involves the hand's palmar fascia. The first clinical signs reported by the patient are skin pitting and thickening near the MCP. The ring and small fingers are the most affected. Dupuytren's disease is more common in patients older than 40 years and in men. Diabetes mellitus, alcohol use, smoking and HIV have all been associated with a higher (risk) of Dupuytren's disease development. Surgical intervention is the gold standard for Dupuytren's treatment and is indicated in cases of advanced disease. Postoperative rehabilitation should start between 3 and 5 days with early ROM and palmar shift.
Purpose: Characterize the post-operative population with Dupuytren's disease and evaluate gains with the intervention of rehabilitation.
Method: Retrospective and descriptive longitudinal study from the archives of clinical assessments of surgically treated Dupuytren's disease evaluated and treated according with a protocol of the department of occupational therapy at our department.
Results: From a total of 42 Dupuytren's disease treated between January 2014 and August 2015, 39 (93%) were men. The average of age was 63.5 years. Risk factors association was predominantly diabetes mellitus type 2 (23.8%), smoking (4.7%) and moderate alcoholic habits (4.7%). 35 (83%) patients were intervened in the right hand, and the majority of the patients were intervened in the 4th and 5th finger. 38 patients (88%) attended the sessions twice a week. 5 patients abandoned the treatment before the end. 4 (9.5%) patients had in the medical revaluation alterations in scar sensibility. The daily living activities most affected at the beginning of the treatment were washing the face, cutting food and picking up objects. The gains of the angles in extension were 7º for the MCP, 5º for the IFP, 0.7º for the IFD. In the flexion, the gains were 6.7º for the MCP, 7.6º for the IFP, 7.5ºfor IFD.
Discussion and conclusions: The analyzed population is in accordance with the literature. Systematized rehabilitation in a hand specialized department is very important for the gain of mobility, force and quality of the movement, after surgery.

OP124
GOOD PROGNOSIS FACTORS AFTER A PLATELET RICH PLASMA (PRP) INJECTION FOR TENDINOPATHIES?

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Introduction: Platelet-rich plasma injections are a recent treatment for chronic tendinopathies. However, this theraeutic remains controversed in litterature. Up to now, there is no prognosis factors identified to predict a good evolution after injection of PRP.
Purpose: The aims of this study were to evaluate the effect of PRP injection followed by a standardized reeducation protocol among patients suffering from different tendinopathies and to determine the good prognosis factors, if any.
Methods: 51 patients suffering from different tendinopathies and refractory to conventional physiotherapy were treated with a PRP injection. Prior to the injection, a blood sample was drawn and some biological parameters (glycemia, cholesterol level, …). A pain assessment was then made using a visual analog scale (VAS) and a pressure algometer. The same assessment was carried out after 6 weeks and 12 weeks when possible.
Results: There is an overall significant improvement VAS score at the end of the 12 weeks follow- up. However, no correlation was found between the evolution of the clinical scores and the biological parameters measured.
Discussion and conclusions: A PRP injection followed by a program of eccentric rehabilitation positively affects the algo-functional scores of patients with tendinopathie who were refractory to conventional physiotherapy, whatever their initial biological parameters.

OP125
3D_TESTING OF SPINAL STABILIZER MUSCLES

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Introduction: We want to show that achieved test results enable to detect muscular imbalance even at subclinical level and to elaborate individual rehabilitation programs.
Purpose: To prove that the peak torque is the most informative indicator for dynamic force assessment, other indicators are very variable and do not have significant clinical value.
Method: BioniX sim3D Pro allows implementing of both dynamic and static force assessment in three dimensions in sitting and standing position with the possibility of isokinetic testing. We have conducted 89 tests of subjects aged between 16 and 65 years with BioniX Sim3 Pro system. The subjects have medical history of lower back pain of different intensity and duration. At the moment of the examination no one complained about pain at rest. X-ray examination data has not indicated any destructive changes in spine structures.
Results: Isokinetic tests of movement around three axes were executed within predefined range of movement. Several variants of test were performed i.e. with angular speed of 90, 45, 30 and 15° per second. As the result of tests a report with graphs, mathematic analysis results and comparison of agonists and antagonists was generated. Graphical data about motion in each direction and average force data around other axes were presented in the report separately.Absolute values of both static and dynamic force in isometric and isokinetic tests (peak torque) varied in a wide range and were highly individual.
Discussion and conclusions: 1. Functional assessment of spine stabilizing muscles can be performed with the help of BioniX Sim3 Pro 3D technology, allowing both isometric and isokinetic tests. 2. The results of isometric and isokinetic spine stabilizing muscle tests help to reveal not only severe pathology and certain muscular insufficiency, but also detect subclinical muscular imbalances, which is the base for individual rehabilitation program development.

OP126
NEUROMUSCULAR AND KINEMATIC PATTERN DURING TRUNK FLEXION-EXTENSION IN HEALTHY SUBJECTS AND CHRONIC LOW BACK PAIN PATIENTS

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Introduction: The root mean square surface electromyographic (RMS SEMG) activity of lumbar extensor muscles and the related lumbar spine kinematics during dynamic trunk flexion-extension have proven to objectively differentiate normal persons from chronic low back pain (cLBP) patients. Patients and older persons had difficulty to comply with standardized trunk movement velocity which significantly affected the electromyographic measurement results. However, literature on isometric testing is sparse.
Purpose: This study sought to examine differences between cLBP patients and healthy volunteers in a standardized isometric trunk flexion-extension task.
Methods: 190 patients between 18 and 90 years old (47,97 ± 17,51 years) and 71 healthy matched volunteers (48,5 ± 19.95 years) performed testing by holding static positions at standing, half, and full trunk flexion. The lumbar extensor muscle activity and the lumbar spine ranges of motion were recorded and calculated from 3d-accelerometers. Generalized linear mixed effect models were performed to examine for differences in the RMS SEMG activity at the standing position, the half flexion relaxation ratio [RMS SEMG activity at the half divided by the maximum flexion position (HFR)], the repositioning error (error of L5 position at standing between 2 test repetitions), the lumbar spine range of motion, and the fear avoidance behaviour.
Results: Measurements revealed higher lumbar extensor muscle activity at the standing position in patients. However, the repositioning error was lower and the lumbar spine range of motion was higher in the patients compared to the healthy volunteers whereas there was no difference between the groups in the HFR and the fear avoidance behaviour.
Discussion and conclusions: Patients and healthy volunteers have shown unimpaired and impaired neuromuscular regulation of back extensors performing isometric trunk flexion extension testing. Future studies should focus on defining subgroups of populations potentially allowing the design of prevention and treatment programs addressing individual deficits.

OP127
NEW METHODS OF TREATMENT OF PATIENTS WITH VERTEBROGENIC CERVICOBRACHIALGIA

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Introduction: At present 35.7% of all patients seeking help for spinal disorders are patients with cervicobrachialgia.
Purpose: To assess the impact of modern methods of treatment on sensitive disorders in cervicobrachialgia.
Method: We examined 100 patients, 56 men, 44 women, mean age 46.5 ± 5. 43 patients MRI revealed disk herniation has at C5-C6, 57 patients at the level C6-C7. In addition electroneuromyography was used as investigative technique. Based on the results of electroneuromyography, 20 patients showed reduced amplitude of the M-response in the muscles innervated by the affected spine, among 10 patients the absence of F-wave amplitude at a normal M-response in the corresponding muscle. All patients were divided into 2 groups, 50 person each, and all had preliminary accepted medicamentous therapy. First group of patients received procedures of physiotherapy. The second group -physioterapy and homotoxicological pharmacopuncture, shockwave therapy, traction of cervical department of a backbone, interstitial electrostimulation.
Results: In the first group there was a positive dynamics in the form of a reduction of pain, musculo-tonic syndromes at the cervical level, static-dynamic disorders. However, there remains a sense of paresthesias in the hands. In the second group of patients showed a significant improvement: in 12 patients symptoms completely regressed, 5 patients remained small sensory disorders.
Discussion and conclusions: Currently available methods of treatment assist the prompt improvement of sensitive frustration at patients with cervicobrachialgia.

OP128
COMPARISON OF LOW LEVEL LASER THERAPY AND TENS IN THE TREATMENT OF TEMPOROMANDIBULAR JOINT DISORDERS FOLLOWING THE USE OF UNSUITABLE PARTIAL DENTURES

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Introduction: Temporomandibular joint disorders (TMDs) are identified as complications caused by unsuitable partial dentures and as a result of irregular occlusion, articulation and vertical/horizontal dimension faults.
Objective: The purpose of our prospective study was to assess the effects of low level laser therapy (LLLT) and TENS in the treatment of TMDs.
Materials and methods: A prospective comparative study with a 3-month follow-up period was completed between April 2013 and October 2015. Sixty-six patients with TMDs (mean age of 59 years +/- 14 years) were randomly assigned to an cumulated intervention LLLT and active exercise and manual therapy group A (N=22), TENS and active exercise and manual therapy group B (N=22) and control group C with only active exercise and manual therapy (N=22). The LLLT and TENS groups were treated with fifteen sessions (6 weeks) together with active exercise and manual therapy. Following main outcome measures were evaluated: (1) Pain at Rest (2) Pain at Stress (3) Maximum Vertical Opening and (4) Muscular Palpation. Evaluation was conducted immediately before and 5 minutes after each session, and at 3 month follow-up.
Results: Significant reduction of pain at rest and stress was observed in all three groups, meanwhile in the LLLT 86.4% (19/22) and TENS 81.8% (18/22) groups have achieved 85% of improvement from baseline regarding Maximum Vertical Opening at 3 months follow-up compared with 59.1% (13/22) at the control group. Outcomes regarding Muscular Palpation parameters demonstrated significant improvements at the LLLT group compared to TENS and control group ($p<0.05$).
Conclusions: LLLT and TENS therapy combined with active exercise and manual therapy was more effective than only exercise and manual therapy for the treatment of temporomandibular joint disorders related to unsuitable partial dentures.

OP129
COMBINED OSTEOPATHIC AND ORTHODONTIC TREATMENT IN FACIAL PAIN PATIENTS ASSOCIATED WITH TEMPOROMANDIBULAR JOINT DISORDERS

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Introduction. According to WHO data 40 % of people from 20 to 50 years old have temporomandibular joint disorder (TMJ). Etiological factors provoking development of given pathology is malocclusion, teeth extraction, whiplash injury, bruxism. It's necessary to take into account all significant factors to play a part in facial pain generation in patient with TMJ disorders. Therefore, multidisciplinary medical assistance for successful treatment needed.
Purpose. Compare the multidisciplinary treatment of facial pain patients associated with TMJ disorders to orthodontic or osteopathy treatment alone.
Material and methods. This study includes patients with TMJ disorders confirms clinical data. All patients divided in three groups: first group in number 8 patients had osteopathic treatment (1 procedure twice in a week during two weeks); second group in number 7 patients had orthodontic therapy by individual occlusal splint during two weeks; third group in number 8 patients had both osteopathic and orthodontic treatment also in two weeks. Superficial electromyography and stabilometry made before and after treatment. Activity of masticatory muscles measured in both side in resting state and maximal clutch. Assessment of postural state made in european stand with opened and closed eyes, resting jaw muscles and maximal clutch.
Results. Positive changes exists in all three groups. Although, in second and third groups stabilometry data significantly changed in comparison to first group. It means more centered position of total pressure center, less square and length of statokinesiogram ($p<0,05$). In first and third groups total activity jaw muscles in left and right sides after treatment was similar (45,7% to 54,3% and 48,4% to 51,6% accordingly). In second group muscles activity before and after treatment was not difference.
Conclusions. Interdisciplinary treatment in patients with facial pain associated with TMJ disorders more preferably than osteopathic or orthodontic treatment alone.

OP130
MOTOR SYNERGY IN PEOPLE WITH NEUROLOGICAL DISORDERS: APPLICATIONS FOR GAIT REHABILITATION

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Introduction: A functional feature of human movement control is the ability to achieve a skill in different ways. High or low stride-to-stride variability is a sign of motor imbalance that could enhance risk of falling. According to the principle of motor abundance, if observed variability restricts functional gait, then increased variability may have a detrimental effect on performance. In contrast, if increased variability facilitates task function, then it can be assumed that it is beneficial for gait regulation.
Purpose: 1) To compare motor synergies variability of people with and without neurological disorders when walking on a treadmill. 2) To compare swing phases of motor synergies during preferred-stride and long-stride walking.
Method: Ten people with hemiparetic stroke and brain injuries (male=7, female=3, M=63.88 years, SD=10.39) and ten participants without these injuries (male=7, female=3, M=72.66 years, SD=8.10) were selected voluntarily, from a Neurological Rehabilitation Centre. Two-dimensional motion analysis was used to measure horizontal angles in thigh and shank segments when they walked on a treadmill at their preferred comfortable speed. The Uncontrolled Manifold methodology was used for quantification of motor synergies.
Results: There were no differences between participants with and without neurological disorders during preferred walking conditions, whereas individuals with neurological disorders (1.56± 0.15) displayed significantly higher synergy levels ($F=4.48$, $p<0.05$) relative to people without disorders (1.12± 0.13) in long-striding conditions. Additionally, in both preferred and long-stride conditions the initial-swing phase (1.51±0.25) displayed significantly higher synergy levels ($F=3.75$, $p<0.05$) than mid-swing (1.03±0.15) and terminal-swing (1.07±0.16) phases.
Discussions: Motor synergies play an important role in control of stride variability in the swing phase of gait, although people with neurological disorders tend to display weaker synergies in this task.
Conclusions: These findings imply that the purpose of gait re-education could be to improve the motor synergy between limb components and help patients to functionally utilise available system degrees of freedom.

OP131
REHABBOX – DEVELOPING AND VALIDATING A KINECT BASED SYSTEM FOR GAIT ANALYSIS

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Introduction: Gait analysis provides invaluable parameters for gait rehabilitation. However, existing systems like GaitRite and Vicon are costly, require specialized training/software and time consuming; limiting their wide adaptation.
Purpose: To address these issues we developed a portable, cost-effective, user-friendly gait analysis system (RehabBox) using Kinect® to study gait cycle with adequate accuracy. In this study our system was validated with GaitRite using two gait variables – stride-length (distance between successive points of initial contact of same foot; i.e. left to left or right to right) and stride-time (time elapsed between the first contacts of two consecutive footfalls of the same foot).
Methods: Temporal variation of 'X'-co-ordinate of skeleton-data (parallel to Kinect) of left and right ankles were used for stride-length and time estimation. We developed an Eigen vector based novel algorithm to detect heel-strike and toe-off from the point of inflection (POI) in the temporal variation of skeleton-data. The distance and time difference between two consecutive POIs were considered as stride-length and time respectively.
Results: 4 healthy subjects (age 25-35, 2 male and 2 female) underwent 90 trials with 2 Kinects covering the GaitRite length (approx. 18ft). Stride-length and time computed from Kinect had mean-absolute-deviation of 3.08cm and 800ms respectively, from GaitRite measurements. Bland-Altman plot was used to find the confidence interval for Kinect based parameters with relation to GaitRite and Kinect-based parameters were found to be highly reliable (all ICCs > 0.91).
Conclusions: Kinect based gait analysis using our novel algorithm was found to be highly reliable as compared to GaitRite, one of the gold standards of Gait analysis. However, noise due to occlusion effect and IR-interference are two practical limitations. To create an affordable, easy-to-use gait analysis tool, our results need to be validated a large clinical trial.

OP132
THE INFLUENCE OF HEELS HEIGHT INCREASE IN MALE INTO ERECTOR SPINAE MUSCLE ACTIVITY WHILE WALKING

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Background: Heel height enhancement has been considerably related to lower back pain. The enhancement of heel height has been proven to change the way we walk by placing the feet in the plantar flexion position and enhancing ground reaction force (GRF), which is then transmitted to the backbone area. This force is considered as one of the predisposing factor that leads to lower back pain. The use of high heels nowadays is not only exclusively found in females; there are many companies that produce specific heels for males. However, the influence of these heels on men's erector spinal muscle activity has never been studied before.
Method: This was a pre-experimental study with a cross sectional approach. This study was done in the Gait Analysis Laboratory of Department of Medical Rehabilitation of Dr. Soetomo Hospital Surabaya. The study involved 18 to 35-year-old males living in Surabaya who had fulfilled the inclusion criteria. The subject of study was asked to walk subsequently without any footwear, with 3 cm heels, and with 5 cm high heels. EMG surface was used during the walk to assess the erector spinal muscle activity.
Result: We enrolled a healthy sample of 15 males who already fulfilled the inclusion criteria. The difference of erector spinal muscle activity between those who walked barefoot compared to those with 3 cm high heels was 5,52%. The difference of contraction value while walking barefoot compared to those with 5 cm high heels was 7,42%. The difference of muscle contraction between those who walked with 3 cm compared to those with 5 cm high heels was 14,826%. Analysis using a paired t-test showed a significant difference between erector spinal muscle contraction while walking with 3 cm high heels compared to barefoot ($p = 0,046$) and while walking with 5 cm compared to those with 3 cm high heels ($p = 0,031$). There was no significant difference in muscle contraction while walking barefoot or with 5 cm high heels ($p = 0,204$).
Conclusions: These data showed difference between erector spinal muscle activity in males who walked barefoot and those who walked with 3 cm high heels, and between those who walked barefoot and those with 5 cm high heels. However, there was no difference in erector spinal muscle activity when walked with 3 cm compared to those with 5 cm high heels.

OP133
GAIT ASSESSMENT AFTER ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION – A NEW EVALUATION MODEL

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Introduction: Anterior cruciate ligament (ACL) injury predisposes to early-onset secondary knee osteoarthritis. Gait assessment after ACL reconstruction may allow a better understanding of the functional prognosis and planning of preventive strategies.
Purpose; The aim of this study was to test a computational model for gait analysis in clinical practice to detect gait stability (GS), gait errors (GE) and symmetry index (SI), and calculate the severity of the gait disorder in reconstructed ACL patients.
Method: 2 to 5 years reconstructed ACL patients were engaged from an outpatient consultation of Physical and Rehabilitation Medicine Department. Lisholm and Tegner knee scales were applied and vertical ground reaction forces (VGRF) were collected from all patients walking at 5 different speeds, using instrumented shoes. Specific normal gait pattern was generated for each subject according to individual characteristics, using a computational intelligence method. Symmetry index (SI) and gait error (GE) were calculated based on VGRF. A healthy region (HR) was identified for comparison purposes. A healthy gait (HGI) and an unhealthy gait indexes (UGI) were calculated using the graph points that were respectively inside and outside the HR.
Results: 8 patients (7 male), with a mean age of 31 years, were included. Lisholm Knee Scale mean score was 81.25±4.46 and Tegner Knee Scale mean score was 8.5±0.93. 4 patients showed healthy gait patterns and the other 4 showed an unhealthy gait, at the shortest and the longest stride durations. GE was generally larger for the healthy limb. Patients injured on the dominant side recovered the dominant limb function.
Discussion and conclusions: These indexes quantify gait deviations and consider symmetry, enabling to determine which limb and stride durations are less recovered and hence correctly adapt the rehabilitation program to each patient. This methodology can potentially be used to assess osteoarthritis risk in ACL reconstructed patients.

OP134
COMPUTATIONAL INTELLIGENCE INDIVIDUAL REFERENCES FOR GAIT ANALYSIS

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Introduction: The mechanisms that underlie the human locomotion are complex and the nature of the disorders affecting gait is variable and of challenging diagnosis. Gait analysis might be more accurate if we compare the patient's gait pattern with a healthy gait pattern reference estimated according to his individual characteristics, instead of a generic one.
Purpose: The aim of this research project was to determine the use of computational intelligence methods to generate reference vertical ground reaction forces (VGRF) based on subject's, age, weight, height and stride duration, considering these are all characteristics that affect the gait pattern, and test 3 Computational Intelligence Techniques (CIT) for gait analysis: Artificial Neural Network (ANN), Extreme Learning Machine (ELM) and Multi-output Support Vector Regression (MSVR).
Method: VGRF data was collected from 28 healthy males walking at 5 different speeds using instrumented shoes. Individual characteristics such as age, weight, height and stride duration of each subject were used to build a complete database. This data was used to train 3 different computational intelligent methods (ANN, ELM and MSVR) that generate a specific VGRF reference pattern for input subject's characteristics.
Results: All CIT generated VGRF references specific to each subject, with generation times of less than one second and gait profiles according to expected considering different inputs. The ELM algorithm showed the lowest root mean square error for the test set.
Discussion and conclusions: This study shows the potential use of computational intelligence methods to generate VGRF references according to each subject's age, weight, height and stride duration. According to our results, trained models can be integrated in software for real time gait analysis, providing specific VGRF references that can replace the standard mean patterns of a generic population.

OP135
INVESTIGATING THE NORM VALUES OF GAIT VARIABILITY AND RELATIONSHIP BETWEEN STEP LENGTH IN HEALTHY YOUNGS: A PILOT STUDY.

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Introduction: Previous studies showed that gait variability is an important factor for balance and gait related functions. Bu there was no study which investigates relationship between gait variability and step length in healthy youngs and norms of gait variability in healthy youngs.
Purpose: Investigating the norm values of gait variability and relationship between step length in healthy youngs.
Method: A hundred twenty one healthy youngs (38=male, 83=female), age between from 20 to 27 years, were the participants of the study. Gait variability and step length were evaluated with Gait Trainer Biodex 2, at participant's preferred speed for two minutes.
Results: Right step length was 69,66±7,31, left step length was 65,66±8,04, right step length variability 13,61±6,94%, left step length variability was 26,97±11,65% There were negative correlation between step length variability and step length ($p<.05$)
Discussion: The study showed that the norm values of gait variability in healthy youngs and stabile gait required long step length.
Conclusions: The study may provide predictive opinions in treatment individuals with gait problems. It is recommended that increasing the number of participants to generalize these results

OP136
MUSCULAR AND FUNCTIONAL TRIDIMENSIONAL ANALYSIS AFTER HAMSTRING STRAIN

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Introduction: The muscle injury, more especially the hamstring strain, account for a large proportion of explosive top athletes injuries. Despite rehabilitation, hamstring reinjury rates are still high (26% of all injuries) [1]. A more functional test could help the clinician in the return to play process decision to reduce the muscle injuries hamstring relapse.
Purpose: The aim of our methodology is to analyze, after medical clearance to resume sports, for athletes who suffered from grade II/III hamstring muscle strain, the biomechanics of the lower limbs during an explosive jump task.
Method: After (7,3±0,7weeks) a grade II/III hamstring muscle tear, eight men (25±5,9years), without past lower limb major injury, performed: - an isokinetic test (knee flexion-extension in concentric at 60degrees/s and 240degrees/s, flexion in eccentric at 30degrees/s); - a tridimensional biomechanics analysis of (bipodal and unipodal) squat jump and counter movement jump with Codamotion® system and Kistler® multicomponent force plates.
Results: A muscular lateral strength imbalance has been identified on the hamstring in concentric and eccentric (13% with p-value (Wilcoxon)=0,0156) by means of isokinetic testing. The main statistical significant outcome in the biomechanics analysis is the lower knee angle (11% with p-value (Wilcoxon)=0,0234) at the low point before the pushing phase of the unipodal CMJ for the healthy leg than to the other one whereas there's no difference between both legs in an equivalent healthy population.
Discussion and conclusions: The tridimensional analysis appears to be complementary, not redundant, with the isokinetic strength testing due to the different nature of their informations obtained. It could be integrated in the return to play process decision expected the potentially interesting information about the player's biomechanics that it provides.

OP137
KNEE AND ANKLE FLEXION ANGLES DURING SIT-TO-STAND MOVEMENT

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Introduction: Knowledge about biomechanics strategies during sit-to-stand movement in the general population and its determining factors may facilitate the physiotherapist intervention in the functional rehabilitation of this movement.
Objective: The present study aims to characterize knee and ankle flexion angles during sit-to-stand movement and to compare those angles between foot arch categories.
Methodology: It was performed a cross-sectional study with a sample of 78 subjects. Foot arch was assessed in the right lower limb using a pedigraph. Chippaux-Smirak Index was calculated and classified as pes cavus, pes planus, normal arch, intermediate arch and longitudinal arch. The sit-to-stand movement was recorded on video. All participants began the task seated and performed the standing movement in their natural position and velocity. Each participant performed three trials with one-minute break. The video was frozen in the beginning of the stand task. Knee and Ankle flexion angles was analysed through Postural Analysis Software - SAPO. We compared knee and ankle flexion angles between foot arch categories using One-way ANOVA test.
Results: During sit-to-stand movement, the average of knee and ankle flexion angle was 90,1º (standard deviation: 6,75º) and 86,3º (standard deviation: 5,33º), respectively. No statistically significant differences between foot arch categories were found for knee flexion angle (p=0,774) and ankle flexion angle (p=0,614).
Conclusions: The knee and ankle flexion angle during sit-to-stand movement was characterized. It was also established that foot arch is not a decisive factor in sit-to-stand rehabilitation.

OP138
MUSCULAR ACTIVATION OF LOWER LIMBS DURING REHABILITATION WITH AN INNOVATIVE SYSTEM BASED ON INERTIAL SENSOR AND BIOFEEDBACK

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Introduction: Several rehabilitation systems based on inertial motion units and bio-feedbacks are increasingly used in different rehabilitations settings [1]claiming a better controlled and correct rehabilitation motion tasks execution and therefore a better outcome.
Purpose: The objective of this study was to compare muscular activation pattern of lower limb key muscles during different rehabilitation tasks performed with a validated system based on IMU and biofeedbacks[2] and with traditional rehabilitation.
Method: 12 healthy subjects were included in this study and evaluated in a rehabilitation center. Muscular activation pattern of gluteus maximum, gluteus medium, rectus femoris and biceps femoris was recorded through surface EMG (EMG WAVE, Cometa; Milan) during 6 different motion tasks . Subjects were assessed performing 10 repetitions of each motion tasks for a total of 100 repetitions per motion tasks with and without Riablo System. A single threshold algorithm was used to identify activation timing of investigated muscles[3].
Results: During hip abduction in standing position, gluteus maximum and rectus femoris showed a better and longer activation pattern while using Riablo. Gluteus medium showed a similar activation pattern while biceps femoris showed no activation from 30%to 80% of motion task using Riablo. During lateral lunge gluteus maximum, gluteus medium and rectus femoris were active in all repetitions and for the entire motion task while using Riablo.
Discussion and conclusions: The use a rehabilitation system based on inertial motion units and biofeedback seems to allow a more selective and effective muscular activation of selected muscles due to the more correct and controlled execution of rehabilitation motion tasks and to the absence of compensations.

OP139
EUROPEAN PROJECT CLOUD-SME: INTEGRATED CLINICAL AND FUNCTIONAL ANALYSIS OF AN INNOVATIVE 3D LASER SCANNING SYSTEM FOR THE PRESCRIPTION AND EVALUATION OF CUSTOMIZED INSOLES FOR WORKERS WITH OVERLOAD FOOT PATHOLOGIES

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Introduction: In Italy work-related injuries are 700.000/year, 15% regarding ankle-foot district. The use of safety shoes is required even if leading to discomfort and lower limb overuse pathologies The use of a customized insole can guarantee a better comfort and plantar pressure distribution. The purpose of this study was to prescribe and evaluate personalized insoles for workers with lower limb overload pathologies trough an integrated clinical and functional evaluation supported by an innovative 3D laser scanning system.
Methods: 15 metalworkers with overload pathologies were included in this study. Worker's foot was scanned trough a 3D laser scanning system and Data were sent trough Cloud System to insoles producers.When customized insoles were ready, workers were recalled to IOR Laboratory of Movement Analysis. They were assessed with the Manchester Oxford Foot Questionnaire (MOxFQ) and a comfort questionnaire. For the baropodometric evaluation through the Pedar Insole System (Novel) workers were asked to perform different motion tasks such as normal speed walking, stairs ascending, load lifting etc. wearing safety shoes with and without the personalized insole
Results: The mean score at the MOxFQ was 28,1 ±11,9. Baropodometric analysis showed a mean peak pressure during gait of 279 KPa using personalized insole and 311 KPa without , mean pressure was 145 KPA with insole and 155 without , Pressure-time integral was 126 KPa with insole, and 127 KPa without them. The mean score at the comfort scale was 7.6 with insole and 8.3 without them.
Conclusions: The use of customized insoles can provide a better plantar pressure distribution with lower peak pressure and therefore a lower incidence of overload pathologies. Further investigation is needed in order to assess long term results and benefits.

OP140
DIGITAL VERSUS CLASSIC GONIOMETRY IN SHOULDER MOTION EVALUATION

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Introduction: Shoulder range of motion evaluation is not only of diagnostic significance but is also relevant for monitoring therapeutic success. The digital goniometer is a new means of achieving this goal but its reliability when compared to the classic goniometer remains to be established.
Purpose: To ascertain the intra-rater reliability between manual and digital goniometry (through a smartphone app – getmyrom 1.03) in shoulder motion evaluation of two classic positions, standing (St) and supine (Su), measuring active flexion (AF) and external rotation (ER).
Method: 16 healthy volunteers were selected. Measures were taken by two independent raters at two different times, a week apart. Order of participants and measurement sequence was randomized. Both raters were blinded to the results of intermediate measurements, which were subsequently analyzed by a third independent researcher. Raters were trained according to a predetermined measurement protocol. The intra and the inter-rater reliability was quantified using the intraclass correlation coefficient (ICC). Limits of agreement were established in accordance with the Bland and Altman method.
Results: The intra-rater correlation was good regarding the ER St_{ICC} 0,92 (IC 95%: 0,78-0,98), the ER Su_{ICC} 0,91 (IC 95%: 0,75-0,86)) and the AF St_{ICC} 0,92 (IC 95%: 0,78-0,97). The score was lower in the AF Su_{ICC} 0,77 (IC 95%: 0,41-0,92).
Discussion and conclusions: There was a good intra-rater reliability between classic and digital goniometer in ER (regardless of positioning) and in standing AF. Digital goniometer might be an easy tool to assist physical examination in healthy individuals, but accuracy and applicability to clinical settings still need further evaluation.

OP141
INTRA-ARTICULAR VISCOSUPPLEMENTATION IN KNEE OSTEOARTHRITIS: A 13 YEAR-LONG RETROSPECTIVE STUDY OF A PHYSICAL AND REHABILITATION DEPARTMENT.

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Introduction: Knee osteoarthritis is the most frequent articular pathology and is associated with high morbidity. The intra-articular viscosuplementation is one of the most used therapeutics in osteoarthritis refractary to conventional therapy. The goals of this study are to evaluate the results of osteoarthritis treatment with intra-articular viscosuplementation and compare the results between the three most frequently used devices.
Methods: The clinical viscosuplementation files of 13 years were analysed, between 07/01/2000 and 01/09/2013. The inclusion criteria were patients with knee osteoarthritis with three sequential administrations of the same Hyaluronic device, separated in time no more than 30 days among them. The exclusion criteria was any other concomitant treatment to knee osteoarthritis. The studied Hyalart® group had 176 patients, the Structovial® group had 117 patients and the Orthovisc group had 44® patients, with a total number of studied patients of 337 patients. The analyzed classifications were based in the padronized answer to the same question made in the beginning of each medical appointment: "How is your pain since the beginning of the treatment?", with five possible answers in a Likert-like scale: 1-worse; 2-no improvement; 3- slight improvement; 4- moderate improvement; 5- high improvement.
Results: In the end of the three injections, there was a similar proportion of patients referring an "high improvement": 19% with Hyalart® and Structovial® and 12% with Orthovisc®. The first treatment was not efficient (worse or no improvement) in 39% of the patients with Hyalart (9% were worse), 17% of the patients with Structovial® (7% were worse) and 75% of the patients with Orthovisc (28% were worse).
Conclusions: The intra-articular viscosupplementation is a safe and efficient treatment in the treatment of the pain caused by knee osteoarthritis. The devices derived from biofermentation appear to have more favourable outcomes along the treatments.

OP142
VERTEBRAL FRACTURES IN SPONDYLARTHROPATHIES: A CHARACTERIZATION STUDY OF A GROUP OF PATIENTS ONGOING REHABILITATION

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Introduction: The bone is a target in many inflammatory rheumatic diseases. In spondylarthropathies (SpA), inflammation leads to bone remodeling, changes the spine biomechanical properties, leaving it more prone to fracture after minor trauma.
Purpose: To characterize a group of patients with SpA, ongoing rehabilitation treatment, and to estimate the prevalence of low-impact vertebral fractures (VF) in this representative sample.
Methods: Patients with diagnosed SpA, answered questionnaires, underwent physical examination and blood analysis. Vertebral fractures were identified by anteroposterior and lateral radiographs of the cervical, thoracic and lumbar spine. Data were analyzed with Excel®.
Results: Thirty two patients (69% men) with a mean age of 53 +- 11 years and the majority (75%) with a disease duration above 10 years. The sample had a mean BASMI (Bath Ankylosing Spondylitis Metrology Index) of 5.5/10, a BASFI (Bath Ankylosing Spondylitis Functional Index) of 52/100 and an ASQoL (Ankylosing spondylitis quality of life) score of 8/18. VF were diagnosed in 4 patients (13%) and none had been previously diagnosed. These patients had a mean age of 55 years and a disease duration of 27 +- 12 years. They had a mean ASDAS (Ankylosing Spondylitis Disease Activity Score) of 2.65, BASMI 7.25/10, BASFI of 60/100 and ASQoL of 11/18. Schober's test was less than 2cm in all these patients. None had neurologic complications.
Discussion: Our data is according to the latest findings in literature. Patients with VF are older, have longer disease duration, less articular motion, and worst results in metrology, disease activity, functionality and quality of life scores.
Conclusions: The physiatrist is the clinician who closely follows spondylitic patients, while in rehabilitation treatment. VF may have devastating consequences. Most of them go undiagnosed, misguided for a stronger back pain in a disease aggravation period. This study points out the role of the physiatrist on making an opportune diagnose, on treating properly and prevent unwanted sequels.

OP143
ANATOMICAL DAMAGE OF WRISTS AND BONE MINERAL DENSITY IN FEMALE PATIENTS SUFFERING FROM RHEUMATOID ARTHRITIS

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Introduction. Rheumatoid Arthritis (RA) is a systemic, autoimmune, chronic, inflammatory disease, which is, in its clinical picture, most clearly reflected on joints- jucstaarticulare and systems osteoporosis. The objective of the paper. To study the level of anatomical damage on wrists and bone mineral density in female patients suffering from RA, and then to study as to whether there is a correlation between these changes.
Materials and methods. The cross-sectional study covered 100 female patients suffering from RA, who were treated at IV and VI Departments of the Institute of Rheumatology from November 2006 to November 2007. On all the female patients, osteodensitometry was performed in the first year after the diagnosis had been made and X-ray images of wrists were also made. The level of anatomical damage on wrists was monitored and assessed applying the Larsen method. A higher value of the Larsen index indicated a poorer condition of the analyzed wrists. Thereafter, a correlation was made between the values of the T score and the values of the Larsen index.
Results. In the studied sample of female patients, the total value of the Larsen score was 40.46±18.38. By stratification of the values of the scores for the left and the right wrist, it was noticed that the value of the left wrist Larsen score was 20.11±9.27 and, of the right one, it was 20.35±9.44, without a statistically significant difference (t=-0.696, p=0.488). The total value of the Larsen index was 2.05±1.02. By stratification of the values of the scores for the left and the right wrist, it was noticed that the value of the left wrist Larsen index was 2.23±1.03 and, of the right one, it was 2.26±1.05. Bone mineral density was measured in all the female patients and, in 32 (32%), osteoporosis was established (the T-score —3.35± 1.35). From the moment of verification of osteoporosis, 3.41 ±1.80 years (from 1 to 5 years) passed on average. In this study, the level of wrist damage in female patients suffering from rheumatoid arthritis was also studied in relation to osteoporosis. This type of analysis demonstrated that there was a statistically significantly higher level of anatomical damage in the group of female patients suffering from osteoporosis as compared to the female patients without osteoporosis (÷2=11.355 p=0.045).
Conclusions. Osteoporosis was diagnosed in 32 female patients suffering from rheumatoid arthritis. The Larsen index is statistically highly significantly correlated with the values of the T score.
Larsen A. How to apply Larsen score in evaluating radiografs of rheumatoid arthritis in long term studies. J Rheumatol 1995;22:1974-75.

OP144
RECONSTRUCTION OF MUSICIANS HAND : RHEUMATOID ARTHRITIS

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Introduction: Reconstructive hand surgery has been well established for management of patient with rheumatoid arthritis, and with advent of biologic drugs disease activities including development of hand deformities are well controlled. Still there are many patients who need personalized surgery. Each patients of rheumatoid arthritis with burned out hand deformity has variety of demand for restoring hand function depending on their personal needs. We reconstructed musicians hand and successful rehabilitation read to a good result.
Method: A 61 years old woman with 35years of history of rheumatoid arthritis visited our hospital complaining of her hand deformity with unstable ulnar deviation of MP joints of II to V fingers (mutilans type) and hyperextension of IP joint of thumb. She is an amateur Erhu (two stringed bowed musical instrument) player and wanted to keep holding the bow as her hobby. To play Erhu, thumb fingertip must touch II finger to make a circle and III to V finger must keep the bow horizontal and adjust the tension of the string. We planned a surgery with thumb IP joint arthrodesis, V finger MP joint arthrodesis and transfer of d 4th dorsal interosseous muscle to and V finger. Result After two month of rehabilitation, she can hold bow between thumb and II finger and adjust string with III and IV fingers. Also she can use chopsticks and pencils with improved appearance.
Conclusions: Adequate surgery and rehabilitation will satisfy the needs of musician who is suffering from rheumatoid arthritis.

OP145
EVALUATION OF FATIGUE AND PSYCHOLOGICAL EFFECT ON CONDITION ACTIVITIES OF DAILY LIVING IN PATIENTS WITH BEHCET'S DISEASE

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Background: Behcet's disease, affecting the patient's quality of life negatively, which may result in impairment of the function of the skin and mucous membrane lesions, joint involvement and vision is a major cause of morbidity and may result in loss of eye involvement. Fatigue common in rheumatic disease, is a symptom that reduces the functionality impairing the quality of life of patients. Fatigue; availability of necessary resources to perform an activity, due to an imbalance in the use or regeneration, defined as the state of being aware of the decline in physical activity and mental capacity.
Methods: We enrolled a population of 50 adult Behcet patients. complete blood count, erythrocyte sedimentation rate, urinalysis, C-reactive protein, rheumatoid factor, antinuclear antibodies (ANA), fasting blood sugar, liver and kidney function tests were performed. Which can cause fatigue, iron deficiency anemia, vitamin D deficiency, vitamin B12 deficiency, chronic infections (hepatitis, HIV), thyroid function thyroid hormone in order to determine the disorder, iron and iron binding capacity, 25 OH-D and vitamin B12 levels, hepatitis B and C antibodies and PTH were evaluated in all patients. Multidimensional Assesment of Fatigue, Fatigue Severity Scale, Short Form- 36, Hospital anxiety depression scale is applied to all patients.
Results: MAF global index and FSS scores in the patient group compared with the control group was statistically significantly higher rate. Active joints according to the FSS values without complaint compared to non-genital ulcers in patients with more yüksekti.aktif SF-36 general health scale was significantly lower. It was determined based on the higher of the asset value of joint complaints in patients without depression..

OP146
RHEUMATOID ARTHRITIS, THE BRIDGE BETWEEN THE OUTPATIENT CONSULT OF AUTOIMMUNE DISEASES AND THE PHYSICAL MEDICINE AND REHABILITATION DEPARTMENT AT THE BRAGA HOSPITAL

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Introduction - Early diagnosis, immediate initiation of pharmacologic and physiatric treatment is essential to control the activity of rheumatoid arthritis (RA), thereby preventing disability and irreversible joint damage.
Objectives - Evaluate: the demographics of patients with rheumatoid arthritis on the Autoimmune Diseases Consult of Braga Hospital; clinical presentation of the disease; pharmacotherapy used; number of patients referred to the Physical and Medicine Rehabilitation (PMR) Department; number of patients receiving physiatric treatment; type of physiatric treatment. Make a telephone questionnaire on improving joint pain with physiatric treatment.
Methods - Query Database of the Autoimmune Diseases Consult of the Braga Hospital, from 2011 to 2014. Review of clinical journals in Glintt program in Braga Hospital. Telephone questionnaire on improving joint pain with physiatric treatment. Calculations performed in Microsoft Excel.
Results - Small sampling with 58 patients with rheumatoid arthritis in 699 patients with autoimmune pathology. Of them 75.9% were females. The presenting symptom was 100% inflammatory arthropathy. 84% of the patients had to do corticosteroid therapy and 60.4% use one immunomodulator to stabilize the disease. Only 32.7% of the patients were referred to PMR Department. Most physiatric treatments involved were hydrobalneotherapy (20%) and kinesiotherapy (32%). On the telephone questionnaire, 67% of the patients improved their joint pain with physiatric treatment.
Discussion and conclusions - It is necessary to standardize the objective evaluation of the patient, for example using the "DAS criteria". Strengthen the idea of referral of patients with RA to the PMR Department for evaluation and selection of patients to do physiatric treatment. It is needed clinical differentiation of all elements which deal with this pathology. More studies are needed, in particular the assessment of the quality of life of patients only undergoing medical treatment vs. medical treatment with physiatric treatment in Braga Hospital.

OP147
SKELETAL MUSCLE FUNCTION DEFICITS AND DYSMOBILITY SYNDROME: ARE THESE TOOLS BETTER CHARACTERIZING PATIENTS WITH FRAGILITY FRACTURES?

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Introduction: Fragility fractures have a huge impact on the healthcare management of elderly patients. These fractures are associated to impaired bone strength and functioning of skeletal muscle, and to characteristics and circumstances of falls. It is well known that muscle weakness has a pivotal role in determining falls. Recently have been proposed two new nosological entities, in order to identify functional limitation at an early stage: the dysmobility syndrome and the skeletal muscle function deficits (SMFD). These conditions are associated with an increased risk of fragility fractures. However, to the best of our knowledge, few studies investigated the association between osteoporotic fractures and dysmobility syndrome or SMFD.
Purpose: The objective of this study was to evaluate the role of previous fragility fractures as risk factor for dysmobility syndrome and/or SMFD in post-menopausal women.
Method: In this case–control study, we retrospectively examined data from the medical records of post-menopausal women aged 50 or older. We divided the study population in two groups. The first group includes women with a previous fragility fracture (cases) and the other group includes women without any previous osteoporotic fracture (controls). We identified the subjects with dysmobility syndrome, dynapenic SMFD, sarcopenic SMFD, and mixed SMFD, according to criteria proposed by Studenski et al. and Binkley et al.respectively, in both groups. Data collected refer to a 6-month period.
Results: We retrieved data of 121 post-menopausal women, 77 (63.64 %) had already sustained a fragility fracture at any site (cases). The risk for dysmobility syndrome was significantly higher (adjusted OR for age and serum 25-OH vitamin D_3 of 2.46) in the cases compared with the controls.
Discussion and conclusions: Early diagnosis of conditions limiting mobility, including dysmobility syndrome and SMFD, in patients with a history of osteoporotic fracture could be useful to identify those who have a higher risk of new fragility fractures.

OP148
ADVERSE EFFECTS OF LONG-TERM TREATMENT WITH BISPHOSPHONATES – THE CASE OF ATYPICAL FRACTURES OF FEMUR

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Introduction: Osteoporosis (OP) is a common disease, characterized by bone mass loss, alterations in trabecular micro-architecture and bone fragility, resulting in increased risk of fracture. Bisphosphonates inhibit bone reabsorption, being widely used and considered 1º line treatment in postmenopausal OP. Despite its effectiveness, prolonged use seems to be associated with bone turnover super-inhibition, and therefore an increase in bone fragility and risk of atypical femur fracture (AFF). AFF diagnose require high clinical suspicion, being recommended complementary radiologic study in patients with pain "de novo" in the middle 1/3 of the thigh. AFF could be unilateral or bilateral and radiologically is characterized by thickening of the lateral cortex (or both) and oblique fracture line.
Clinical Case: We present two clinical cases of postmenopausal women, under prolonged treatment with bisphosphonates who developed AFF.
Discussion and conclusions: The relative risk of atypical fractures is increased in patients receiving prolonged treatment with bisphosphonates, however it was found that absolute risk of fracture is low. Then, many authors argue that this risk does not contraindicate its use for long periods. Patients with AFF and significant cortical reaction should discontinue bisphosphonates and start supplementation with calcium and vitamin D. Surgical treatment is indicated for complete or incomplete fractures with significant pain. Conservative treatment should be implemented to incomplete fractures with minimal pain. There are few studies concerning adverse effects of prolonged bisphosphonate therapy in children or other special subpopulations with OP, such as spinal cord injury.

OP149
MULTIFOCAL OSTEONECROSIS IN A GUILLAIN-BARRé SYNDROME – A CASE REPORT AND LITERATURE REVIEW

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Introduction: Multifocal osteonecrosis (MON), defined by the involvement of 3 or more anatomic sites is observed in only 3 to 11% of patients diagnosed with osteonecrosis (ON).Guillain–Barré syndrome (GBS) is an acute onset, immune-mediated disorder of the peripheral nervous system. In the past ten years there have been no reports of GBS associated with MON in literature. As these patients may be exposed to corticosteroids (CS), this complication should be kept in mind.
Purpose: The authors present a case report of a 40 year old male GBS patient whose neurological symptoms started one week after a respiratory tract infection. He underwent treatment with high doses of CS for a suspected myelitis that was later discarded. Cerebrospinal fluid revealed increased protein levels. EMG supported GBS diagnosis and an intravenous immunoglobulin infusion was initiated. A year later the patient developed articular symptoms and MON diagnosis was established months after. Hips and shoulders were affected.
Method: The authors performed a literature review in Medline including case reports, case series and reviews from 2005 to October 2015. Articles enrolled had at least an abstract available in English with information on number of affected joints, age, gender and known risk factors.
Results: In the authors review, 166 patients with MON were identified, the mean age was 42.83, 55.7% were female, and the mean number of affected sites was 5.20. Hip was the most frequently affected joint. Sickle cell disease and CS were the most common associated conditions.
Discussion and conclusions: CS are established risk factors for ON. In those patients in whom ON is steroid-induced, there is evidence that the number of affected sites is related to the dose of steroids which has been given. MON is a cause of disability and should be considered in patients with persistent articular symptoms treated with CS.

OP150
A COMPARATIVE ANALYSIS OF REHABILITATION RESULTS OF PATIENTS AFTER SURGICAL AND CONSERVATIVE MANAGEMENT OF ANKLES FRACTURES WITH RUPTURE OF TIBIO-FIBULAR SYNDESMOSIS

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Introduction: Fractures of the ankles are the most common injuries of the musculoskeletal system, accounting for 20% of all bone fractures.
Purpose: Comparative analysis of time and volume of restorative treatment of patients after surgical and conservative treatment of ankles fractures with rupture of tibiofibular syndesmosis.
Method: We have analyzed the results of rehabilitation treatment of patients after surgical and conservative treatment of ankles fractures with rupture of tibiofibular syndesmosis. Subjects (n=58), divided into 2 groups: the first group - 30 patients after surgical treatment, the second group (28 patients) – after conservative treatment (plaster immobilization) of this type of injury, age 43±5. Restorative treatment was devided on 3 stages according to time after injury and consisted of exercises, PT, massage, mechanotherapy, gravitational therapy, hyperbaric oxygen therapy of a similar duration and frequency.
Results: After consecutive sessions, all patients were evaluated by Molander C. and Olerund N. scale. Statistical analysis indicated that in the first group 86.6% (n = 26) and the second only 25% (n = 7) of excellent results. At the same time in the conservative treatment of ankles fractures with rupture of tibiofibular syndesmosis only 10,7% (n = 3) the results of rehabilitation were assessed as negative.
Discussion and conclusions: Our study showed that the optimum results of rehabilitation treatment of patients with ankles fractures with rupture of tibiofibular syndesmosis were achieved in group of patients who postponed surgical treatment in combination with early rehabilitation. Our technique can reduce almost twice the period of disability and improve the quality of life of patients.

OP151
THE EFFECTIVENESS OF CONTINUOUS PASSIVE MOTION ON INTRA-ARTICULAR FRACTURES OF THE KNEE: CASE STUDIES AND REVIEW OF THE LITERATURE.

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Background: The management of intra-articular fractures (IAF) has been a long standing problem due to its complexity and poor functional outcomes. Researchers have tried to understand the ideal management for these complex fractures. The goal of treatment for these fractures is to restore joint congruity and stability which is often difficult to achieve. Articular cartilage damage and joint stiffness are the common complications of IAF. McKinley, 2010 explained that the initial impact to the cartilage and the ensuing pathomechanic and pathobiologic response of the cartilage leads to post-traumatic OA.
Purpose: Rehabilitation of these patients has an important role to play in achieving a favourable outcome. The effects of continuous passive motion (CPM) on cartilage has been well established in many animal studies (Salter,1980, Shimzu,1989). However, the effects of using CPM on humans have not been well documented in the literature.
Methods: A database search (MEDLINE, CINAHL, EMBASE AND AMED) search was conducted. Articles from Jan 2000 to May 2015 in which CPM was used as a treatment method were included in the study. Animal studies and non English articles were excluded from the review.
Results: Out of 45 articles identified in the search, 4 articles were found suitable for review.
Conclusions: The evidence around the effectiveness of CPM use on intra-articular fractures was inconclusive. Further good quality human studies are required to support its use.The focus of this presentation will be to discuss some interesting case studies and to reveal the results of our literature search.

OP152
KNEE RANGE OF MOTION AND PAIN AFTER TOTAL KNEE ARTHROPLASTY: OUR EXPERIENCE

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Introduction: Total knee joint arthroplasty (TKA) is the standard treatment for severe osthearthritis refractory to conservative treatment. The main measures of a successful TKA are increase in range of motion (ROM) and relief from pain.
Purpose: The objective of the study was to investigate how ROM and pain can be interconnected in the course of rehabilitation after TKA.
Methods: This study was a retrospective outcomes assessment on 29 patients who underwent TKA. Postoperative follow-up scheduled between 2 and 12 weeks after surgery. Patients were checked for ROM and Visual Analog Scale (VAS) was applied.
Results: Among 29 patients with a mean age of 68,9 years, 21 were female and 8 male. At 2 weeks after surgery, 79% (n=23) of the patients punctuated between 0 and 4 in VAS, 13,7% (n=4) from 5 to 8 and 6,9% (n=2) punctuated 9. ROM was limited in all patients as it was related to pain (flexion between 65 and 86º and extension between -15 and -5º). We divided our sample into two subgroups at 12 weeks assessment: Group 1) VAS 0-4; 2) VAS 5-8; 3) VAS 9-10. Group a) Flexion 100º/ Extension 0º; b) Flexion 85º/ Extension -5º; c) Flexion 80º/ Extension -5º. 12 weeks after surgery, 79% (n=23) of the patients punctuated between 0 and 4 in VAS and all patients in this group achieved 100º flexion and 0º extension, so group 1) overlapped group a). 6 patients were at group 2), 4 of this were also in group b). The other 2 patients (6,9%) developed post-surgical arthrofibrosis so they were in group c).
Discussion and conclusions: Improvements in ROM and pain relief are believed to be good criteria to access how disability and patient perceived handicap improve after TKA. In our sample we can conclude that ROM improvements are directly related to pain relief.

OP153
REHABILITATION OF PROXIMAL FEMUR FRACTURE: RESULTS OF 6 -MONTH FOLLOW-UP

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Introduction: The proximal femur fracture (PFF) is a common injury, occurring with minor trauma in the osteoporotic bone of elderly patients. Rehabilitation following PFF fracture has an important role to increase daily functional status.
Purpose: Characterize epidemiologically and functional evaluation in a 6-month follow-up of the patients with PFF hospitalized in a secondary care hospital, from June to August 2014.
Method: A prospective, longitudinal, descriptive study performed with a design using validated scales, New Mobility Scale, Visual Analogic Scale (VAS), Cumulated Ambulation Score, Timed Up and Go Test (TUG) and Mini Mental State Examination.
Results: From a total of 75 patients with PFF and submitted to surgery at our hospital, 60 (80%) were female and 15 (20%) male. The average age was 80,4 ±10,9 years at the time of their hospitalization.In this sample, 37 (49,33%) patients had femoral neck fractures, 34 (45,33%) had trochanteric fractures and only 5 (6,67%) patients had subtrochanteric fractures. Forty-six of the patients participated in the 6-month evaluation after their surgery. The mortality rate at 6 month was 20%. Most patients, 57,33%, in the postoperative period referred moderate pain according to VAS and at the 6-month evaluations the majority of the patients, 80,43%, referred no pain. Thirty-seven of the reevaluated patients, did physical rehabilitation after their medical discharge. According to the TUG 43,75% of the patients could not go outside alone or required a gait aid.
Discussion and conclusions: This analysis allows projections of future needs in terms of patient numbers, dependency and healthcare strategies particularly in order to avoid falls in a population essentially elderly with comorbidities that contribute to their previous status and postoperative evolution. Most results were consistent with previous data from the literature. There is still a lack of casuistic revisions about some of the parameters analyzed.

OP154
THE EFFECT OF PHYSICAL EXERCISES ON VENTRICULAR REMODELING , SERUM CARDIAC PARAMETERS AND FUNCTIONAL CAPACITY IN BREAST CANCER WOMEN DURING TRASTUZUMAB THERAPY

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Introduction: Almost one-third of breast cancers (BC) present with an aggressive form characterized by increased expression of human epidermal growth receptor 2 (HER2) proteins. A targeted treatment using monoclonal antibodies against HER2 expression such as trastuzumab has been shown to improve survival. Unfortunately, it causes heart failure and decline in left ventricular systolic function in 0.4% to 4.1% and decrease of physical funcioning.
Purpose: To examine the effect of supervised exercise (aerobic and strenght) training in mitigating trastuzumab on mediated left ventricular remodeling, serum oucomes, and physical capacity in women with HER2-positive BC.
Method: Eighteen women (mean age 51,2) with HER2-positive BC conducted regular physical exercise training (5/week) after the first 3 months of adjuvant trastuzumab. Patients underwent examination at baseline (T0), before starting physical training (T1) and at 6 weeks of training (T2), and 6 months (T3). Outcomes measures: heart function (echocardiography examination), 6MWT and step test, serum cardiac markers (N-terminal pro-brain natriuretic peptide [NT-proBNP] and galacetin-3) as well as levels of leptin, CRP, urea and creatynine.
Results: Peak ejection fraction was lower (P > .05) and functional capacity less decline (P > .05) after 3 months of study. Exercise training resulted resting end-diastolic and end-systolic volumes (P >.05), whereas ejection fraction not changed from baseline to post-intervention (P> .05). Elevations in NT-proBNP , galacetin-3, and leptin levels, parallel to the weight increase were observed in individual cases, but not on a group level.
Discussion and conclusions: Initiation of adjuvant trastuzumab therapy is associated with cardiotoxity by reduced ejection fraction and physical fitness what was well documented in many studies. A regular exercise training is good tolerated and may be prevent cardiotoxity for women with BC undergoing trastuzumab therapy. This study need to be continue in large patient groups.

OP155
UPPER LIMB STRENGTH AFTER NODAL SURGERY IN BREAST CANCER PATIENTS

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Introduction – The surgical treatment of breast cancer affects the shoulder strength, but there is lack of information about their kind, magnitude and impact.
Purpose – To assess the changes in shoulder strength of breast cancer patients during the first year after surgery; and to compare the effect of sentinel lymph node biopsy (SLNB) and axillary lymph node dissection (ALND) on shoulder strength.
Method – This was a prospective longitudinal observational study. A sample of 112 breast cancer patients were included, 44 underwent ALND and 68 SLNB. Main outcomes were shoulder strength of external rotators, internal rotators, abductors and serratus anterior, measured by dynamometry, both in the affected and the unaffected sides. Health related quality of life was measured by the FACT-B4. Evaluations were performed prior to surgery and at 1, 6 and 12 months after surgery.
Results – After ALND, strength of the affected side decreased significantly at the first month for external and internal rotators, without having recovered pre-surgery values after one year of follow-up: mean change 1.13 kg ($p=0.009$) for external rotators and 2.24 kg ($p<0.001$) for internal rotators. In contrast, loss of strength for patients treated with SLNB was only significant for serratus anterior at 12 months of follow-up (mean change 2.30 kg, $p=0.02$). The loss of shoulder range of motion was significant at 12 months only for the ALND group. Changes in the Arm sub-scale and the total FACT-B4 correlated positively with the changes in shoulder strength ($r= 0.295$-0.400).
Discussion and conclusions – One year after breast cancer surgery, patients had not recovered all their previous shoulder strength. The groups of SLNB and ALND showed different patterns of loss of shoulder strength across muscle groups. This provides important information for designing rehabilitation programs targeted specifically at the affected muscle groups after each nodal surgical approach.

OP156
MANUAL LYMPHATIC DRAINAGE THERAPY IN WOMEN WITH BREAST CANCER RELATED LYMPHEDEMA: A RANDOMIZED CONTROLLED TRIAL

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Introduction: Breast cancer treatment-related lymphedema is caused by disruption of the axillary bed by excision of lymph nodes and/or radiation therapy to the area.
Objective: The purpose of this investigation was to examine the effects of manual lymphatic drainage (MLD) on reducing the volume of lymphedema, improving the quality of life (QOL) the emotional well-being subscale, and shoulder range of motion among women with breast cancer-related lymphedema.
Materials and methods: A randomized controlled comparative trial with a 6-month follow-up period was conducted between January 2013 and June 2015. Fifty-two women with lymphedema (mean age of 54 years +/- 11 years) were randomly assigned to an intervention group (N=25) and control group (N=27). The subjects participated in the exercise group (EG) focused on combined MLD and exercise therapy, while control group performed compression bandages (CB) and exercise therapy without MLD. The primary study endpoint was the reduction in arm lymphedema volume, which was determined by measurement of circumference at two adjacent points compared with the non-affected arm, shoulder range of motion, and the QOL, assessed by the functional assessment of cancer therapy-breast (FACT-B) scale. The intervention was administered daily for four weeks and the patient's condition was assessed one and six months after treatment.
Results: Fifty-two of 73 women randomized (71.2%) completed the study. The findings demonstrate that MLD significantly reduces limb volume (difference, d=64, 95% CI=13-115, P=0.012). Quality of life, in terms of emotional function (d=6.7, 95% CI=2.1-11.2, P=0.004) and shoulder range of motion (2-6 degrees greater, P=0.05), were also significantly improved by MLD.
Conclusions: We conclude that 4 week of combined MLD program significantly improves QOL and shoulder range of motion reducing limb volume in breast cancer- related lymphedema. Future studies are needed to evaluate the effectiveness of similar exercise programs over longer periods of time.

OP157
ASSESSMENT OF THE EFFECT OF RELAXATION TECHNIQUES ON LYMPHEDEMA VOLUME, ANXIETY AND DEPRESSION IN THE WOMEN WITH LYMPHEDEMA MANAGED BY COMPLETE DECONGESTIVE THERAPY

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Introduction: Upper extremity lymphedema is one of the significant causes of mental and physical distress in the patients with breast cancer. High levels of anxiety and depression occur in the patients with lymphedema. The present study aimed to assess the effect of relaxation techniques on lymphedema volume, anxiety and depression in the women with lymphedema managed by Complete Decongestive Therapy (CDT).
Materials and methods: The present study was a quasi-experimental clinical trial, in which 31 women with lymphedema (with arm volume difference of higher than 200 cc) were assigned to control group (n=16) receiving CDT, and test group (n=15) receiving relaxation techniques, including progressive muscular relaxation, before CDT. Lymphedema was managed in two phases, the first one by the therapist at clinic lasting for 3 weeks (6 days a week) and the second one by the patient at home lasting for 4-6 weeks beginning after completion of the first phase. Data were collected by measurement of arm volume using volumetric tank, and anxiety and depression levels by using Hospital Anxiety and Depression Scale (HADS). Data were analyzed by SPSS, Ver. 19 and paired t test.
Results: Results of the study indicated that there was a significant difference between test and control groups in mean depression score in the first phase (p=0.01) and the second phase (p=0.002), and in mean anxiety score in the second phase (p=0.02). In addition, percent of reduced arm volume was higher in test group than in control group (63.5 v. 60.7).
Conclusions: Application of relaxation techniques reduces anxiety and depression scores and also arm volume in the patients with lymphedema.

OP158
EFFECT OF PHYSICAL EXERCISES TRAINING ON INFLAMMATION, FATIGUE AND AEROBIC CAPACITY - A 12-MONTH FOLLOW-UP STUDY WITH PROSTATE CANCER MEN UNDERGOING ANTIANDROGEN- AND RADIOTHERAPY

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Introduction: During antiandrogen and radiotherapy, prostate cancer (PCa) patients may report fatigue, which impairs functional capacity and psychological status as well as quality of life (QoL). Cytokines responses that could play a role in mediating radiation toxicity.
Purpose: To investigate the effectiveness of an 12-month physical exercises program on immune function, fatigue, as well as physical and psychological outcomes in PCa undergoing antiandrogen- and radiotherapy.
Methods PCa men (N=67) were randomly assigned to either an exercise group or a control group. The exercises group attended physical exercise sessions 3 times per week for 56 weeks. Sessions lasted 60 minutes in duration: 10 minutes of warm-up, 40 minutes of aerobic and endurance exercises, and 5 minutes of cool-down exercises. Patients in the control group followed a usual daily activity. Outcome measurements:The primary outcome of the study was a change in PCa relevant cytokines (interleukin 1â (IL-1â), IL-6 and tumour necrosis factor (TNF-á). Secondary endpoints are aerobic capacity f(6MWT), fatigue (FACT-F) and quality of life (EORTC). Assessments were conducted before, after a course of radiotherapy and at a 12-month follow-up in outpatients department.
Results: No significant differences existed between 2 groups at pre-radiotherapy assessment. At post-radiotherapy assessment, the exercise group showed significant within group improvements in: aerobic capacity (P<.05), fatigue (P=.102), total QoL (P=.023) physical well-being (P=.002), urinary symptoms (P=.02). Within the control group, there was a significant increase in IL-1â and IL-6 (P<.05), fatigue score (P=.04) at post-radiotherapy assessment. Between-group differences at 12 month follow-up postassessment were significant in TNF-á (P=.04), IL-6 levels (P=.012), aerobic fcapacity(P=.036), fatigue (P<.01), physical well-being (P<.001), social well-being (P=.002), and total QoL (P=.04).
Conclusion: A 12-month regular exercise program in PCa patients undergoing androgen- and radiotherapy improved pro-inflammatory cytokines levels, aerobic capacity , and overall QoL and prevented fatigue.

OP159
TECHNOLOGY USE AND PREFERENCE AMONG PHYSIOTHERAPY PATIENTS

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Purpose: The aim of this study was to assess the information and communication technology (ICT) use and preference among physiotherapy patients.
Methods: A cross-sectional study was conducted from December 2014 to August 2015. 42 patient reported variables – including socio-demographic, perspectives on ICT and health status – were collected. Health status, overall Health-Related Quality of Life (HRQoL), Ambulation Single-Attribute Utility Function (AmSAUF) and Dexterity Single-Attribute Utility Function (DeSAUF) were measured using Health Utilities Index Mark3 (HUI3) questionnaire.
Results: 266 physiotherapy patients [mean(SD) age: 55,3(±18,1); 58,3% female; 31,5% with rural residence] consented to participate in the study. Mean (SD) HRQoL scores for complete data (n=260) on HUI3 was 0.55(±0.32). Participants were classified by HRQoL as having severe disability (73,7%), moderate disability (14,7%), mild disability (10,5%) and none disability (1,1%). AmSAUF [mean(SD):0,83(±0,22)] and DeSAUF [mean (SD):0,95 (±0,12)] suggested that sensation, emotion, cognition, self-care and pain attribute level contribute to observed disability score. Participants reported lower use of electronic devices for physical activity monitoring (14,7%) compared with electronic devices for vital functions monitoring (62,4%), cell phones (98,9%) or smartphone (32,3%). The majority of participants with moderate disability (70,3% - 23 participants with level 1 AmSAUF and DeSAUF and 3 participants with level 2 AmSAUF and DeSAUF) indicate as important and very important the existence of ICT that may allows in-home physiotherapy sessions and reduction of number of trips related with physiotherapy. This group of patients prefer technologies that allow in-home physiotherapy by online training with a physiotherapists (51,3%) compared with smartphone or tablet games (25,6%).
Conclusions: The survey contributes to a more comprehensive description of health status and HRQoL of physiotherapy patients, the use and their perspectives on ICT for physiotherapy. Future studies should focus on determinants for awareness and knowledge on ICT that may improve quality of physiotherapy intervention and patients quality of life.

OP160
THE NOVEL TREATMENT OF EXTERNAL COUNTERPULSATION FOLLOWED BY INTERMITTENT THETA BURST STIMULATION FOR MOTOR FUNCTION RECOVERY AFTER ISCHEMIC STROKE

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Introduction Upper limb dysfunction is a common consequence following ischemic stroke. Previous studies have showed that the single application of external counterpulsation (ECP) or intermittent theta burst stimulation (iTBS) can effectively enhance the cortical motor excitability. However, it is still unknown whether there will be an augment treatment effect when these novel treatments are applied orderly.
Purpose A randomized controlled trial was designed to find out whether there was a synergistic effect of ECP followed by iTBS to upper limb function through the improvement in both the cerebral perfusion and neuron excitability.
Method Thirteen ischemic stroke patients within 21 days of stroke onset were randomized assigned into four groups: RR group (real ECP and real iTBS), real ECP group (with sham iTBS), real iTBS group (with sham ECP) and sham control group (sham ECP and sham iTBS). They received the baseline assessment of upper limb function (Fugl-Meyer Assessment (FMA)) before the treatment. ECP followed by iTBS were performed one session per day, totally 10 sessions. Follow-up assessment was performed at both immediately after the tenth session and 90 days after treatment. The iTBS was applied in the primary motor cortex (M1), which was determined as the mirror position where the single pulse stimulation produced maximal motor evoked potential in the unaffected first dorsal interosseous muscle.
Results There were only significant differences among four groups in the changes of sub-score of hand movement in FMA before and immediately after treatment ($p=0.047$).
Discussion and conclusions The pilot results suggested that this combination treatment was helpful to improve hand function in subacute ischemic stroke survivors. This novel treatment showed an augmented effect on motor function recovery, and this effect was better than the isolated treatment. This is important evidence for illustrating stroke recovery from the hemodynamic basis to neurophysiological application in cortical excitability.

OP161
THE EFFECTIVENESS OF REHABILITATION APPLING MODIFIED, TWO PHASES, STATIONARY REHABILITATION MODEL FOR PATIENT AFTER POLYTRAUMA

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Introduction: Polytrauma patients need a serious treatment and long rehabilitation. Such injuries can have biopscyhosocial consequences, often causing disability. Appropriate and timely rehabilitation can alleviate biopsychosocial disorders.
Purpose: Compare two models of comprehensive rehabilitation programs for patients after polytrauma.
Methods: Patients were brigaded in control and study groups. Stationary rehabilitation of study group patients was divided into two phases. First phase was before standing, second when patients can bear weight on lower extremities. Control group had standard rehabilitation method. These data of patients was analyzed (Keitel index, Barthel index, FIM index, rehabilitation duration).
Results: 49 patients (20 females and 29 males). The age average was 46.16 (SD17.45) years. The male suffered polytrauma 1,5 time often than female. The number of injured body areas mostly was three (44.9%). Main trauma mechanisms were: traffic accidents – 53.1%, fall from height – 28.6%. Patients in the rehabilitation came 72.93 (SD58.73) days after trauma. An average duration of rehabilitation in study group was 31.9 (SD6.31) in control – 29 (SD6.39) days. In study group significantly ($p<0.05$) improve these tests results: Barthel index, modified Keitel index, in control – Barthel index, Keitel index, FIM. Comparing results between groups all tests results in study group were significantly higher.
Discussion and conclusions: The duration of rehabilitation comparing between groups was similar. The patient functional independence and functional activities results after modified, two phases rehabilitation model was better comparing with patient after standard rehabilitation, all tests results in study group after rehabilitation were significantly higher: Keitel, modified Keitel index and Barthel index ($p<0.05$), FIM ($p<0.001$).

OP162
THE INFLUENCE OF IMMOBILIZATION AND PHYSICAL EFFORT ON SOME LYSOSOMAL ENZYME ACTIVITY IN HEPATOCYTES OF EXPERIMENTAL MICE

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Introduction Characteristic type of loading physical stressor is immobilization, during which induced animal reveals the strong defensive reactions. The time of different defensive reactions caused by stressor action can differ and it not always leads to adaptation, however it can cause many pathological changes.The unsettlement of previous metabolic balance manifests in dystrophic processes or in many physiological disorders, especially important in case of immobilization. The lysosomal system has been described as the main place for intracellular catabolic processes.
Purpose The influence of immobilization and physical effort on some lysosomal enzyme activity in hepatocytes of experimental mice.
Materials and methods The study was conducted on 30 randomly chosen Swiss mice. The mice have been divided into three groups: 1) control, 2) test group after immobilization, 3) test group after physical effort. Immobilization consisted on the place of animal in the metal nets, so called ladies hair curlers, for 12 hours. The physical effort was defined as 3 min. of swimming in the water of 21-22°C temperature. In received this way lysosomal fraction the activity of lysosomal enzymes was indicated: alanine aminopeptidase, leucine aminopeptidase, acid phosphatise and lysosomal esterase.
Results Immobilization and physical effort (swimming) caused in experimental animals, in comparison to control group, decrease of activity of all tested enzymes.
Conclusions Both types of implemented stressing factors decreased the activity of studies enzymes in many cases high significantly. This phenomenon can be characterized as an adaptation to new metabolic homeostasis which was created in the cell. In standard physiological conditions the organism derives its energy on highly economical way by using the most cost-effective speed of changes, while the surplused part of created energy it stores in the form of reserve fat.

OP163
REHABILITATION OF NEUROMUSCULAR DISEASES - AN OVERVIEW

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Introduction: Neuromuscular diseases (NMD) are predominantly chronic progressive diseases. They may start in childhood as well as later on. Often NMD affect adults in their most active phase of life and interfere with activity, participation and quality of life.
Purpose: The purpose of this review is to give an comprehensive overview about the rehabilitation of neuromuscular diseases based on the recent literature.
Methods: The recent literature was defined as original papers, reviews and book chapters published within the last five years.
Results: There are many different clinical presentations, therefore treatment goals depend on the specific diagnosis and individual course of disease and the individual needs of the patient.The clinical presentation of patients include muscle weakness, fatigue, loss of sensation, reduced dexterity and coordination,loss of gait, deformities of feet and spine, primary and secondary pain as well as disturbances of the autonomous nervous system, including sexual dysfunction. Moderate resistance training can improve strength in neuromuscular disorders and strength gains tend to be greatest for muscles with at least antigravity strength . Moderate intensity exercises are safe and well tolerated by patients with at least antigravity strength. To train ambulation water based exercises might be very helpful. Occupational therapy in neuromuscular disorders includes functional training, adaptation of working place and home environment. Splints and orthosis are prescribed to support weak muscle groups and enhance function and to counteract contractures. Electrotherapy and massage techniques may be used as pain treatment or to improve motor performance.
Conclusions: Anticipation of symptoms, regular medical controls, sufficient rehabilitation therapy and good health care management is important to achieve the optimal outcome for the individual patient and his family. Therefore, personalized medicine is the key strategy for treatment of patients with NMD.

OP164
REHABILITATION MODELING VIDEOS IN SPINAL CORD INJURY: FROM A PROTOTYPE PRODUCTION TO IMPACT EVALUATION

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Introduction: The loads of information provided by new technologies have considerably altered methodologies of patient education. The way people search for information or the way information is brought to them has determined the need for its rigorous triage.
Purpose: Due to the scarcity of evaluation studies on the impact of online videos about spinal cord injury (SCI), we conducted this study to produce evidence on how modeling videos can influence self-care training of people with SCI.
Method: A quasi-experimental quantitative (pretest- posttest) design was used to conclude evidence on the impact of modeling videos among patients with SCI in terms of acquired motor skills and their immediate knowledge retention.
Results: Motor skills have highly improved among participants with the use of 3 videos. Moderate improvements were found with the use of one of the videos and a small improvement was found with another one. Immediate knowledge improvements were found regarding all videos, when comparing evaluation moments (T1-T2).
Discussion: The impact evaluation of the modeling videos focused exclusively on 5 videos due to time limit. Similarly to the previous studies, there was an increase in the motor skills of the participants and a knowledge retention increase about the self-care techniques under study, as in other studies. The evaluation of the motor skills of the participants was carried out by 5 independent assessors. This evaluation, besides strongly agreeing with values of significance very close to one (p»1, ANOVA test) among assessors, has revealed a significant increase in the motor skills of the intervention group participants in the 5 study techniques (p=0.001 and p=0.000).
Conclusions: Videos have shown a positive impact among the intervention group both in terms of motor skills and immediate knowledge gains.

OP165
EVALUATION OF A CLASSIFICATION FOR ADULT PATIENTS WITH HEMIPARESIS IN CHRONIC PHASE

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Introduction: Adult patients with hemiparesis related to a central nervous system lesion, often present reduced walking capacity and worse gait quality. While similar gait patterns can often be observed clinically, so far, there is no classification system to group these patients' gait abnormalities at the level of the ankle, knee and hip joints.
Purpose: This study has intended to put forward a new gait classification for adult patients with hemiparesis in chronic phase.
Method: 26 adult patients with hemiparesis in chronic phase (10 women/16 men) underwent a clinical examination followed by a clinical gait analysis (CGA), and complemented by a video analysis. An experienced doctor then classified each patient. The proposed classification consisted of 3 groups, each divided in 2 subgroups. Their definitions were based 1) on ankle, knee and hip kinematic abnormalities observed on video, and 2) on lower limb flexor muscles strength assessed during the clinical examination. To evaluate the discriminatory characteristics of the classification, an analysis of variance (ANOVA) was performed on the basis of 25 parameters including gait velocity and kinematic parameters quantified by CGA.
Results: 16 out of 25 measured parameters revealed significant differences (p-level<0.05) between at least 2 groups. Sub-groups were also statistically differentiated by 5 parameters out of 7 concerned.
Discussion and conclusions: This classification, which can be used in clinical practice, enables patients to be grouped on the basis of key abnormalities observed whilst walking. It should allow a decision-tree of therapies to be developed based on the groups in which the patients have been categorised. However, this study has to be extended to a larger number of patients, involving those in acute phase. Moreover, inter-operator repeatability should be evaluated.

OP166
INTRA AND INTER-RATER VARIABILITY IN SHOULDER MOTION MEASUREMENT USING DIGITAL INCLINOMETER

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Introduction: Shoulder range of motion manual measurement is subject to considerable variability between both measurements and raters. Smartphones equipped with internal inclinometers offer new possibilities but its accuracy and remains to be determined.
Purpose: To ascertain intra and the inter-rater reliability of shoulder motion evaluation using a digital inclinometer (through a smartphone app – getmyrom 1.03) in two classic positions: standing (St) and supine (Su) measuring active flexion (AF) and external rotation (ER).
Method: 16 healthy volunteers were selected. Measures were taken by two independent raters at two different times, a week apart. Order of participants and measurement sequence was randomized. Both raters were blinded to the results of intermediate measurements, which were subsequently analyzed by a third independent researcher. Raters were trained according to a predetermined measurement protocol. The intra and the inter-rater reliability was quantified using the intraclass correlation coefficient (ICC). Limits of agreement were established in accordance with the Bland and Altman method.
Results: The intra-rater ICC was good regarding the ER-St_{ICC} 0,91 (IC 95%: 0,72-0,97), ER-Su_{ICC} 0,92 (IC 95%: 0,76-0,98)) and AF-St_{ICC} 0,89 (IC 95%: 0,67-0,97). It had worse results in AF-Su_{ICC} 0,81 (IC 95%: 0,48-0,94). The interrater reliability was also good in ER-St_{ICC} 0,86 (IC 95%: 0,66-0,95), ER-Su_{ICC} 0,88 (IC 95%: 0,70-0,96) and AF-St_{ICC} 0,90 (IC 95%: 0,74-0,96)) and equally lower in AF-$_{ICC}$ 0,78 (IC 95%: 0,47-0,92).
Discussion and conclusions: The digital inclinometer revealed a good intra and inter-rater reliability mostly in ER (regardless of positioning) and in standing AF. Digital inclinometry might be a promising adjunct to physical examination but applicability to clinical settings is lacks sufficient evidence.

OP167
RECOVERY OF FUNCTIONING AFTER SCI: 10 YEAR LONGITUDINAL STUDY

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Introduction: Functional problems changing over the time since Spinal Cord Injury (SCI) onset. During rehabilitation functioning is related with changes of physical and functional state. After discharge, functioning more related with physical activity, environment adaptation and social relationships. Occupation improve over the time and related with social interactions, friends and disabled people support.
Purpose: To investigate the changes of functioning and functional problems over the 10 year period after SCI.
Methods: The preliminary data were collected during inpatient SCI rehabilitation program in Rehabilitation, Physical and Sports medicine center, Vilnius University Hospital, whereas the follow-up data was collected at a Lithuanian Paraplegics Association. Instruments: ICF Core Set for SCI in post–acute context, ICF Core Set for SCI in long-term context, FIM test and Life Situation Questionnaire – revised.
Results: In total 219 participants: physical FIM level significantly increased within first 2 years after SCI onset, ADL level increased during 5 year, and there are not significant changes of FIM score in a 5 – 10 years period ($p>0.05$). Significantly frequent Functional problems over 1 – 3 years as Muscle functions, Physical endurance, Balance, Sensory functions influenced activities (Changing and Maintaining body position, Transferring, Lifting and Carrying objects, Moving around). Functional problems over 3 – 5 years as Muscle functions, Neuropathic pain, Body weight maintenance more influenced activities (Washing oneself, Dressing, Preparing meals, Doing housework, Moving around, Hand fine use). Involvement in a life over 5 – 10 years more related with Social interactions, engaging in Community and Physical activity. Physical activity significantly increase over first 3 years, but decreased over 5 – 10 year, when more dominated participation in professional sports, active leisure and games.
Discussion and conclusions: Given the various changes of functional problems over the time, we can state that functioning will inevitably be associated with functional problems changes in the certain period.

OP168
EVALUATION OF URINARY TRACT INFECTIONS AND ANTIMICROBIAL RESISTANCE IN A SCI REHABILITATION UNIT

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Introduction: Urinary tract infection (UTI) is a prevalent comorbidity in a spinal cord injury rehabilitation unit (SCIRU). In these patients, the UTI is often recurrent and the resistance to antibiotics most frequently used has been growing.
Purpose: Identify and characterize the bacterial spectrum and susceptibility to antibiotics of neurogenic bladder UTI in a SCIRU. Determinate the infection according to voiding method and American Spinal Injury Association Impairment Scale (AIS).
Method: We made a retrospective analysis of 79 patients hospitalized in a SCIRU since 1/09/2014 until 1/09/2015. 158 urine samples were evaluated. The urine samples were collected every time there was a clinical suspicion of UTI. The analysed variables were: gender, age, AIS scale, antibiotic used in each infection, microorganisms isolated in the urine cultures, voiding method at the time of the infection and the antibiotics resistance profile.
Results: We found 75.9% of UTI's in our SCIRU, mainly in those using a urinary catheterization technique. Patients with indwelling catheterization had a higher number of UTI's than those with intermittent catheters ($p<0.05$). Spontaneously voiding patients suffered fewer infections (73.7%). The most common bacteria isolated were Klebsiella pneumoniae (43%) and Escherichia coli (22.8%). 71,5% of the isolated bacteria were multidrug-resistant. The highest rates of resistance (82%) were found among patients in indwelling catheterization ($p<0.05$).
Discussion and conclusions: Klebsiella pneumoniae was the most frequent bacteria causing UTI in our Unit. Our results are consistent with the increasingly higher resistance to antimicrobial therapy reported in the literature. Intermittent catheterization is a better method of bladder management, since most of the UTI's were found in patients with indwelling catheters. These results confirm the importance of preventing antimicrobial resistance and the strategies to prevent UTI's.

OP169
HOW TO CONTROL MOTOR IMAGERY TRAINING IN GRASPING REHABILITATION AFTER TETRAPLEGIA

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Introduction: Motor Imagery (MI) has been shown to be effective for grasping rehabilitation after C6-C7 spinal cord injury (SCI). This requires high MI quality that can be assessed using both self-ratings of vividness, and mental chronometry (based on the principle of temporal equivalence between MI and physical practice (PP)). However, it is unknown whether tetraplegia and/or MI training during grasping rehabilitation affect the MI quality.
Purpose: i) measure the impact of tetraplegia on MI quality by comparing kinesthetic imagery (KI) to visual imagery (VI) respectively, ii) determine whether MI training influences MI quality.
Method: 6 chronic C6-C7 SCI inpatients performed 15 MI training sessions over 5 weeks (3 sessions per week). During each 45 minute-session, first they performed PP then MI (successively VI and KI) with a ratio from 1:6 to 1:9. Participants trained both single-joint movement (e.g. wrist extension or tenodesis grasp) and multiple-joint movements (e.g. reach-to-grasp). Actual (PP) and mental (MI) durations were measured. Participants self-rated MI vividness using a visual-analog scale. Paired t-test and linear mixed models were applied for the statistical analysis.
Results: For single- and multiple-joint movements, i) VI duration was significantly shorter than KI by 12%, ii) VI and KI vividness significantly increased by 7% and 32% respectively while MI/PP time ratio decreased across the 15 MI training sessions, approaching 1. However, only VI/PP during multiple-joint movements was statistically significant.
Discussion and conclusions: C6-C7 SCI participants slow down KI as compared to VI, probably to maintain imagery vividness despite partial sensorimotor upper limb impairment. MI training improves MI quality by increasing MI accuracy and improving its temporal organization for both VI and KI. Hence, measuring vividness and movement duration during MI training is recommended after tetraplegia to control MI quality and ensure MI effects on motor performance.

OP170
INTERACTION OF BONE AND MUSCLE AFTER SPINAL CORD INJURY

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Introduction: Spinal cord injury (SCI) causes inactivation and, consequently, unloading of affected skeletal muscle and bone.
Purpose: This cross-sectional study investigated correlations of muscle and bone in spinal cord injured compared with able-bodied subjects.
Method: Thirty one complete SCI paraplegics (AIS A) were divided according to the neurological level of injury (NLoI) in group A (n=16, over thoracic (T) 7 NLoI, age: 33±16 years, duration of paralysis (DoP):6±6 years, and group B (n=15, T8-T12, age: 39±14 years, DoP: 5.6±6 years), compared with 33 controls (group C). All were examined with peripheral quantitative computed tomography (pQCT) at 66% of tibia's length (cortical bone and muscle area, bone/muscle area ratio).
Results: In able-bodied subjects cross sectional muscle area was correlated with bone area ($p<0.001$, $r=0.88$). Body mass index was significantly lower in paraplegics ($p=0.02$). Groups A and B differed significantly from control group according to bone and muscle area ($p <0.001$). In paraplegics less muscle per unit of bone area (bone/muscle area ratio) was found compared to controls ($p <0.001$). Cortical bone area was negatively strong correlated with DoP in total paraplegic group ($r=-0.66$, $p<0.001$) and group A ($r=-0.76$, $p=0.001$ vs. $r=-0.52$, $p=0.123$, respectively). Muscle area and bone/muscle ratio area correlations in paraplegic groups with DoP were weak. Paraplegics who performed standing and therapeutic walking had significantly higher bone area ($p=0.02$ and $p=0.013$, respectively).
Discussion and conclusions: The relationship between bone and muscle was consistent in able-bodied and predictably altered in those with spinal cord injury, a clinical disease affecting bone and muscle.

OP171
NATURAL KILLER (NK) CELL FUNCTIONALITY AFTER SPINAL CORD INJURY (SCI): A PROSPECTIVE, LONGITUDINAL STUDY

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NK cells belong to the first line innate immune defence. Contact with infected cells promptly triggers NK cells' cytokine and chemokine production as well as activation of its lytic weaponry without prior sensitisation. The prognostic study investigates a multi-sided NK cell functional deficit developing after spinal cord injury (SCI). SCI leads to the interruption of the neural tracts at the lesion site and thus also results in a disruption of the physiologically well-balanced communication between immune system and the central nervous system (CNS), the so-called spinal cord injury-induced immune depression syndrome (SCI-IDS). The SCI-IDS contributes to the increased susceptibility to infections, which constitute the leading cause of death during the post-acute and chronic phases after SCI. Here, we assess within a longitudinal two-center trial multiple components of Natural Killer (NK) cell effector functions after human SCI.. We subjected NK cells to different stimulatory paradigms at three different time points after the lesion – 7 days, 14 days and 10 weeks. Subsequently, we tested NK cells regarding cytotoxicity (CD107a expression) and production of immune modulatory cytokines, namely Interferon-gamma (IFN-g) and tumour necrosis factor-alpha (TNF-a) using flow cytometry. All three functional parameters were markedly decreased in SCI patients 10 weeks after injury compared to patients with a vertebral fracture but uninjured spinal cord and with healthy age-matched controls. This confirms for the first time that CNS-specific mechanisms are behind this immune deficit.

OP172
REHABILITATION RESULTS OF PATIENTS WITH ACUTE TRANSVERSE MYELITIS, 10 YEARS EXPERIENCE OF A REFERRAL CENTER IN PORTUGAL

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Introduction: Acute transverse myelitis (ATM) is a group of disorders characterized by acute non-traumatic inflammation of the spinal cord, resulting in motor, sensory and/or autonomic dysfunction with a defined sensitive level and onset from hours upto 21 days. Literature suggests that it is difficult to predict functional outcome based on initial presentation, but almost 42% of patients have a good recovery. Our purpose is to assess the functional evolution with an inpatient rehabilitation program of patients with ATM, over a 10 year period.
Materials and methods: A descriptive observational study, based on data collected from medical files of patients with myelitis, encephalomyelitis and transverse myelitis, admitted for their first inpatient rehabilitation program between 2005 and 2014. Spinal injury was classified according to the American Spinal Injury Association Impairment Scale (AIS) and functionality was assessed by the Functional Independence Measure (FIM) at admission and discharge. Statistical analysis was performed using the Hypothesis Test for population proportion.
Results: The final sample was 56 patients, average age 41 yo, 50.53% male. The most frequent etiology was idiopathic (57.1%). Clinical features at admission were: paraplegia (67.85%), tetraplegia (30.35%) and one case of tetraparesis. Regarding AIS on admission, 18% were A, 11% B, 33% C and 38% D, having evolved to 16% A, 9% B, 27% C, 47% D at discharge. Functional status (FIM) at admission was in average 77, with motor sub-score 44 and at discharge 101 and 67 at discharge, the correlation between scores was positive and significant. Length of Stay on inpatient rehabilitation program was 94 days, average.
Conclusions: Significant functional improvement in patients with ATM is possible with an intensive, inpatient rehabilitation program. Age and severe neurological status on admission seemed to influence the functional outcome in our study. Larger controlled randomized studies in rehabilitation of ATM are necessary.

OP173
OUTCOMES OF CRYOPRESERVED SPERM IN CASE OF SPINAL CORD INJURY IN LYON, IN FRANCE

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Introduction Sperm cryopreservation can be offered to men with spinal cord injury, as only 10% of spinal cord injured men (SCI) can have a child without Assistive Reproductive Technologies (ART). Our study aims to analyze the outcomes of these cryopreservation, namely their use or not for an ART, and to evaluate the success rate in case of AMP.
Method In may 2015, we retrospectively identified all people with stable spinal cord injury sent to the CECOS (Centre d'Etudes de la Conservation des Œufs et du Sperme: Egg, Sperm Embryo banking) by the department of neuroperineology based in the hospital Henry Gabrielle, for the first time between 1st January 2009 and 31st December 2013, to undergo a sperm cryopreservation of spermatozoa.
Results In may 2015, among the 65 men surveyed, 22 had a medical consultation as a couple for an ARP. Among these 22 couples, 11 have engaged in a program of medically assisted procreation. 33 trials of medically assisted procreation were realized : 5 intra-uterine inseminations (IUI), 18 In Vitro Fecondation (IVF) with intracytoplasmic sperm injection (ICSI) and 10 frozen embryo transfers (FET). 11 clinical pregnancies were obtained. 6 pregnancies were completed and 7 children were born healthy. 6 of 11 couples had at least one child.
Discussion and conclusions As sperm cryopreservation after a spinal cord injury is still debated, our study helps to assess the results of this very specific and multidisciplinary ART care, which remains largely uninvestigated, in order to optimize its effectiveness.

OP174
THE DEVELOPMENT OF THE FIRST GREEK SPINAL CORD UNIT. PAST – PRESENT – FUTURE. THE RIO SCI RESEARCH PROJECT

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Introduction In Greece, the lack of a spinal cord injuries (SCI) unit has as a consequence the distribution of patients in different general rehabilitation centers with negative effect to the quality of care. Specialized centers dedicated to SCI management could improve quality of care and reduce cost, due to lower rates of complications and shorter in-patient length of stay.
Purpose To present the efforts for creating the first SCI unit in Greece. To describe the achievements so far, the present situation and our vision for the future. Finally to present our strategy towards the development of the Rio SCI Research Project.
Method The Rio SCI unit was founded by private sponsorship in 2010. It belongs in the General University hospital of Patras, the third larger city of Greece, covering population of about a million people.
Results Unfortunately the foundation coincided with the economic crisis in the country. As a result many services are not fully developed due to underfunding. The lack of sources mainly affects the outpatient services and the efforts toward independence in homes, work places and leisure time.
Discussion and conclusions Community reintegration is an important issue, especially in places with huge environmental barriers. In general, patients are not adequately prepared to live in the community and there are gaps between the skills taught in rehabilitation settings and those required in the community. Our intention is to document unmet needs of paraplegics and tetraplegics in the community in order to provide specialized help. This requires an interrelationship between medical care – rehabilitation – community integration and long term care. In addition, our services and resources will be coordinated with the university in order to maximize community resources and ensure optimal patient care and distribution of information to our patients and staff. Finally, further collaboration may be achieved, through research involvement.

OP175
THE EXOSKELETON, FIRST EXPERIENCES IN PATIENTS WITH SPINAL CORD INJURY IN THE NETHERLANDS

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Introduction An innovative therapy in the rehabilitation of patients with spinal cord injury (SCI) is the use of exoskeletons. Exoskeleton training is used to improve walking ability and may counteract some of the systemic impacts of immobility and diminished weight bearing. Apart from limited evidence on the effectiveness of exoskeleton training, knowledge on energy expenditure and on muscle activation during walking in an esoskeleton is limited as well.
Purpose To describe energy expenditure and muscle activity for walking with and without Ekso robotic exoskeleton. Furthermore to share our first experiences on the feasibility within our clinical setting.
Methods to measure energy expenditure and muscle activity patients performed three trials 1. Ekso walking with full support 2. Ekso walking with partial support 3. walking without Ekso using a cane. Oxygen uptake (VO2) and hart rate (HR) were monitored to determine energy expenditure. Muscle activity was measured using surface electromyography. Time to put on the eksoskeleton and effective therapy time was also measured.
Results energy expenditure was highest during Ekso walking with partial support, followed by full support and without Ekso. Muscle activity of the calf muscles was lower during walking in Ekso whereas the hamstrings and rectus femoris showed higher activity compared to walking without Ekso especially during terminal stance. Time to put on the suit decreased from 45 minutes to 10 minutes per therapy session. Also the effective therapy time increased.
Discussion and conclusions Ekso walking induces high physical strain and a different coordination pattern compared to no-Ekso walking. Ekso seems feasible during rehabilitation.

OP176
HIP AND KNEE JOINT LOADING DURING AQUATIC EXERCISE – THE LOAD REDUCING EFFECT OF WATER

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Introduction Aquatic exercises enable mobilization and muscle strengthening. Due to the waters buoyancy, low loading of the lower extremity is assumed and water gymnastics are therefore recommended for patients with osteoarthritis or following joint replacement [Hochberg 2007]. However, so far joint loading in water has been determined only indirectly [Miyoshi 2005] and profound knowledge is lacking.
Purpose The aim of this study was to measure hip and knee joint loading during aquatic exercise in vivo and to investigate the load reducing effect of water.
Method Instrumented implants with telemetric data transfer were used to measure hip and knee joint contact forces in vivo [Heinlein 2007, Damm 2010]. Twelve patients with instrumented prosthesis (6x hip, 6x knee) performed the following exercises in water (chest-height) and on land: one-legged stance, walking, knee bend, high-knee-running. Resultant joint forces were measured and are reported in % bodyweight (BW).
Results The maximum joint forces during one-legged stance, knee bend, walking and high knee running on land were on average 293/252%BW (hip/knee), 263/258%BW, 276/252%BW and 443/446%BW. During the same activities in the water the joint loading was distinctly smaller and decreased by 58/58%, 58/67%, 34/56% and 39/37%. Except for knee joint loads during high-knee-running all force reductions were statistically significant ($p<0.05$, Wilcoxon test).
Discussion and conclusions With up to 67% force reduction, the results demonstrated a clear load reducing effect during weight-bearing activities in water. However, also in the water joint forces reached peak values of up to 368%BW during dynamic activities. In the early rehabilitation phase those activities should therefore carefully be considered. This study is the first one reporting in vivo measured joint forces during aquatic exercises and will help to determine an appropriate treatment program in the rehabilitation process. This study was supported by DFG (KU 3213/2-1) and Olympiastützpunkt Berlin.

OP177
PREHABILITATION USING 8-WEEK HOME EXERCISE PROGRAMME INCREASES THIGH MUSCLES ACTIVATION IN PATIENTS WITH SEVERE KNEE JOINT OSTEOARTHRITIS

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Introduction Knee joint osteoarthritis (KOA) is diagnosed in 6% of people older than 30 years (Michael et al, 2010). From the 5th decade KOA affects more women than men (Lawrence et al, 2008). In the present study the effect of prehabilitation using 8-week home exercise programme (HEP) on thigh muscle activation during gait was investigated in women with KOA undergoing total knee arthroplasty (TKA).
Methods Seventeen women with late stage KOA (mean age 62 years) scheduled for TKA, who performed the 8-week HEP and ten age-matched healthy women participated in this study. Self-reported function of the knee joint was evaluated by the WOMAC scores. Thigh muscle isometric maximal voluntary contraction (IMVC) force, knee flexor and extensor muscles EMG activity, and ground reaction force (GRF) were measured bilaterally during gait on force platform.
Results Women with KOA demonstrated decrease of pain in WOMAC index ($p<0.05$) and an increase of IMVC force of both knee extensor and flexor muscles after performing HEP. Gait characteristics don't change significantly, but differences between patients and controls decrease. As compared to controls, decrease of thigh muscles IMVC force was maintained after HEP performing. There was no significant difference in the time of the heel strike and the vertical component of GRF during heel strike in the prehabilitation group, but at the heel strike of involved leg increased EMG activity ($p<0.05$) of rectus femoris and vastus medialis muscle was noted.
Discussion and conclusions Study demonstrated that 8-week prehabilitation using home exercises programme increases thigh muscle activation and muscle strength and decreases knee pain in patients with KOA undergoing arthroplasty. It is found that in KOA patients' muscle activation during gait is lower than in healthy age-matched individuals (Rutherford et al, 2011). It can be recommended to use prehabilitation HEP programme in clinical practice.

OP178
EFFICIENCY OF COMPLEX REHABILITATION PROGRAM FOR PATIENTS WITH RHEUMATOID ARTHRITIS

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Introduction. Rehabilitation techniques give the people with rheumatoid arthritis (RA) the strategies necessary to manage their disease in addition to medical treatment.
Purpose. To evaluate the efficiency of complex rehabilitation program for patients with RA within 6 months.
Method. 64 patients with RA were included. 34 study group patients underwent drug therapy and complex rehabilitation. The rehabilitation program consisted of hospital stage (2 weeks): local air cryotherapy (–60°C) for joints for 15 min, 45-min therapeutic exercises under the supervision of a trainer, 45-min occupational therapy, 10 sessions, education program (4 daily 90-min studies) and outpatient stage (6 months): 45-min home-based exercises 3 times a week, wrist, knee and foot orthoses. 30 patients received only drug therapy (control). Tender and swollen joint count, erythrocyte sedimentation rate (ESR), joint pain on 100-mm visual analogue scale (VAS), Disease Activity Score (DAS28), Stanford Health Assessment Questionnaire (HAQ), Rheumatology Assessment Patient Index Data (RAPID3), hand grip strength, the average powers of knee extension and ankle flexion by EN-TreeM movement analysis were evaluated at baseline and at 6 months.
Results. After 6-month rehabilitation tender joint count decreased by 72,3%, swollen joint count – by 74,1%, ESR – by 58,2%, joint pain - by 70,4%, DAS28 – by 1,38±0,2, HAQ – by 0,97±0,56, RAPID3 – by 5,98±1,25 ($p<0,01$). The grip strength of a more affected hand elevated by 44,9%, the average extension power of a weaker knee joint – by 88,7%, the average flexion power of a more affected ankle joint – by 81,6% ($p<0,01$). The changes in the control group were less pronounced, which determined statistically significant differences between the groups in all parameters ($p<0,05$).
Discussion and conclusions. 6-month complex rehabilitation program increases functional ability and motion activity, relieves pain, helps to control diseases activity and improves quality of life in patients with RA.

OP179
INTRA-ARTICULAR INJECTION IN KNEE OSTEOARTHRITIS TREATMENT: CORTICOSTEROIDS, HYALURONIC ACID, PLATELET RICH PLASMA OR NONE? – A COMPARATIVE STUDY

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Introduction: Osteoarthritis is the most common form of joint disease.The progressive understanding of the disease pathophysiology, the perception that the process is not only purely mechanical and degenerative "wear and tear" as well as the clarification of the inflammatory pathways involved in the pathological mechanism, allowed an openness to new approaches, new therapeutic applications and new techniques.
Purpose: The goal of this study is to compare three types of minimally invasive procedures commonly used for the treatment of moderate knee osteoarthritis, either between them or with placebo.
Method: Randomization of a cohort of 100 patients with the diagnosis of knee osteoarthritis, sustained by the clinical and the imaging evaluation, will be held and distributed in 4 distinct groups of 25 patients each: Group A (intra-articular infiltration with hyaluronic acid), Group B (intra-articular infiltration with platelet rich plasma), Group C (intra-articular infiltration with corticosteroids) and Group P (subcutaneous injection with lidocaine). All patients had knee osteoarthritis grade II / III Kellgren-Lawrence (radiological classification). Analysed outcome measures will be pain (by visual numeric scale (VNS)) and function (by the WOMAC scale), before the intervention, 1st month and 3rd month after the intervention.
Results: The preliminary results, at 1st month of follow up, indicates that the Group C presents better results in matter of pain decrease and function optimization.
Discussion and conclusions: This study will take place until the 3rd month after the intervention, in order to assess which of the studied techniques offers the greatest benefit in controlling pain and functional gain, either in short term or in medium term. Consequently, we will assess if some of these techniques show statistically significant benefit when compared with each other and with placebo, allowing us to define the actual role of each of these new interventions in the treatment of knee osteoarthritis.

OP180
THE EFFICACY OF VERY LOW LEVEL LASER THERAPY ON PROOXIDANT METABOLISM AND DISEASE ACTIVITY IN RHEUMATOID ARTHRITIS PATIENTS. PLACEBO CONTROLLED DOUBLE - BLIND INVESTIGATION

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Introduction. Cells of patients with Rheumatoid arthritis (RA) generate a large amount of reactive oxygen species and monoxide nitrogen (NO), that is one of the cartilage and bone tissue destruction causes, maintaining the inflammatory process and disease activity. The damaging effect of the NO mediated primarily due to peroxynitrite correlate with clinical and laboratory parameters of disease activity. The main advantage of Disease Activity Score (DAS28) is intended not only to monitor the effect of therapy but also accurate monitoring of disease activity individually.
Purpose The study aim was to examine the effect of pulsed very low level laser therapy (vLLLT) in a randomised, placebo-controlled double-blind investigation, in an acute RA stage, by monitoring the DAS 28 and prooxidant status (peroxynitrite, superoxide anion radical by phorbol myristate acetate -PMA stimulated and unstimulated cells).
Method According to ACR criteria, 136 patients belonged to the elementary and 30 to the placebo-control group (sham laser) applied for 10 consecutive days (ë=890nm, pulse power 7 W, exposure time 60-240 sec. per point). Dose per one treatment ranged from 0.035J to 7.32 J and energy density from 0.008 J/cm^2 to 0. 16 J/cm^2 were individually selected.
Results The elementary group showed significantly decreased values of DAS28 ($p<0.01$) while it increased in the placebo group ($p<0.01$). Before the treatment non-activated superoxide production and peroxynitrite production, by neutrophils in RA patients, was elevated in both groups ($p<0.01$), while after vLLLT it was decreased only in elementary group ($p<0.05$; $p<0.01$). Placebo group was not shown any significant changes. Using PMA as additional stimulus not lead to further activation of the cells, indicating that cells have already been primed.
Discussion and conclusions This placebo-controlled investigation proved that vLLLT, under optimal chosen irradiation parameters and strictly selected application site, decreases the activity of DAS28 and prooxydant activity.

OP181
TREATMENT OF MYOFASCIAL PAIN IN PATIENTS SCHEDULED FOR HIP REPLACEMENT

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Introduction: Hip osteoarthritis (HOA) severely impairs daily activities because of pain and limitations of mobility. Hip replacement (HR) is a very effective treatment approach for severe derangements of this joint, but in Brazilian public health system this surgical procedure may be delayed for years due to the small financial resources for surgical implants, clinical complications of these individuals and lack of skilled orthopaedic services. Thus, conservative interventions to reduce pain and improve functioning in these patients are mandatory.
Purpose: to test efficacy of the treatment of myofacial pain component compared to physical therapy in patients with severe HOA scheduled for HR in terms of pain control and functional improvement.
Method: We performed a cross-over single blinded clinical trial in which subjects were randomly allocated to undergo 5 weekly sessions of myofascial trigger point blocks with 1% lidocaine (BL treatment) or 5 weekly session of physical therapy treatment (PT treatment). Subjects were assessed with Harris Hip Score (HHS) at baseline, week 6 and 12, and with Visual Analogue Scale (VAS) and pressure dolorimetry in every visit.
Results: 17 hips from 15 subjects (8 men, 68.2 ± 4.6 yo) were subjected to treatment. VAS improvement was equivalent in both groups (BL: 0.65 x PT: 0.65; $p = 0.96$), as much as for muscle dolorimetry (BL: 2.48 x PT: 0.76; $p = 0.38$), however myofascial pain blocks resulted in significant improvement in functioning (BL: 7.66 x PT: 1.57; $p = 0.03$).
Discussion and conclusions: Although joint abnormalities are the main feature of HOA, it is not clear which are the sources of pain and disability in such patients. These results demonstrate that the myofascial component is clearly related to decreased functioning in patients with severe clinical pictures and its treatment is efficacious when HR is not available.

OP182
LONG-TERM EFFICACY OF DIFFERENT MOLECULAR WEIGHT HYALURONIC ACID FORMULATIONS IN ROTATOR CUFF TENDINOPATHY

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Background of the study: The rotator cuff syndrome is the most common shoulder pathology. This pathology is a combination of different conditions that includes rotator cuff tendinopathy and rotator cuff tears. Rotator cuff tendinopathy is mostly related to functional overload, although it is emerging a great interest about metabolic and endocrine disorders, especially about thyroid and oestrogen hormones deficiencies, diabetes and hypercholesterolemia. The main symptom is pain, which gradually compromises activities of daily living. The treatment aims to decrease pain and to improve articular function and life quality. There are many possible therapies, which can be rearranged in different ways. NSAIDs and corticosteroid intra-articular injections have several adverse effects, therefore they may not be used as long time solutions. One therapeutic option is represented by intra-articular injections of hyaluronic acid that seems to have both "symptom-modifying" and "disease-modifying" activities. Currently there are many different hyaluronic acid pharmaceutical formulations, which have different features and one of them is molecular weight. Actually it is not already defined which hyaluronic acid is most effective in painful shoulder pathology.
Purpose: To compare the clinical effectiveness of low molecular weight hyaluronic acid (Hyalgan ®, 500-730 kDa) + 0,5 ml of triamcinolone acetonide with medium molecular weight hyaluronic acid (Sinovial ®, 800-1200 kDa) + 0,5 ml of triamcinolone acetonide.
Materials and methods: A total of 55 patients affected by rotator cuff tendinopathy were randomly single-blind assigned in two group of 27 and 28 patients. All the patients included had to meet the criteria for inclusion. Group A, composed of 28 patients, was subjected to a cycle of 3 infiltration of Hyalgan ® (500-730 kDa) with the addiction of 0,5 ml of triamcinolone acetonide. Group B, composed of 27 patients, was subjected to a cycle of 3 infiltration of Sinovial ® (800-1200 kDa) with the addiction of 0,5 ml of triamcinolone acetonide. All the infiltrations were performed by the same experienced operator. The questionnaries were administered by another operator, who didn't know what kind of hyaluronic acid was used. Pain and articular functionality were assesed with DASH and Constant-Murley questionnaries. All the parameters were evaluated before and after infiltrations and after 4, 12, 24, 52 weeks from the last infiltration.
Results: Patients of both groups achieved benefits in terms of pain decrease and functional improving. After 4, 12, 24 and 52 weeks of follow-up from the last injection, both treatments showed the same efficacy.
Conclusions: Both formulations are significantly effective in improve pain and function. There is statistical evidence that low molecular weight hyaluronic acid has the same effects than medium molecular weight hyaluronic acid in the rotator cuff pathology treatment.

OP183
SITTING POSITION AT WORK - A RISK FACTOR FOR BACK PAIN?

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Background and Aim: Management of common back pain (BP) has two principal objectives: to relieve acute pain and to attempt prevention of transition to chronicity. In most industrialized countries, disability and work absence due to occupational BP have risen steadily in recent decades.
Purpose: Was made a pilot and pioneer prospective study which involved working people referred by their family doctor for hospital physiatry consultation for BP complains. The aim was to compare active vs desk based professions and the risk of developing BP.
Methods: Preliminary data was obtained from 70 workers with BP complaints with ages between 23 and 64. A medical interview and physical examination was performed.Qui-square tests were used to find proportions between profession and BP. Relative risk of BP in different professions was calculated, with the respective 95% confidence interval. Data was performed in SPSS 22.
Results: Our sample was composed by 17 men and 53 woman. 17 referred neck pain (NP), 45 low back pain (LBP) and 8, rachialgia. 21 had an active profession and 49, a desk based profession, spending over 6 hours sitting per day. Equal proportions were found in NP between active and non active professions (p=0.666). The relative risk of LBP was 1,75 (95% Confidence Interval 1,52-4,82) among people with desk based professions compared with active workers.
Conclusions: According to this study desk based professions have almost double the risk of developing LBP. These findings revealed that a deeper investigation should be conducted and performed for a better understanding of the impact of desk based profession in muscular pathologic such as back pain.

OP184
RESULTS OF A REHABILITATION PROTOCOL FOLLOWING HIP ARTHROSCOPY FOR FEMOROACETABULAR IMPINGEMENT

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Introduction: Femoroacetabular impingement (FAI) is impingement of the acetabular labrum and articular cartilage between the femur head-neck junction and the acetabulum rim. FAI leads to labral tear and degeneration of adjacent articular cartilage. Impingement can result from a decrease in femoral head-neck offset (cam effect) or an overgrow of bony acetabulum (pincer effect); however the majority of FAI hips show a mixed type of impingement with predominance of the cam type.
Purpose: In our PMR department, we developed a rehabilitation protocol following hip arthroscopy for FAI. The purpose of this study was to analyze the results of the application of this protocol and compare the results with the available literature.
Method: Retrospective study including all patients who underwent hip arthroscopy for FAI in a 2,5 year period (july 2012-december 2014), analyzing the number of patients included in the rehabilitation protocol and the period necessary to recover normal gait without pain in work/sport specific movements.
Results: We included 43 patients with a mean age of 41.5 years old, 55.8% men (n=24) and 44.2% women (n=19). Most of the patients had "non specified FAI" (34.9% n=15), 27.9% (n=12) had "cam impingement"; 18.6% (n=8) had "pincer impingement" and 18.6% had mixed type. 39 performed the protocol, with median time of the rehabilitation program of 2.5 months.
Discussion and conclusions: There are few studies in the literature analyzing the results of a rehabilitation program in hip arthroscopy. In our study we found that "cam impingement" was the most prevalent type of FAI, although, probably, the "non specified FAI" group is composed mainly by mixed type of FAI. According to the literature, it takes approximately 3 months to recover from hip arthroscopy with return to running being possible at the 12th week, which is in accordance with our results.

OP185
COMPARISON OF FUNCTIONAL STATUS AND PATIENT SATISFACTION BETWEEN MINIMALLY INVASIVE ANTERIOR TOTAL HIP ARTHROPLASTY WITH SKIN CREASE "BIKINI" INCISION AND CONVENTIONAL ANTEROLATERAL APPROACH

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Introduction: Minimally invasive anterior total hip arthroplasty (MIATHA) with a skin crease "bikini" incision allows implantation without muscle damage using a short oblique skin incision following the anatomic skin crease of the groin. It allows the surgical scar to remain hidden, but the literature states that there is an increased risk (8-40%) of injury to the lateral femoral cutaneous nerve (LFCN).
Purpose: To compare MIATHA with the conventional anterolateral total hip arthroplasty (THA), in terms of pain, analgesia use, complications, functional recovery, LOS and patient satisfaction.
Methods: THA control group (n=18) and MIATHA group (n=18) were selected after undergoing surgery in the orthopedic department followed by rehabilitation in the Physical Medicine and Rehabilitation Department between March 2013 and September 2015. Patients were interviewed by telephone. The Modified Harris Hip score (mHHS) was used to evaluate patient's functional status. A 5-point Likert scale was used to determine patient satisfaction.
Results: There were no statistically significant differences between the variables studied: the MIATHA group mean age was 60 years (SD 13,2) and THA group was 64 years (SD 11,3); sex distribution (61% males and 39% females in the MIATHA and 67% males and 33% females in the THA sample); mean mHHS 79.2 (MIATHA) and 81.11 (THA); LOS 4,2 days (MIATHA) and 4,7 days (THA). There was 91.67% overall patient satisfaction and equal analgesia use in both groups (44,4% in the first two weeks, 11.1% after). A total of 33% of patients reported complications, 27,78% in the THA group (60% lateral hip numbness; 40% other) and 44,44% in the MIATHA group (62,5% lateral hip numbness; 37,5% other).
Discussion and conclusions: There was an overall high level of patient satisfaction and functional status after surgery in both samples. The MIATHA group presents with an improved scar cosmesis, similar functional status, but presents with an important rate of persistent sensory symptoms.

OP186
SCREENING OF PATIENTS FOR FIRST TIME PROSTHESES AFTER AMPUTATION OF LOWER LIMBS

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Throughout the world, societies are aging, and there are increasing numbers of people with chronic diseases and amputations remain one of the leading reasons for disability in the world. Amputation influences the patient's physical, psychological and social functions, as well as their role in society. Of great importance after the amputation of a lower limb is the selection and adaptation of first prostheses that allow patients to move around, thus achieving rehabilitation goals much more quickly. Patients who have lost limbs have increased demands in terms of learning new skills and successfully using prostheses.
The same time given the increased costs and trend of expanding outpatient rehabilitation increases in Latvia, rehabilitation programmes have problems in ensuring sufficient therapy in relation to prostheses. This means the need for more approachable and innovative approaches – tele- rehabilitation to improve the ability of patients with lower limb amputations to overcome these obstacles.
According to research, approximately 1,000 amputations of lower limbs are conducted in Latvia each year, and an average of 460 lower limb prostheses are manufactured, about 250 for first time. A 2009 study of the rehabilitation of people with lower limb amputations in Latvia found that among 183 patients, only 50% uses their prostheses actively for more than 6 hours a day.
Given the aforementioned situation with amputation results in Latvia, the State Asistivtechnologies Centre (TPC) began additional evaluation of patients in 2012 - those who were sent to receive state-financed prosthesis services after lower limb amputations. There is a special evaluation protocol for such patients, including general evaluation by PT and OT, The Mobility Predictive Scale and evaluation by the PRM doctor and a CPO.
The aim of the study was to evaluate the results of the first year of selecting lower limb amputation patients for primary prostheses. The study included 173 patients with lower limb amputations who were evaluated in 2012 in accordance with whether primary prosthesis should be provided. 138 were men, 35 were women, with an average age of 61.49 years and most patients being above retirement age (65). In most cases, the amputation was needed because of chronic innervation or bloodstream disorders -- arteriosclerosis (43%), diabetes (23%), or traumas (22%). The level of amputation includes 46 cases in which the amputation was below the knee, and 119 cases in which it was above the knee. Time between amputation and evaluation ranged from two weeks to 60 months, an average of 7.43 months. 53 of the patients arrived for evaluation within three months after the amputation, 52 did so between four and six months, and 27 did so a year or later after the amputation. 76 could move with crutches, the other 97 used wheelchairs. The Mobility Predictive Scale evaluation for patients using crutches was comparatively higher than for those who arrived in a wheelchair -- 39.39% had good prosthesis results, while 2.42% had average results. For people in wheelchairs, the numbers were 16.97% and 16.36% respectively. Of the 173 patients who were evaluated, only 109 received a decision about primary prostheses, while in 51 cases the process was delayed for 1-3 months so that the patient could do various things to prepare for the process -- to reduce soft tissue, physiotherapy to reduce contracture, strengthening of physical working abilities, etc. In 12 cases, it was decided that prostheses would not be purposeful. It is also necessary to include self-evaluation of the patient's environment in the evaluation of functionality. Further research is also needed to evaluate tiny motoric approaches toward forecasting the results of prostheses.

Conclusions

1. The additional functioning of amputees is purposeful and should be further developed with additional research and improvements to the protocol and the self-evaluation process
2. Promote cooperation with surgeons for amputation level choice
3. More research is needed on the use of tele-rehabilitation for the rehabilitation of amputation patients.

OP187
COMING TO A HALT: ADDED VALUE OF A USER-ADAPTIVE PROSTHETIC KNEE IN PLANNED GAIT TERMINATION

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Introduction The added value of user-adaptive prosthetic knees, such as the Rheo Knee, predominantly have been studied during level walking. However, the majority of periods of continuous activity of individuals with a lower leg amputation are restricted to one or two minutes in length meaning that a high percentage of ambulatory activities involve gait termination. A user-adaptive prosthetic knee might be beneficial, as it should allow early stance flexion which is the main mechanism by which the lower leg dissipates energy.
Purpose Determine the added value of a user-adaptive prosthetic knee during planned gait termination when compared to non-adaptive prosthetic knees.
Methods Ten participants were measured twice: once with their own non-adaptive prosthetic knee and once with the Rheo Knee. Measurement equipment included a six-camera Vicon system and two force plates. Participants made the final step alternating with their intact or prosthetic leg (resp. leading intact and leading prosthetic leg condition). Primary outcomes: knee kinematics during stance and breaking impulses generated by the prosthetic and intact leg.
Results In both prosthetic knee condition, no prosthetic knee flexion was seen during the stance phase. In addition, no differences in deceleration impulses were found between prosthetic knee conditions. The intact leg was mainly responsible for the absorption of forces. This was most evidently visible in the leading prosthetic leg condition. In this condition the intact produced a significantly higher deceleration impulse when compared to the prosthetic leg in the leading intact leg condition (non-adaptive resp. 27.92 vs 9.22 Ns^{-1}, p=0.008; Rheo 31.41 vs 9.79 Ns^{-1}, p=0.008).
Discussion and conclusions In both the leading intact and the leading prosthetic leg condition, the intact leg is responsible for coming to a halt. There seems to be a limited added value of a user-adaptive prosthetic knee during gait termination.

OP188
INTERIM RESULTS OF THE RAPPER II TRIAL - ROBOT ASSISTED PHYSIOTHERAPY EXERCISES WITH REX POWERED WALKING AID IN PATIENTS WITH SPINAL CORD INJURY

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Introduction Patients with spinal cord injury (SCI) benefit physically and psychologically from standing and walking particularly if they can also exercise in the upright position. The REX powered walking aid allows people with SCI to stand and walk without other aids. REX supports 60% of the user's body weight and is inherently stable throughout any point of its movement so therapists can work with the user on a variety of exercises. Combined with assisted ambulation in a REX, upright function allows wheelchair users to regain some of the independence lost through their SCI.
Purpose RAPPER II assesses the safety and effectiveness of an upper limb and trunk exercise regime for SCI users in the REX device.
Method A prospective, international, multi-centre, open label, single arm, registry study supervised by an Independent Clinical Research Organisation (Clinicaltrials.gov: NCT02417532) in 100 people with SCI. Primary outcomes: Completion of transfer; completion of exercises; serious adverse events (AE). Secondary outcomes: Time of transfer; autonomous control; Timed Up and Go (TUG) Test; completion of satisfaction questionnaire.
Results Interim analysis of the first 20 patients. 19 could transfer (mean time 7 min 19 sec), 10 without help or with one assistant. Eight with two; one needed a hoist. 17 completed the shoulder and trunk exercise program. There were no AEs. 18 completed a TUG Test (mean 5 min 12 sec); 17 with just one helper and all 18 achieved autonomous control of the robot. User feedback showed positive responses for device acceptability.
Discussion and conclusions REX allows standing exercise in patients with SCI to be performed safely. This is unique among powered assisted ambulation devices. Users were able to achieve control of the REX and use it to move quickly and easily and there was a very high overall level of acceptability of the device.

OP189
EFFECT OF A HOSPITAL-BASED REHABILITATION PROGRAM FOR PATIENTS WITH THORACIC OUTLET SYNDROME AFTER INEFFICIENT CITY-BASED PHYSIOTHERAPY

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In thoracic outlet syndromes (TOS), rehabilitation is recognized as the first-line treatment. When physiotherapy fails, one moves usually to surgery, which is a complex treatment with potential complications. After the city-based physiotherapy, and before surgery, we wondered if an intensive, pluridisciplinary, hospital-based rehabilitation program could improve the patients.
Method: This is a monocentric et retrospective study of 63 patients with TOS admitted in our day hospital during 3 weeks (15 sessions) between 2003 and 2014. Data comes from the hospital record files and from phone interviews.
Results: 3 months after our program, 80% of the patients reported an improvement of their symptoms. Patients with venous symptoms or with a high level of arterial stenosis had a lower rate of improvement. Interscalenic location of the stenosis was associated with a better rate of improvement. 41 patients could be contacted by phone. The mean time between the end of the program and the phone interview was 4.5 years (median 3,5 years, extremes 12 years and 1 year). 66% of the patients reported some decline in performances, 25% chose to undergo surgery. Among these 41 patients, 23 were working before the program and kept their position, 7 patients worked before the program and sill worked after a professional retraining, , 4 had to stop their work before the program and worked again, one of them with a therapeutic part-time arrangement, 4 still do not worked, and 3 were recognized disabled.
Conclusions: An intensive multidisciplinary program can improve a large majority of patients with thoracic outlet syndrome, even after a city-based physiotherapy program failed.

OP190
ASSESSMENT OF THE ROCKER SOLE SHOES ON POSTURAL STABILITY IN DIABETIC PATIENTS WITH DISTAL SENSORIMOTOR POLYNEUROPATHY

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Introduction Distal sensorimotor polyneuropathy (DPN) is a leading risk factor of developing ulcer in diabetes mellitus, including increased pressures at the forefoot. The rocker sole shoes reduce the pressures but can induce instability in patients at risk of falling. The aim of this study is to compare the postural stability between normal shoes (NS) and rocker sole shoe (RSS) in diabetic patients with DPN.
Method 13 subjects with type 2 diabetes and DPN were included in this cohort study. The RSS were compared to NS. Motion was analysed during static posture and during gait. All kinematic parameters were recorded using nine-cameras Vicon while the ground reaction forces and moments were recorded by 2 AMTI force platforms. Reflective markers were placed on anatomical landmarks according the plugin gait conventions. The RMS amplitudes were calculated for the COP-COM variables in both anterior/posterior and medial/lateral directions. The secondary outcome measures were the Berg Balance Scale and Dynamic Gait Index as clinical variables and Gait Variability Index calculated from 9 spatio-temporal parameters.
Results 13 subjects were included with a mean age 64.1 +/- 9.9 years, a mean BMI corresponding to obesity (30.8 +/- 5.4 kg.m-2) and a high frequency of complications (microangiopathy and macroangiopathy). There were no significant differences for the COP-COM variable between NS and RSS for the anterior/posterior and medial/lateral directions whatever the OE or CE. ($p=0.37$ for anterior/posterior with EO and $p=0.89$ with EC, $p=0.95$ for medial/lateral directions with EO and $p=0.19$ with EC). There were also no significant difference for the Gait Variability Index, the Berg Balance Scale and the Dynamic Gait Index. ($p>0.05$).
Conclusions The RSS seem not induce postural instability in diabetic subjects with DPN, compared to the NS. For future studies the number of subjects has to be increased to confirm these preliminary results, considering the severity of neuropathy.

OP191
EVALUATION OF THE REEDUCATION PROCEDURE EFFICENCY OF THE FUNCTIONAL BALANCE QUANTIFIED IN MULTIPLE SCLEROSIS

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The research purpose is to evaluate the procedure results of a rehabilitation based on walking, balance training and patient transfers, those evaluation methods are detailed, the results are positive. The writers analyzed 144 patients cases who are suffering from Multiple Sclerosis hospitalized in the rehabilitation center, Pomponiana Olbia in Hyères, Southern France between the 01/01/2013 and the 31/12/2013. 4 Items has been evaluated in this procedure: The walking quantified in meters and minutes, The stairs evaluated in step numbers crossed by the patient, The counting of positions rehearsal changing, The position holding clocked in seconds.The inclusion criteria was simple: EDSS less or equal to 7. On the 144 Cases, 116 could be exploited, we selected 112 cases (EDSS less or equal to 7).

Results: 79% +/- 7,6% improved, 46 % +/- 9,2% doubled there walking zone. 63% +/- 8,9% improved, 25% +/- 8% doubled their performance in the stairs. 82% +/- 7,1% improved, 41% +/- 9,1% doubled their performance in positions changing. 76% +/- 7,9% improved, 46% +/- 9,2% doubled their performance in holding positions timed.

Conclusions: In conclusion, the writers show in here the results of the use of a simple procedure, standardized of walking rehabilitation, balance and changing positions for the patients who are suffering from Multiple Sclerosis. They are proving that the active rehabilitation allows in the majority to improve their performance. The writers introduce a rehabilitation procedure based on the training and the results understanding wich can be also used as evaluation grade.

OP192
EARLY REHABILITATION IN PEOPLE WITH MULTIPLE SCLEROSIS

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Introduction Patients with multiple sclerosis (MS) since the earliest stages experiencing motor and cognitive problems, such as lower motor fluidity, reduced attention spans, memory impairments. The progressive loss of integration ability of the central nervous system resulting in a disconnection damage. First affected are fast systems with high level of integration. 'Dual tasking' often leads to a poorer performance.
Purpose Aim of the study is to verify the value of early rehabilitation in reducing the impact of these symptoms on daily living.
Method We conducted a case-control study including 15 patients with EDSS < 3, divided into three groups: 5 underwent 10 sessions of adapted physical activity (APA); 5 had 10 cognitive-motor training sessions (individual rehabilitation project-IRP), 5 not underwent rehabilitation treatment (Control). Patients had initial and final motor-cognitive assessments using Berg Balance Scale (BBS), Ten Meter Walking Test (TMWT) at different speeds and performing a cognitive task (Word List Generation-WLG), Brief Repeatable Battery of Neuropsychological Tests (BRB-NT), Trail Making Test (TMT) and Digit Span.
Results TMWT final evaluation showed variations in IRP and APA. The number of words generated in usual and quick speed, not changed in Control, was reduced in APA, increased in IRP. BBS score variation was statistically significant in IRP and APA (IRP initial median score: 52, final median score: 55). At BRB-NT, after cognitive training, results a significant improvement in IRP (T-Test: p 0,005).
Discussion IRP and APA show a greater ability in balance control and global fluidity; IRP has better performance in 'dual tasking', probably related to an exercise focused on individual specific impairments.
Conclusions These data support the value of individualized rehabilitation treatment, since the early stage of the disease, moreover APA could represent a good tool in the maintenance phase. Reference**:** Kalron A. Walking while talking-difficulties incurred during the initial stages of multiple sclerosis disease process. Gait Posture, 2010.

OP193
CORRELATION AMONG FATIGUE AND KINEMATIC GAIT PARAMETERS IN MULTIPLE SCLEROSIS.

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Introduction: Gait abnormalities in persons with multiple sclerosis (MS) are well documented. In addition, fatigue is one of the most critical parameters affecting the quality of life of MS patients.
Purpose: The aim of the present study was to investigate the relationship between gait parameters obtained via an inertial-based unit (IMU), and fatigue obtained via the self-rated "fatigue severity scale" (FSS).
Method: Twelve MS patients were recruited. The ability to complete the timed 25feet walk test (T25FW) in 10s or less was among the inclusion criteria. All patients had mild to moderate disability; Kurtzke Expanded Disability Status Scale (EDSS) was not exceeding 4.0. Each participant completed the 9-item FSS questionnaire, then the seconds to ambulate 7.62m at fast velocity (T25FW) were recorded during two consecutive trials, and finally a 10m kinematic analysis, at their preferred walking speed, was performed.
Results: FSS mean score was 4.75. Walking speed was 69.66cm/s, stride length 93.75cm, and cadence 94.19steps/min. The double support percentage was 27.88%. Maximum height was 12.25cm for the left foot and 12.58cm for the right foot.
Discussion and conclusions: Walking was slow due to short stride length and cadence. MS patients, spend a high percentage of the gait cycle in double support, possibly due to minimal posture and balance deficits. Correlation between FSS and gait kinematic parameters, was not significant for all tested variables; i.e. speed (r=0.557, p=0.060), stride length (r=0.441, p=0.151), cadence (r=0.574, p=0.051), double support (r=0.256, p=0.422), maximum left foot height (r=0.291, p=0.360), and maximum right foot height (r=0.654, p=0.021). Gait data were not found to be strongly correlated to FSS rating, implying a non direct relationship between MS ambulation and perceived fatigue. However, a reliable answer to the question whether the motor control mechanisms regulating human locomotion are different from those regulating perceived fatigue, requires further investigation.

OP194
DOES METRONOME REALLY HELP TIMING GAIT IN PARKINSON'S DISEASE?

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Introduction Timing gait disorders of Parkinson's disease (PD) are characterized by unstructured gait variability. Recently, the breakdown of the temporal organization of stride duration variability (i.e. long-range autocorrelations; LRA) was associated to dynamic instability in PD. To improve timing gait in PD, synchronization of walking with rhythmic auditory stimulation (RAS) like music or metronome is largely used in clinical settings.
Purpose To assess the LRA modulation of PD gait pattern according to the structure of RAS.
Method Nine patients performed overground walking trials at a comfortable speed while listening different structures of RAS (counterbalanced order across patients): isochronic, randomly fluctuating, fluctuating according to an LRA structure and no RAS. Each structure was adapted to the patient's gait cadence as previously measured in a 10 meter-walking test. Temporal organization (LRA) of stride duration variability, gait cadence, speed and stride length were measured on 512 consecutive gait cycles. The presence of LRA was based on scaling properties of the series variability (Hurst exponent) and the shape of the power spectral density (á exponent). Those measures were compared across the four conditions using a one-way-repeated ANOVA.
Results Our results show that temporal organization of PD gait may be modulated using different auditory structures. Adequate correlation between LRA of gait and auditory cue indicates strong adaptation and synchronization of the gait to the RAS. However, LRA were systematically lower during auditory conditions compared to spontaneous walking session, up to the disappearance of LRA during isochronic RAS. Furthermore, gait cadence, speed and stride length were not statistically different across different conditions.
Discussion and conclusions Isochronic auditory stimuli (e.g. metronome) do not seem to be an optimal way to improve timing gait in PD, as it induces the disappearance of LRA. Future work will investigate whether structured auditory stimuli induce gait improvement in PD.

OP195
DISCRIMINATION ABILITY OF 12-ITEM GENERAL HEALTH QUESTIONNAIRE (GHQ-12) – ITEM RESPONSE THEORY

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Introduction: Since the 1970's, General Health Questionnaire (GHQ) has been widely used by both clinicians and researchers for detecting psychiatric disorders in the general population. It has also been a common test used across the rehabilitation field. However, it is not known if GHQ-12 is sensitive across the entire spectrum of trait levels. In other words, it is not known if it is evenly sensitive in distinguishing people with anxiety and depression at the lower and the upper ends of the scale.
Purpose: To assess how well 12-item General Health Questionnaire (GHQ-12) discriminates respondents with the different levels of latent trait.
Methods: Survey among public sector employees. Exploratory factor analysis, two-parameter model according to item response theory. The Mantel–Haenszel chi^2 test and common odds ratios to determine whether an item favors one gender group relative to the other.
Results: Among 53 133 respondents, the total GHQ-12 score was on average 2.0 (SD 3.0) points. Exploratory factor analysis recognized only one factor with eigenvalue >1.0. The discrimination estimates were good for each of GHQ-12 items varying from 2.0 to 3.9. The level of latent trait had to be higher than average to achieve the 0.5 probability of the trait appearing in responses. There were some gender-related differences in items 3, 5, 7, 8, ad 12 (p-values <0.01 or less).
Discussion and conclusions: GHQ-12 seems to be more suitable for populations at the elevated rather than for that at the middle or lower ends of the level of anxiety and depression.

OP196
ACTIVLIM: A ROBUST MEASUREMENT TOOL FOR CLINICALLY MEANINGFUL FOLLOW-UP OF ACTIVITY LIMITATIONS IN PATIENTS WITH NEUROMUSCULAR DISEASES

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Introduction: Questionnaire-based instruments have demonstrated their usefulness in various clinical assessments and in health care policy planning. Questionnaires such as ACTIVLIM are more and more incorporated in clinical practice in many fields. ACTIVLIM is a Rasch-built questionnaire that measures activity limitations in patients with neuromuscular diseases.
Purpose: This study aims to investigate the clinimetric properties of ACTIVLIM, as used in daily practice in a large nationwide representative cohort of patients with neuromuscular diseases.
Method: A cohort of 2986 patients was assessed at least once over 2 years in 6 national neuromuscular diseases reference centers. Successive Rasch analyses were conducted in order to investigate the scale's validity, reliability, consistency across demographic and clinical sub-groups and sensitivity to change.
Results: Analyses confirmed that ACTIVLIM is a unidimensional scale, with very accurate item calibrations. It showed a good reliability (R=0.95), an appropriate targeting for 87% of the sample and a good consistency across age, gender, language and time. Despite some variations in the item difficulty hierarchy across diagnoses, ACTIVLIM exhibited a good capability to quantify small but significant ($p<0.001$) and clinically meaningful, changes in activity for various diagnostic groups.
Discussion and conclusions: Overall, ACTIVLIM demonstrated very good clinimetric properties, allowing accurate quantitative measurement of activity limitations in in both children and adults with neuromuscular diseases.

OP197
MEASUREMENT PROPERTIES OF THE WHODAS 2.0 USED IN SPECIALIZED REHABILITATION SERVICES IN NORWAY

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Introduction: The WHO Disability Assessment Schedule (WHODAS 2.0) is a generic instrument to assess disability based on the International classification of Functioning, Disability and Health (ICF). Measurement properties of the instrument have been tested in several studies. Though WHODAS 2.0 has been translated and used in Norway, its measurement properties have not been explored.
Purpose: To investigate the following measurement properties of WHODAS 2.0 in rehabilitation settings including patients with various diagnoses; reliability, construct validity, responsiveness and fit of measurement model.
Method: Test of measurement properties followed the COSMIN consensus agreement. A total of 985 patients completed both WHODAS 2.0 and the Medical Outcomes Study 36-item Short Form (SF-36). 54 patients completed the questionnaires twice, without any reported change in health status to evaluate reproducibility. 104 patients completed the questionnaire before and after rehabilitation to evaluate responsiveness. Reproducibility was investigated by intraclass-correlation coefficients (ICC) and internal consistency was assessed (Cronbach's alpha). Construct validity was evaluated by testing a priori formulated hypotheses about correlation between domains of WHODAS 2.0 and domains of SF-36.
Results: Preliminary results show ICC from 0.56 to 0.84 for the WHODAS domains, and 0.87 for total score. Cronbach's alpha for domains range from 0.75 to 0.94, and 0.81 for total. For construct validity 7 of 12 hypotheses were confirmed. A seven model structure of WHODAS 2.0 almost reached the criteria set for a good fit of the model with confirmatory factor analysis (Comparative Fit Index: 0.913, Tucker-Lewis Index = 0.904, Root Mean Square Error of Approximation: 0.057). Results of responsiveness will be presented at the congress.
Discussion and conclusions: The Norwegian version of WHODAS 2.0 show moderate to satisfactory reliability and moderate validity in rehabilitation patients. The original model is recommended retained.

OP198
QUALITY OF LIFE ASSESSMENTS IN SCHIZOPHRENIA - DEVELOPMENT OF A SHORT VERSION OF THE QLIS

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Quality of life comprises important outcome domains in rehabilitation of persons with schizophrenia. The QLiS (Quality of Life in Schizophrenia) is a disease-specific questionnaire with high content validity and sound psychometric properties. It comprises 54 items related to 12 subscales. However, its use in surveys or clinical studies is limited due to its length. Our aim was to develop and validate a short form of the QLiS. Four steps were taken to develop the short form (QLiS-SF) using samples from the Clinical Analysis of the Treatment of Schizophrenia study. 1. A model with second order scales was developed using exploratory factor analysis. 2. The resulting model was tested in an independent sample using confirmative factor analysis (CFA). 3. Based on this model items were selected on grounds of distributional properties, content reviews, and item loadings. 4. The resulting short form was validated independently through CFA.
Results: Three second order scales were constructed: illness-related quality of life, social life, and global subjective well-being. CFA of the new theoretical model resulted in a CFI of 0.67 and absolute fit indices of CMIN/df=2.55, RMSEA=0.08, SRMR=0.09. We selected 13 items that showed good statistical properties and good fit of content to subscale. Fit of the underlying theoretical model with the 13 items was satisfactory (CFI=0.95, CMIN/df=2.23, RMSEA=0.06, SRMR=0.04). Composite reliability scores for the three subscales were above 0.70. The QLiS-SF showed adequate model fit and reliability. It offers a novel, well-founded opportunity to assess quality of life in persons with schizophrenia in situations in which the application of the long version is not considered possible.

OP199
THE BETTER ONE: MODIFIED TARDIEU SCALE OR MODIFIED ASHWORTH SCALE, IN ASSESSING THE RESPONSIVENESS OF CHILDREN WITH SPASTIC CEREBRAL PALSY TO BOTULINUM TOXIN TYPE A TREATMENT? A RANDOMIZED TRIAL.

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Introduction This study is a randomized controlled trial to compare the responsiveness of MTS and MAS.
Purpose To compare the responsiveness of all components of modified Tardieu scale and modified Ashworth scale after botulinum toxin type A intervention in children with spastic cerebral palsy.
Method Thirty children with spastic cerebral palsy are randomly assigned to botulinum toxin intervention and physiotherapy group (Group P-B) and physiotherapy group (Group P). One day before and two weeks after botulinum toxin intervention, modified Tardieu scale and modified Ashworth scale are applied to test the spasticity of ankle plantar and elbow flexors. The responsiveness as measured with the two scales is compared with Standardized Response Mean (SRM=average change in Group P-B/SD of change scores in Group P-B) and Guyatt's responsiveness index (GRI= average change in Group P-B/ SD of change in Group P).
Results When measuring the spasticity of ankle plantar flexors, both modified Tardieu scale (SRM=0.86~7.21, GRI=0.56~4.93) and modified Ashworth scale (SRM=1.11~1.26, GRI=1.52~1.84) showed large responsiveness. When elbow flexors spasticity is assessed, the spasticity angle Y, the fast stretch angle R1 of modified Tardieu scale (SRM=7.21, GRI=7.59~9.8) and modified Ashworth scale (SRM=1.09, GRI=1.59) showed large responsiveness, while the spasticity grade X, the slow stretch angle R2 of modified Tardieu scale showed the small responsiveness (SRM and GRI unavailable).
Discussion and conclusions Both modified Tardieu scale and modified Ashworth scale showed large responsiveness in assessing the spasticity of children with spastic cerebral palsy to botulinum toxin treatment. In particular, the fast stretch angle R1 of modified Tardieu scale might be the best component for accessing the spasticity reduction, as it showed the highest value.

OP200
THE A-TEST – ASSESSMENT OF FUNCTIONAL RECOVERY DURING EARLY REHABILITATION OF PATIENTS IN THE ORTHOPEDIC WARD – DIAGNOSTIC TEST ACCURACY

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Introduction: A-test was designed for assessment of functional recovery during early rehabilitation of patients in the orthopedic ward. This performance based test consists from 10 items for assessing basic activities by six level ordinal scale (0-5). Total scores can range from 0 to 50, or inability to perform any activity despite the help of therapists until complete independence and safety in performing all activities.
Purpose: The aim of this study was to determine the accuracy of A-test and cutoff point at which A-test has ability to separate patients with and without functional disability during and at the end of early rehabilitation.
Method: Measurement-focused study. Setting: orthopedic ward, 1st-5th day of early inpatient rehabilitation. Population: 60 patients with hip osteoarthritis that underwent arthroplasty and 60 surgically treated patients with hip fracture. Measures: A-test and The University of Iowa Level of Assistance Scale as the "gold standard". Statistical analysis: ROC curve and area under the curve (AUC), point to the ROC curve closest to (0.1), Youden index.
Results: AUC: 0.825 (0.744-0.905) for the first rehabilitation day (RD), 0.922 (0.872-0.972) for the second RD, 0.980 (0.959-1.000) for the third RD, 0.989 (0.973-1.004) for the fourth RD, and 0.999 (0.996 -1.001) for the fifth RD. The optimal cutoff for the results of A-test: 7/8 for the first RD, 29/30 for the fourth RD, and 34/35 for the fifth RD. On the second and third day A-test has two cutoff points, the lower point safely separates the patients with functional disability, while upper point rules out functional disability (for the 2nd RD: 12/13 and 17/18, for the 3rd RD: 13/14 and 18/19).
Discussion and conclusions: The A-test is accurate test capable to separate patients with and without functional disability during early rehabilitation on the orthopedic ward.

OP201
INPATIENT REHABILITATIVE SPA CENTRE IN OLDER ADULT AFTER TOTAL HIP ARTHROPLASTY: A 3 MONTHS FOLLOW UP STUDY

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Introduction: After discharge from acute hospital after primary hip replacement surgery the patients can choose to different treatment destination and modalities: intensive inpatient rehabilitation (IR) or ambulatory treatment at home. Nowadays, the modern rehabilitative SPA centres (R-Spa) can also offer a suitable setting for rehabilitation interventions.
Purpose: The purpose of this observational prospective two-center study was to compare in patients with hip arthroplasty two postoperative management strategies: IR and R-Spa. We test 1) the feasibility of rehabilitation treatment in R-Spa centre; 2) whether balneo-kinesitherapy in combination with land-based therapy performed in thermal environment improves patient outcomes after hip arthroplasty compared with land-based therapy alone performed in intensive inpatient rehabilitation hospital ward; 3) the degree of satisfaction of the patients
Method: Functional mobility tests, muscle strength, pain, changes in health state by Harris Hip Score (HHS), and the health-related quality of life with Short-Form 12 of 50 patients (30 male and 20 female, mean age 74.8+/- 10.9) were analysed before to start rehabilitation and at a 3 months follow up study. The Length of stay in orthopaedic surgeon was mean was 7.8 days +/- 3.9.
Results: Patients admitted to IR had the highest functional disability and mean age before arthroplasty, but no significantly. After a rehabilitation intervention of average 15 days +/- 3.9.after surgery, the two setting shows results similar at 3 month-follow up program on pain, disability, hip function and HHS. The quality of life by SF-12 and the degree of satisfaction are significantly better in the MR-Spa group.
Discussion and conclusions: A rehabilitation program in elderly patients after primary hip replacement surgery performed in MR-Spa centre is feasible and may have gains in relieve pain, motor-functional capacity and health state similar to IR, but in MR-Spa the patients show better impact in quality of life.

OP202
REHABILITATION IN PHLEBOLYMPHATIC DISEASES: A COMPARISON BETWEEN MECHANICAL AND MANUAL THERAPY

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Introduction The WHO recognizes approximately 250 to 400 million people suffering from lymphedema in the world. The phlebolymphatic disease simultaneously affects the lymphatic and venous system, mainly due to the alteration of microcirculation for several factors (genetic component, environmental factors).
Aim Goal of our study was to compare two different gold standard therapeutic approaches: manual lymphatic drainage and the Endospheres mechanical therapy.
Methods We enrolled 40 female patients. They were randomized in two groups and subjected to: physical and rehabilitative assessment, evaluation of weight and circumference and bioimpedance analysis at T0, T1, T2.
Results At T1 the extracellular water (ECW) became closer to the ideal value after Endospheres therapy, decreasing significantly, whereas in patients treated with the manual method, with a perception mode, providing a less important impact on the system but with higher long-term effects were demonstrated lasting results in the las follow-up. It's to note that the follow-up showed positive results even in patients treated with Endospheres. A gradual reduction of the circumference of the limb using the manual method, has been achieved, especially on the leg. While in patients treated with Endospheres, there was an increase in the first evaluation, especially on the thigh. The increase in tissue circumference, obtained after a process of toning is the first sign of the tissue vascularization and reactivation. At T2 we found a greater reduction of all the circumferences in Endospheres group.
Discussion and conclusions The state of the art in rehabilitation of phlebolymphatic disease highlights the need for an adaptation of treatments to the specific pathological conditions. Results show the efficacy of both treatments with higher significance after endospheres therapy. This is in line with the evidence of the need for a global and systemic, therapeutic approach in order to reduce exacerbations, pain and maintain wellbeing.

OP204
KNOWLEDGE EVALUATION OF PATIENTS WITH BACLOFEN PUMP AND THEIR CAREGIVERS

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Introduction: Intrathecal baclofen or intra-ventricular baclofen therapy is a potentially hazardous therapeutic in the treatment of neurological spasticity.
Purpose: To evaluate the knowledge of patients with this device and their caregivers.
Methods: This prospective study was conducted at two centers of physical medicine between January 2014 and June 2015. All patients and their caregivers, who have given their consent, were included. A knowledge assessment questionnaire was previously created and checked by three medical experts and six patients-test. It included 20 questions divided into four themes : alarms, adverse effects, daily life and what to do in case of additional tests. Each response can be true, false or “I don't know". It was associated with a degree of certainty according to a Likert 7-point scale. Every correct answer was scored, through the Likert scale, of +1 to +7 (7 being the highest degree of certainty), any incorrect answer was rated from -1 to -7; zero indicates “I don’t know".
Results: 37 patients and 110 caregivers were included. The median of "alarms" theme is +6 for patients and +5 for caregivers. For the theme of "side effects", it is 0 for patients and +1 for caregivers. The median theme of "everyday life" is +1 for patients and caregivers; it is +2 for patients and +1 for caregivers, in the last theme.
Discussion: There is a certain lack of knowledge of patients and caregivers about side effects or other potentially life-threatening situations. The information method should be reviewed on these specific points.

OP205
CLINICAL AND ULTRASONOGRAPHIC ASSESSMENT OF EXTRACORPOREAL SHOCK WAVE THERAPY: EFFECTS IN PLANTAR FASCIITIS

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Introduction: Plantar fasciitis is a common sport and professional overuse injury. Extracorporeal shock wave therapy (ESWT) is one of the most used treatment methods for this condition.
Purpose: The purpose of this study was to evaluate the effects of ESWT on the clinical and ultrasonographic aspects of the proximal plantar fasciitis.
Method: Twenty-five patients with unilateral chronic plantar fasciitis were enrolled in the study. 4 sessions of ESWT (2000 shocks/session, 2.5 bar pressure, 10 Hz frequency) were performed at 4-day intervals. Assessment was done at baseline and at 1 and 6 months after the beginning of the treatment, by visual analogue scale for pain and by ultrasonographic examination for measurement of the thickness of plantar fascia at 2 cm distal to the medial calcaneal tuberosity. Contralateral plantar fascia was used as control.
Results: At baseline, plantar fascia was significantly ($p<0.05$) thicker on the painful side (5.4±1.1mm) than on the control side (4.1±1.2mm). At 1 and at 6 months after ESWT there was no significant difference between sides. The decrease in plantar fascia thickness was significant ($p<0.05$) from baseline (5.4±1.1mm) to 6 months after ESWT (4.2±1.0mm). Pain, evaluated in different circumstances (at rest, during the activities of daily living, during one-leg stance), decreased significantly ($p<0.05$) from baseline to 1 month after ESWT and this significance was still maintained at 6 months after ESWT.
Discussion and conclusions: In patients with plantar fasciitis, ESWT was efficient in diminishing pain, but also in decreasing the thickness of previously enlarged plantar fascia, with persistent effects up to 6 months.

OP206
ISOMETRIC QUADRICEPS EXERCISES ARE EFFECTIVE ON PAIN, STIFFNESS AND PHYSICAL FUNCTIONING IN PATIENTS WITH KNEE OSTEOARTHRITIS: A RANDOMIZED CONTROLLED TRIAL COMPARING KNEE JOINT POSITION FLEXION VERSUS EXTENSION

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Introduction There is evidence to suggest that isometric quadriceps exercise (IQE) program has beneficial effects on quadriceps muscle strength, pain, and functional status in patients with knee osteoarthritis (OA). Position of the hip and knee joint may affect the outcome of IQE program.
Purpose: To compare the effects of IQE performed while the hip and knee joint was either in flexion or extension on pain, stiffness and physical functioning of patients with knee OA.
Method: In this RCT 30 patients with knee OA were allocated to an experimental (n=15) or a control group (n=15). Both groups received conventional physiotherapy program including 24 sessions of hot pack (30 min), ultrasound (5 min) and TENS (30 min) to knee joint. Control group performed IQE (50 repetitions, 20 seconds on, 10 seconds off) while the patient was in supine and hip and knee joints were in extension (with a rolled up towel beneath the knee), whereas the experimental group performed same exercises while the patient was sitting with flexed hip and knee joints. Main outcome measures were pain, stiffness and physical functioning subscales of WOMAC.
Results: Both groups were similar in terms of baseline clinical characteristics. Pain, stiffness and physical functioning levels improved significantly in both groups ($p<0.05$). Between-group difference of mean change score was not significant for the pain (3.7 vs 3.5) and physical functioning score (13.3 vs 11.6). However, stiffness score improved more in the experimental group than the control group (1.6 vs 0.9) ($p<0.05$).
Discussion and conclusions: In our group of patients with knee OA, IQE both in flexion and extension in addition to a physiotherapy program were beneficial in terms of pain, stiffness and physical functioning level. Exercises while the hip and knee joints were in flexion were more effective on stiffness level.

OP207
DEPRESSIVE SYMPTOMS AND GENDER DISPARITIES IN EXCLUSION FROM EMPLOYMENT

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Introduction: Women have a higher prevalence of depression and suffer from greater disease severity than men, but gender differences in the impact of depression on the exclusion from employment have not been sufficiently analysed.
Purpose: The aim of this study was to assess the gender-specific risks of early retirement and unemployment among the employees of downsized organisations in relation to their earlier depressive symptoms.
Method: Analysis included 884 men and 828 women who responded to the nationally representative Swedish Longitudinal Occupational Survey of Health in 2008 and 2010. All respondents reported in 2010 the exposure to downsizing resulting in job loss, early retirement or remaining employed (reference outcome). The latter group remained employed in downsized organisations or found a new job before becoming unemployed. Earlier depressive symptoms were assessed in 2008 with a brief depression subscale from the Symptom Checklist 90 and categorised by severity levels. Associations were measured using multinomial logistic regression models adjusted for demographic factors (age, education, marital status), permanence of employment, past redundancies, long-term sickness and scale of downsizing.
Results: While men with pre-existing major depression tend to retire earlier (RRR=14, $p>0.05$), women had increased risks of job loss (RRR=2.3, $p<0.05$). Job loss in men was not significantly influenced by their health.
Discussion and conclusions: Gender disparities in exclusion from employment should be considered by rehabilitation researchers, clinicians and providers of vocational rehabilitation services. Policies preventing social exclusion are important for workers with risks of major depression.

OP208
THE EFFECTIVENESS OF ROCKER SHOES ON ROCKER FUNCTION IN POST-STROKE HEMIPLEGIC PATIENTS WALKING WITH ANKLE FOOT ORTHOSIS

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Introduction: All three rockers are disturbed in hemiplegic gait. Previous research has shown that although Ankle Foot Orthosis (AFO) could potentially improve first (heel) rocker during stance phase of gait, it doesn't influence third (forefoot) rocker.
Purpose: The aim of this study was to evaluate the effect of rocker shoes on third rocker in chronic hemiplegic patients using solid AFO.
Method: 21 chronic post-stroke hemiplegic patients (men and women) aged between 45 to 70 participated in this study. They were examined in three conditions including AFO only, AFO + standard shoes (SS) and AFO + rocker shoes (RS) in random sequences. To evaluate foot rocker function, force and pressure data were collected by a pedobarography system. Outcome measure included mean force (N) and impulse (Ns) in hind foot and forefoot and toe box during initial double support (IDS) and terminal double support (TSD), and single support (SLS) time.
Results: According to the obtained data, there were no significant differences among three conditions with regard to mean force and impulse in IDS ($P>0.05$). Also, during TDS , RS resulted in significantly more mean force and impulse compared to SS and AFO only condition ($P<0.05$). Plus, no significant differences were seen among three conditions regarding SSL time (P.0.05).
Discussion and conclusions: The results of the present study indicated that using RS along with AFO could improve forefoot rocker and therefore, push-off during stance phase of hemiplegic gait compared to utilizing SS. It seems that this improvement has been achieved through adding rocker modification to the shoes which potentially could improve progression of the body weight and transfer of the plantar forces.

OP209
UPPER LIMB DEXTERITY AND STRENGTH: CAN WE USE THEM AS PREDICTORS OF SELF-CARE INDEPENDENCE IN STROKE SURVIVORS

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Purpose: The aim of this study was to evaluate how results in upper limb function and strength tests correlate with improved self-care capacity at discharge, in an inpatient rehabilitation program for stroke survivors.
Method: Subjects were 119 stroke survivors in their first inpatient rehabilitation period in the year 2014, treated in an adult neuro-rehabilitation service. Data were prospectively collected in a custom designed instrument at the beginning and end of the rehabilitation program and were retrospectively analyzed. Upper limb function was measured with 9-hole peg test (9HPT) and strength with Biometrics Dynamometer (BMTS). Functionality at admission and discharge was measured by total and self-care subset scores of the Functional Independence Measurement (FIM). Outcomes were analyzed with the null hypothesis t-test for popular proportion.
Results: In our 119 cohort of stroke patients, the most frequent etiology was ischemic (72.3%). The right hemisphere was affected in 46.2%, the left in 39.5% and in 13.5% the lesion was sub-hemispheric. The most prevalent impairment observed was left hemiparesis (48.74%). There was a high correlation (87%) between the total FIM score at admission and FIM scores of the self-care subset at discharge. There was no significant correlation between 9HPT (left arm or right arm) performance and self-care scores at discharge. Correlation between Biometrics' results and the self-care score of FIM for the left upper limb was 32% and 8% for right upper limb.
Discussion: This study supports the hypothesis that there is a positive correlation between total FIM and upper limb strength, as measured with Biometrics Dynamometry at admission and an improved result in the self-care subset scores of FIM at discharge. In this cohort we could not demonstrate a correlation between upper limb function at admission, measured by 9-HPT, and an improved result in the scores of the self-care subset of FIM at discharge.

OP210
EFFECTS OF PROPRIOCEPTIVE BASED TRAINING IN STROKE RECOVERY

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Introduction The recovery process occurs through neural mechanisms mediating spontaneous cortical reorganization, but evidence indicates that rehabilitation is essential to improve motor recovery either. In the present study authors hypothesized that the simultaneous stimulation of both afferent and efferent pathways could be essential to foster voluntary muscle contraction in post-stroke patients with upper limb hemiplegia.
Purpose To evaluate the effect of PBT for fast recovery of voluntary muscle contraction in the sub-acute phase after stroke.
Method Patients affected by stroke within 6 months before enrolment and with complete paresis were randomized in two groups: PBT or CT. Both treatments lasted: 1h/day, 5-days/week, 3-weeks. The assessment comprised the Medical Research Council scale (MRC), Dynamometer, Fugl-Meyer upper extremity scale (F-M UE), modified Ashworth and Functional Independence Measure scale (FIM), administered before and after the treatment. Biceps brachii, triceps brachii, carpi flexors, carpi extensors, digitorum flexors and digitorum extensors were taken into consideration. The PBT consisted of multidirectional exercises executed synchronously with unaffected limb and verbal feedback. In the CT group patients were treated in accordance with the post-stroke guidelines.
Results Twenty patients with mean time of 3,7±2.1 months since stroke (12 ischemic and 8 hemorrhagic; 11 female and 9 male) were enrolled in the study and randomized to PBT (n=14) and CT (n=6) group. Statistically significant improvement was observed within PBT group (MRC overall p=.001, Dynamometer overall p=.001; F-M UE p=.009; FIM p=.007), and within CT group (MRC overall p=.039; Ashworth p=.038). The comparison between groups showed significant difference for MRC overall (p=.001) and Dynamometer overall (p=.001)
Discussion The findings of this study revealed that PBT may be a feasible intervention to improve motricity of upper limb in stroke survivors and can provide a background for future complex rehabilitation.
Conclusions Results of this study showed that PBT may induce a recovery of voluntary muscle contraction in the sub-acute phase after stroke.

OP211
THE LONG-TERM EFFECT OF EARLY VERSUS DELAYED APPLIED CONSTRAINT-INDUCED MOVEMENT THERAPY ON ARM-USE IN STROKE PATIENTS.

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Introduction – Many patients with stroke show reduced use of the affected arm. Constraint-induced movement therapy (CIMT) is a method which aims to increase the use of the affected arm in activities of daily living. CIMT has shown promising results compared to standard treatment, however, the optimal time to commence therapy still need to be investigated.
Purpose – To compare if early (7-28 days post stroke) or delayed applied CIMT (6 months) leads to more arm use outside the therapy setting.
Method – In this multisite trial 47 patients were randomized into either early or delayed CIMT intervention. Both groups received 3 hours daily CIMT over 10 consecutive working days. To assess arm activity outside the treatment setting, the patients wore uniaxial accelerometers (ActiGraph) on each arm for 24 hours. The Arm use ratio (AuR) of the duration of movement between the more affected arm and the less affected arm was measured 5 times (at baseline, after the early intervention group received CIMT, after 6 months, after the delayed CIMT group received CIMT and after 12 months).
Results – At baseline 44 accelerometer recordings were available, 22 in each group; at 12 month follow-up 14 recordings were available in the early and 13 in the delayed group. At 12 month follow-up the average AuR was 0.85 (SD 0.16) in the early and 0.82 (SD 0.12) in the delayed CIMT group. No significant differences were found between the groups.
Discussion and conclusions – The early and the delayed CIMT group showed the same amount of arm use outside the therapy setting one year after onset of stroke. These results indicate that commencing therapy early is equal good as delayed intervention. The small sample size limits the generalization of the results.

OP212
GLOBAL MEANING AND REHABILITATION IN PEOPLE WITH STROKE

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Introduction – Global meaning refers to global beliefs and global goals guiding people in living their lives. It comprises five aspects: relationships, core values, worldview, identity and inner posture. Global meaning has been hypothesized to guide the process of adaptation to a traumatic event, such as a stroke. Knowledge on the role of global meaning in the adaptation to stroke is limited.
Purpose – The purpose of this study was to explore whether global meaning affects the process and outcome of rehabilitation, as experienced by people with stroke.
Method – In depth semi structured interviews were conducted with 16 people with stroke. Interviews were analysed using qualitative research methods: structural and provisional coding.
Results – Aspects of global meaning (especially relationships, identity and inner posture) were found to affect elements of the process and outcome of rehabilitation. Respondents reported about the following elements of the process and outcome of rehabilitation: motivation, handling stress and emotions, physical functioning and acceptance. The influence was mostly positive. In the interaction with rehabilitation professionals aspects of global meaning played an important role and sometimes lead to conflicts.
Discussion and conclusions – Aspects of global meaning were found to affect process and outcome of rehabilitation in people with stroke. In literature on spirituality and stroke, no relation was found between physical outcomes and spirituality. However, social support was associated with improvement of functional status. Spirituality can be seen as part of the 'worldview'-aspect of global meaning and social support is related to 'relationships'. Therefore, our finding that e.g. worldview is of less influence than e.g. relationships, appears to correspond with the abovementioned studies. More research is recommended to explore this.The influence of global meaning on rehabilitation was mostly positive. Global meaning appeared to be an important factor in how respondents experienced the interaction with rehabilitation professionals.

OP213
EXPERIENCE IN THE USE OF TRANSCRANIAL MAGNETIC STIMULATION IN THE REDUCTION OF SPEECH DISORDERS IN PATIENTS WITH POST-STROKE APHASIA.

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Introduction Neuroplasticity is the ability of CNS to make functional and microstructural changes in order to adapt to new environmental conditions. It is acquired through excitatory and inhibitory modulation of cell-interactions, and the special role is given to the functioning of NMDA-receptors. TMS allows to influence the cell membrane potential by modulating hyper- or depolarizing shifts (depending on the protocol used), while dopaminergic drugs may influence the NDMA-modulated neuroplasticity.
Purpose To study the effect of TMS on neuroplasticity in patients with post-stroke aphasia.
Method The study included 13 patients with right-handedness (M: F = 7: 6) with similar structural ischemic lesions in the left hemisphere and post-stroke aphasia (disorder limitation was 1.8 ±0.6 months, the average age was 49 ±8.7 years). Five patients had an atherothrombotic type, six patients had a cardioembolic type and two patients with an unknown ethiology, according to TOAST. All patients were initially examined by a speech therapist in order to clarify the type of aphasia. Three groups were formed. While all patients received speech therapy classes, one group also used levodopa and another received TMS on Broca area and Wernicke area (15 sessions). Before the TMS all patients were examined with 40-minute routine EEG, no paroxysmal activity was detected.
Results The improvement of speech was evaluated by The Boston Diagnostic Aphasia Examanation scale. The improvement has been achieved in each patient group. Most prominent results were obtained in patients receiving speech therapy and TMS (16% improvement compared with the original results), less clear results were achieved in those receiving speech therapy and levodopa (10%), and far less pronouncing results were obtained in patients treated by speech therapy only (8%).
Discussion and conclusions The results may indicate the efficacy of TMS as a rehabilitation tool in the reduction of the speech disorders in post-stroke patients.

OP214
THE INFLUENCE OF NON- IMMERSIVE VIRTUAL REALITY SYSTEMS IN PATIENTS AFTER STROKE

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Introduction: Recent data have demonstrated the effectiveness of virtual reality (VR) in patients after ischemic stroke. The therapy involves the use of special computer programs designed to simulate actual activities of daily living. Virtual Reality may have some advantages over traditional treatment approaches as they may give patients the opportunity to practice everyday activities that can not be exercised within the environment of a rehabilitation center.
Purpose: To investigate the effect of non-immersive Virtual Reality systems in patients after stroke.
Material: 24 post stroke patients (17 males-7 females; age 61.4 ± 6.8 years). All the participants were in post acute phase. Prerequisite for inclusion in the study were the lack of visual and cognitive deficits and presence of subtle movement in all four limbs. Patients were assessed through FIM scale, Berg Balance Scale and Independent Living Scale.
Method: All patients followed a specially designed VR program for eight weeks. A Kinect sensor was used combined with a display connected to a computer.
Results: All patients showed improvement in functionality, balance and in the independence index ($p < 0.0.1$) thereby improving their abilities in activities of daily living.
Conclusions: Non-immersive Virtual Reality systems seems to be effective and provide better clinical outcome. Their use should be established in rehabilitation centers as they are low cost equipment.

OP215
SHOULDER PAIN IN HEMIPLEGIC STROKE PATIENTS: INCIDENCE, RISK FACTORS AND REHABILITATION OUTCOMES

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Introduction: Shoulder pain is a common problem in stroke rehabilitation. The literature data report that shoulder pain occurs in 16 to 84% of hemiplegic patients.
Purpose: To analyze the incidence of shoulder pain in stroke patients and the risk factors associated with development of shoulder pain. We also aimed to evaluate the effect of rehabilitation programs on motor function and daily living activities in patients with and without hemiplegic shoulder pain and to compare their outcomes.
Methods: Patients in the initial 6-month period after stroke who went through inhospital rehabilitation treatment were included in the study. Demographic and clinical features and medical data of the patients were recorded. Upper extremity Fugl-Meyer Motor Assessment (FMA), Frenchay Arm Test (FAT), and Barthel Index (BI) were applied to the patients on admission, at discharge, and after 3 months of follow-up. For statistical analysis we used statistical program IBM SPSS Statistics 22.0. Results were presented using standard statistical measures of central tendency and range of results. To determine the difference between variables Chi-square analyses and t-test for independent samples were used.
Results: At the initial evaluation 68 (48%) patients had shoulder pain, at discharge 34 (24%) had decreased shoulder pain and at 3 months of follow-up 28 (19.7%) had shoulder pain of decreased or persistent intensity. Early beginning of rehabilitation treatment, functional electric stimulation (FES) and immobilization were shown to be effective treatments for shoulder pain. The major risk factors were poor initial motor function and delayed rehabilitation. In both groups, the FMA, FAT, and BI scores showed significant improvement. This improvement did not differ between the 2 groups.
Discussion and conclusions: Delayed rehabilitation and poor initial arm motor function are most important risk factors for the development of shoulder pain. Early rehabilitation program is beneficial for both motor function and daily living activities.

OP216
LONG-TERM EFFECTS OF PROVIDING ANKLE-FOOT ORTHOSES AT TWO DIFFERENT MOMENTS IN THE REHABILITATION OF (SUB)ACUTE STROKE: A RANDOMIZED CONTROLLED TRIAL

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Introduction Ankle-foot orthoses (AFOs) are often prescribed during rehabilitation after stroke to provide mediolateral stability in stance, facilitate toe-clearance in swing and promote heelstrike. Despite the frequent application, there seems to be a gap between literature studying AFOs and the daily clinical use of AFOs. For example, scientific evidence about long-term effects of AFOs after stroke is lacking and no information with respect to the timing of AFO-provision post-stroke is available.
Purpose Determine the long-term functional effects of providing AFOs at two different moments in the rehabilitation post-stroke.
Method Unilateral stroke patients with hemiparesis, maximal 6 weeks post-stroke and with AFO-indication were included in this randomized controlled trial. Subjects were measured every other week for 18 weeks, with follow-up at week 26. Two groups with different randomized moments of AFO-provision were compared: "early" (AFO-provision at inclusion) and "late" (start rehabilitation without AFO-use for 8 weeks and AFO-provision in studyweek 9). Outcome measures: Berg Balance Scale (BBS), Functional Ambulation Categories (FAC), 6-min walking-test (6MWT), 10-m walking-test, Barthel Index and Rivermead Mobility Index. Generalized Estimating Equation-analysis was used to compare results over time.
Results Thirty-three subjects were randomized (16 early, 17 late), of which six subjects dropped out (1 early, 5 late). Both groups showed progress over time, with predominantly higher scores in the early AFO-group. The progress in BBS, FAC and 6MWT showed statistically significant differences (resp. $p=0.006$, $p=0.033$ and $p<0.001$) favoring the early group over time. The differences between the two groups were largest up to 13 weeks.
Discussion and conclusions Early AFO-provision after stroke shows a positive trend on all outcome measures, with significant differences over time for the BBS, FAC and 6MWT in favor of early AFO-provision. Clinically, early AFO-provision in the rehabilitation post-stroke seems beneficial on functional outcome measures related to balance and mobility.

OP217
RESULTS OF BOTOX APPLICATION IN ALLODYNIA OF PATIENTS WITH COMPLEX REGIONAL PAIN SYNDROME

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Introduction: Complex regional pain syndrome (CRPS) previously known as reflex sympathetic dystrophy is a chronic neurological disorder involving the limbs characterized by disabling pain, swelling, vasomotor instability, sudomotor abnormality, and impairment of motor function. CRPS is not uncommon after hand surgery and may complicate post-operative care.
Purpose: To investigate the efficacy of Botulinum toxin A (BoNT-A) in allodynia of patients with complex regional pain syndrome.
Method: A total of 20 patients were studied. All participants of a randomized, prospective, double-blind protocol implement. Patients were rated for at baseline and at 2 weeks and 2 months after BoNT-A administration. Ratings included brief pain inventory, clinical pain impact questionnaire, quantitative skin sensory test, sleep satisfaction scale,hospital anxiety and depression scale and patient global satisfaction scale. BoNT-A was injected intradermal and intramuscular, 10 units/site into the allodynic area and the intense pain muscular area (total dose 20-100 units).
Results: The patients with allodynia and hiperalgesia showed a significant response after treatment.
Discussion and conclusions: Intradermal and intramuscular administration of BoNT-A into the allodynic skin of the patients with complex regional pain syndrome (CRPS) was successful to improve pain.

OP218
EFFECTS OF COMBINED TREATMENT OF COOLED RADIOFREQUENCY AND PHYSICAL THERAPY ON PAIN RELIEF AND FUNCTIONAL IMPROVEMENT IN PATIENTS WITH CHRONIC INOPERABLE KNEE OSTEOARTHRITIS: PRELIMINARY RESULTS

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Introduction: Chronic knee osteoarthritis is one of the most common diseases of advanced age. The gold standard treatment is total knee joint replacement. However, some patients are not eligible for invasive procedures due to BMI, age and other comorbidities. Cooled radiofrequency (RF) of genicular nerves is a percutaneous antalgic electrotherapy. It is the unique solution for chronic knee pain in inoperable patients.
Purpose: To evaluate efficacy of combined treatment of cooled radiofrequency and physical therapy on pain relief and functional improvement in patients with chronic inoperable knee osteoarthritis.
Method: First four of twenty participants were treated with Cooled RF and then with physical therapy. The study population was comprised of patients with chronic knee pain and radiologic tibio-femoral OA. Participants were assessed with a diagnostic anesthetic nerve block with bupivacaine to confirm that the target genicular nerves were pain-carrying. Only patients who experienced pain relief of 50% were eligible for enrollment. Patients are assessed on the operative day with NRS, DN4, KOOS, Oxford knee Score, Lequesne Index. All patients were followed up one, three, six and twelve months after the procedure.
Results: We observed a change in NRS 3,25 ± 2,62 (p 0,09), DN4 1,5 ± 1,91 (p 0,06) and a Lequesne Index 13,6 ± 3,1 (p 0,5) at one and three months. There was not a difference in KOOS and Oxford Knee Score. These results are still not statistically significant due to low sample size. We intend to evaluate long term effects on a bigger sample size. There were no major complications associated with the procedure.
Conclusions: The study is currently ongoing. These preliminary data show a clinically degree of pain relief at one and three months follow-up in agreement with other papers found in literature. According to our experience, RF in knee OA is a promising therapy without complications associated.

OP219
UNDERSTANDING THE EXPERIENCE OF PAIN: CAUSES AND EXPECTATIVES

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Introduction: Pain is a common problem that presents a major challenge to healthcare providers around the world.
Purpose: Analyse the several factors that may affect and influence chronic pain and the consequent therapeutic strategy.
Method: A retrospective study was conducted, selecting first appointment patients attending PMR specialist of a Pain Unit of a central hospital, from January 2014 to September 2015. The following variables were analysed: age, gender, diagnose (possible/definitive) and the results of the screening tools: Visual Analogue Scale (VAS), PainDETECT questionnaire, Douleur Neuropathique en 4 Questions (DN4), Brief Pain Inventory (BPI) and Hospital Anxiety and Depression Scale (HADS).
Results: The records of 144 patients were analysed, with ages between 21 years and 88 years. Female patients were predominant (70,9%) in this study. The most common diagnostic was Fibromyalgia (23,9%). According to DN4 scores, the majority of the patients (81,0%) had a neuropathic component, against 34% by painDETECT. These patients, classified as having neuropathic pain had significantly higher values in the VAS score. HADS results were abnormal in most of patients and there was a positive correlation between HADS scores and the BPI domain "Enjoyment of Life", which was statistically significant (anxiety $r=0.41$ $p<0.001$; depression $r=0.41$ $p<0.001$). Many of these patients needed a psychological support and the most common treatment prescribed in this population was oral medication associated with hydrotherapy.
Discussion and conclusions: Characterize the pain population is the key to achieve clinical success in order to establish the realistic goals of treatment. These goals must focus on restore the normal function, provide a better quality of life, decrease the use of medication, and prevent relapse of chronic symptoms.

OP220
APPLICATION OF PHYSIOTHERAPY IN EARLY RECOVERY PERIOD AFTER ABDOMINAL REMOVAL OPERATIONS OF MALIGNANT NEOPLASMS

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Introduction: Methods of physiotherapy in cancer patients are not pathognomonic; they are used in surgical patients either to reduce pain syndrome, prevent stagnation and motor-evacuation disorders, or to improve reparative processes.
Purpose: Evaluation of the influence of complex rehabilitation treatment on the quantity of postoperative complications (bronchopulmonary complications, thromboenbolic complications, disorders of motor-evacuation function of the intestine), and the length of hospital stay in the early postoperative period.
Method: We observed 58 patients aged from 36 to 84 undergone surgeries for oncological diseases of intestine. In the complex therapy we used methods of physical therapy (breathing exercises, general developmental exercises, early intensification, verticalizations, massage of the chest). We also used methods of physiotherapy (inhalation, magnetic pulse stimulation). We used special equipment: nebulizer « Neb-aid by Flame», «АМИТ-01», «Hivamat-2000». The control group has been formed retrospectively and consisted of 60 patients aged from 35 to 83 who received no rehabilitation.
Results: We found the improvement of motor-evacuation function of the intestine in patients who received pulses magnetotherapy was achieved 3 days earlier versus control group. Reduction of complication quantity in the main group was 25,1 vs. 52 in control group. Hospital stay was 15 days in the main group vs. 21,6 days in control group.
Discussion and conclusions: Early rehabilitation of patients after surgical removal of malignant neoplasms can help to accelerate the motor-evacuation function and reduce both the number of postoperative complications and length of hospital stay.

OP221
A COMPARISON BETWEEN PILATES EXERCISE AND BALANCE EXERCISE ON BALANCE AND BALANCE CONFIDENCE IN COMMUNITY-DWELLING ELDERLY.

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Introduction: Pilates exercise and balance exercise are programs to increase balance and confidence. These exercises have usually been used to improve balance, muscle strength, and body flexibility resulting in improved respiratory control and prevention of falls in the elderly. However, there is not enough evidence to support the effects of pilates exercise and balance exercise on balance and balance confidence in the elderly.
Purpose: To evaluate the effects of Pilates exercise and Balance exercise programs on improving balance and increasing confidence in the Community-dwelling Elderly.
Method: Forty-five participants were randomly allocated into 3 groups, each of which had 12 exercise sessions over a period of 4 weeks. Group 1, Pilates exercise group; group 2, Balance exercise group; group 3, Control group (resting in bed, no exercise). Time Up and Go test (TUGT) and Active-Balance Confidence scale (ABC-scale) were measured before and after the intervention period.
Results: While group 1 and group 2 showed a significant improvement in TUGT after 4 weeks of the program ($p < 0.05$) (Wilcoxon signed-rank test), group 1 was significantly higher in the improvement of TUGT when compared with group 3 (Kruskal–Wallis one-way analysis of variance). However, there were no significant differences in any parameters in group 3.
Discussion and conclusions: The Pilates exercise and Balance exercise programs can improve balance due to their effect on the somatosensory system, proprioception, and increased confidence of the elderly. This study suggests that Pilates exercise and balance exercise are an effective intervention that can improve balance and balance confidence which may help to prevent falls among the elderly.

OP222
PREDICTION OF FALLS IN HEMIPLEGIC STROKE PATIENTS BY USING DIGITAL BALANCE PLATFORMS

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Introduction: Stroke patients have a high fall risk not only at the early stages of rehabilitation but also after discharge. Numerous factors can be responsible for balance disorders and the identification of those is necessary in order to have a focused rehabilitation plan for stroke patients.
Purpose: Aim of this study is to predict the fall risk in stroke patients after discharge by using an objective diagnostic method that can quantify their balance ability. Digital Balance Platforms can provide feedback to the clinician since they are not only a diagnostic tool but also a reliable rehabilitation method by using the proper software.
Method: 52 stroke patients (38 males, 14 females; age 70.1± 8.5 years) were included in this study. All patients had an early balance evaluation on the digital balance platform when they were able to achieve the standing position. Then they had to follow a customised rehabilitation programme that included also training on the platform. At their discharge they underwent a new balance evaluation on the platform. After discharge the caregivers had to report any fall that the patient had the following month in a dedicated falls report.
Results: The majority of the patients that had progressively improving results in balance parameters proved to have the lowest risk in falls ($p<0.01$). Patients that had poor results at the first evaluation appear to be more prone to falls after discharge ($p<0.05$) although some of them had significant improvement in balance parameters ($p<0.05$).
Discussion and conclusions: Balance training by using digital balance platforms appears to be a very effective rehabilitation method. Those platforms can be used also as assessment tools by providing objective measures. The first evaluation can be predictive since patients with a high baseline seem to have a decreased fall risk after discharge.

OP223
OUR EXPERIENCE OF USING GENERAL CRYOTHERAPY IN THE COMPREHENSIVE TREATMENT OF ALIMENTARY-CONSTITUTIONAL OBESITY

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Introduction: Nowadays therapy of obesity is based on the non-drug treatment for optimizing of metabolic rate, reducing of body mass and decreasing the risk of diseases associated with obesity. These methods includes gymnastics, massage, lymphodrenage and the general cryotherapy.
Purpose: To evaluate the effectiveness of general cryotherapy in the comprehensive treatment of alimentary-constitutional obesity.
Method: We observed 27 patients (mean age=43) with alimentary-constitutional obesity, 21 women (78%) and 6 men (12%). The studied group included 37% with 1st degree of obesity and 63% with 2nd one. All patients received the diet therapy, exercises, hydrokinesitherapy, training on circular machines, lymphodrenage and general cryotherapy. The control group consisted of 25 patients the same age, sex and the degree of obesity as the studied group. These patients received the same treatment without cryotherapy. The general cryotherapy performed on special camera "01 - CRYON". The temperature in camera was from -130 to -180 °C. The time of the procedure was from 30 to 180 seconds. The course consisted of 30 procedures. Body mass index (BMI) was analyzed.
Results: The results were evaluated at 3 months . In the studied group with the 1st degree of obesity the treatment showed reduction of BMI from 33,5±0,8 to 28,3±1,2 ($p>0,05$). The patients with the 2nd degree of obesity showed reduction from 38,7±1,1 to 33,1±1,1 ($p>0,05$). In the control group with 1st degree of obesity the BMI decreased from 32,9 ±1,1 to 29,1±1,3 ($p>0,05$), patients with 2nd degree of obesity the reduction was from 39,1±1,5 to 35,1±1,6 ($p>0,05$).
Discussion and conclusions: The use of general cryotherapy in the comprehensive treatment of alimentary-constitutional obesity showed substantially improvement of treatment results.

OP224
THE EFFECTIVENESS OF INTERMITTENT PNEUMOCOMPRESSION IN THE TREATMENT OF EXPRESS EDEMA SYNDROME OF LOWER EXTREMITIES IN THE DEPARTMENT OF INTENSIVE CARE

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Introduction Intermittent pneumocompression improved a positive effect on the dynamics of expressed edema syndrome of the lower extremities of various origins that is resistant to standard drug therapy.
Purpose To evaluate the effectiveness of method of intermittent pneumocompression using Kendall SCD 700 Series in the treatment of edema syndrome of different genesis.
Method The main group 24 patients: 14 - congestive heart failure, 6 - swelling with chronic venous insufficiency of the lower limbs, 4 - swelling in the background hypoproteinemia. All patients were under continuous cardiorespiratory monitoring. The degree of edema syndrome was evaluated by measuring the circumference of the hips in the middle third, the circumference of the tibia in the upper third, ultrasound thicker subcutaneous fat thighs. All patients received standard medical therapy aimed at correcting edema syndrome and intermittent pneumocompression using apparatus Kendall SCD 700 Series, constantly, according to standard procedure. The control group (retrospective):26 patients with edema syndrome had standard medical therapy.
Results The patients of main group after 3 days had a significant reduction of edema of the lower extremities: hip circumference decreased by an average of 4.6 cm, of the tibia decreased by an average of 2.1 cm, according to the ultrasound a decrease in the thickness of subcutaneous fat on in average of 4.8 cm. In the control group, on the background of drug therapy had reduced the circumference of the femur and tibia by 2.4 and 1.3 cm, according to the ultrasound the thickness of subcutaneous fat in the hips 2.3 cm.
Discussion and conclusions The use of intermittent pneumocompression is effective in the treatment of express edema syndrome, resistant to standard drug therapy in severe patients.

OP225
A PROSPECTIVE STUDY TO COMPARE CLINICAL EXAMINATION AND ULTRASOUND EXAMINATION IN PATIENTS WITH LYMPHEDEMA IN UPPER EXTREMITY AFTER BREAST CANCER SURGERY

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Introduction Postmastectomy lymphedema after a breast cancer is an excessive accumulation of lymphatic liquid in the upper extremity of the affected breast. This lymphedema is the most prevalent in First World Countries, with prevalence about 15-20% among breast cancer survivors. The lymphedema patient's valuation is a clinical evaluation measured by circometry (the measurement of each arm outline, especially the difference between them) and palpating fibrosis. Recently, there have appeared some studies about ultrasound examination.
Purpose The aim of the present work is to know if ultrasound examination can provide more information about prognosis and therapeutic decisions than traditional physical and circometry examination.
Method It is an observational prospective, non-randomize study, with a diagnosis of lymphedema, with physical therapy. The variable analysed was: Age, years after the surgery, sentinel node technique and/or lymphadenectomy, chemotherapy and radiotherapy treatment, use or not of a compression sleeve, ultrasound measures and circometry and structures (before and after treatment).
Results Twelve patients have been analyzed. All of them received surgery, chemotherapy and radiotherapy. When the global measurement has decreased, the thickness of the subcutaneous tissue has also decreased but, in most of them, thickness of the skin has increased. Three months after treatment all of them had better global measurements than after treatment and fibrosis level had not changed.
Discussion and conclusions There are patients with lymphedema that improves after manual treatments, but some of them do not improve so much. With an ultrasound machine we can see the characteristic of tissues, so we can search the relationship between the tissues before and after treatment. Breast cancer has high direct and indirect cost, so with better capacity of prognosis these costs could be minor. As a conclusion, Physical therapy improves the oedema in patients with lymphedema, mainly in minor lymphedema.

OP226
TASK-ORIENTED PHYSICAL EXERCISE USING POSTURAL RE-ALIGNMENT WITH BODY WEIGHT SUPPORT IN CHRONIC STROKE

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Introduction The recovery of functional gait is the main target for subjects who had suffered a stroke. The methods designed to improve balance and gait appear to be essential for skills and autonomy and to reduce the costs of assistance.
Aim The aim of our study was to evaluate the improvement of stroke victims in the chronic phase through the rehabilitation of gait, balance and posture using postural re-alignment with specific body weight support.
Methods The study includes 20 subjects with residual hemiparetic gait after stroke. Evaluation with international rating scales, gait analysis and stabilometric test was carried out at the beginning and after the 1st and the 3rd month of therapy; a follow-up control was made 3 months after the end of the rehabilitation program. All subjects underwent the rehabilitation protocol with Dynamic Antigravity Postural System 2 times a week for 3 months and were also treated with high efficiency focused acoustic waves (ViSS) to increase strength and muscular endurance (300Hz) or to reduce spastic hypertonia (200-120 Hz).
Results The study shows a significant improvement in gait and balance with the persistence of results at the follow-up 3 months after the end of treatment. The subjects showed an increase in walking speed, greater stability and a consequent reduction of sedentary lifestyle with less risk of complications or recurrence.
Discussion and conclusions In conclusion, the realignment of the body subsystems with proprioceptive information which is provided by the stabilizer blocks on the SPAD, have proved to be able to determine an increase in the knowledge of the motor action, further influencing the persistence of the obtained results probably related to the supposed cortical re-learning.

OP227
CORRELATION BETWEEN NIHSS SCORE AND FUNCTIONAL OUTCOME MEASURED BY MODIFIED RANKIN SCALE IN ACUTE ISCHEMIC STROKE PATIENTS

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Purpose: of our study was to assess the correlation between different groups of NIHSS scores and modified Rankin score (mRS) as functional outcome measure in patients with acute ischemic stroke (AIC).
Material and methods: We have evaluated all 141 patients who were diagnosed with AIC and received rtPA treatment between 2012 and 2014. Regarding the scores of National Institute of Health Stroke Scale (NIHSS), patients were divided into 3 groups: Group I (NIHSS≤6), Group II (NIHSS between 7-15) and Group III (NIHSS≥16). The initial NIHSS assessment was done at the time of rtPA administration. For the estimation of functional outcome we used modified Rankin Scale (mRS). The patients mRs score were evaluated twice: at discharge (Group A) and on control follow-up (Group B).
Results: The mean value of NIHSS score in Group I was 5.3±0.9, in Group II 11.0±2.5 and in Group III 19.7±3.2.The mean value of mRS in Group A was 3.1±1.9 and in Group B 2.4±1.9. There was significant difference of mRS scores at discharge between different NIHSS groups ($p<0.001$), particularly between Group I and Group III ($p<0.001$) and Group II and Group III ($p<0.001$). The effects size of mRS chages (ç2) between different NIHSS groups at discharge was 51.8%. Significant difference of mRS scores between different NIHSS groups persisted at follow-up ($p=0.003$), particularly between Group I and Group III ($p=0.002$). The effects size of mRS chages (ç2) between different NIHSS groups at follow up was 53.8%.
Conclusion: We have demonstrated that at discharge (short term) there was significant improvement in mRS values in patients with NIHSS≤15, while at follow-up (long term) significant improvement persisted only for patients with NIHSS≤6. Therefore, favourable long term functional outcome could be expected in AIC patients with lower initial values of NIHSS scores.

OP228
PREDICTIVE FACTORS OF UPPER LIMB FUNCTIONALITY IN STROKE PATIENTS – PILOT STUDY

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Introduction: Approximately 70% of stroke survivors have an acute phase incomplete hemiplegia with brachial predominance, which makes the functional recovery of the upper limb (UL) an important and challenging goal.
Purpose: The aim of this study is to establish a predictive model of upper limb functional outcome in stroke patients based on blood markers, imaging and socio-demographic factors.
Method: Consecutive patients, aged 18-85 years, admitted to the Stroke Unit of a central hospital between January and June 2015 for ischemic stroke board of cerebral middle artery (CMA) were included. The first evaluation was performed 24 hours after the onset of symptoms and included peripheral blood samples for C-reactive protein (CRP), fibrinogen and D-Dimers measurements, topographic brain lesion evaluation using CT scan and stroke classification according to TOAST criteria and NIHSS score. Follow-up assessment at 48 hours, 3 and 12 weeks included evaluation of upper limb functionality using the Stroke Upper Limb Capacity Scale (SULCS) and the Functional Independence Measure (FIM) scale. Peripheral blood level of S100B protein was assessed 48 hours after the stroke.
Results: We engaged 34 patients, 19 males (56%), with a mean age of 64 years. S100B blood concentration and initial NIHSS score correlated with FIM and SULCS scores at 48 hours, 3 and 12 weeks ($p<0.05$). Inflammatory factors (CRP, fibrinogen and D-dimers) correlated with each other but not with S100B blood concentration nor with the functional evaluation (MIF and SULCS) at 3 and 12 weeks.
Discussion and conclusions: In stroke survivors, admission NIHSS score and peripheral blood S100B at 48 hours are strong acute phase predictors of functionality at 3 and 12 weeks after the stroke event. In contrast, our study showed no correlation between initial 24 hours inflammatory peripheral blood parameters and stroke functionality.

OP229
CHRONIC PAIN AFTER STROKE: PREVALENCE, ETIOLOGY AND RISK FACTORS

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Introduction: Chronic pain is a usual complication after stroke and it has implications on rehabilitation outcomes, not always properly valued.
Purpose: The main aims of this study are: to evaluate the prevalence of chronic pain in stroke patients in different stages of the event (acute, subacute and chronic); to classify the type of pain; and to understand the factors that can influence pain.
Method: The data was collected in structured interviews and consultation of electronic clinical data. Pain evaluation was measured with scales validated in portuguese population: painDETECT, DN4, Brief Pain Inventory. Eligible patients to acute and subacute stage were admitted in our unit between July and December. The chronic patients were evaluated in the outpatient clinic. Were excluded the patients which the onset pain started before the stroke.
Results: Until the present day, 10 patients in acute/ subacute stage and 15 in chronic stage were evaluated. Majority of patients had an onset pain after stroke. Cognitive impairment and communication disability, were not a barrier to the evaluation. The main causes of pain found were: persistent headache, central poststroke pain, plegic shoulder, painful spasticity and other skeletal muscle conditions associated with biomechanical changes.
Discussion and conclusion: Pain is a major symptom in poststroke patients in rehabilitation programs, with a high impact in quality of life. Precocious diagnosis is important, so it can have the appropriate rehabilitation approach.

OP230
EFFECTS OF AN ANKLE-FOOT ORTHOSIS ON WALKING AND MOBILITY AFTER STROKE: A CLINICAL TRIAL

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Introduction: Recovering the ability to walk is an important goal of the rehabilitation process of stroke patients, whom frequently develop equino-varus feet. Ankle-foot orthosis(AFO) are prescribed to facilitate ankle control in cases of equinus and/or varus foot improving the gait pattern.
Purpose: The aim of the present study was to analyze the effect of an AFO on walking and mobility of stroke patients.
Method: Twelve subacute/chronic stroke patients with equinus and/or varus foot which were able to walk without assistance, were assessed with and without a posterior leaf spring AFO. Physical performance was valued with Fugl-Meyer, mobility was assessed using the Timed Up & Go test and gait measurements were performed with a portable GAITRite system.
Results: There was a tendency of improvement on mobility expressed by a Timed Up & Go test decrease (52.8 to 45.4s) when using AFO, but no significant difference (p=0 .695). When using an AFO compared with no AFO, a tendency to speed improvement (25.0 to 27.7cm/s, p=0.969), cadence increase (56.9 to 62.2steps/min, p=0.875), cycle time decrease (2.16 to 1.90s, p=0.388) and base of support decrease (14,1 to 13,7cm, p=0.814) was found, although without significant difference. The positive difference in speed with AFO use had moderate correlation with a low Fugl-Meyer assessment lower extremity score (CC=-0.635) and with using the AFO before testing (CC=-0.697).
Discussion and conclusions: According to our study, there is a tendency that supports the use of an AFO on walking improvement. However, the impact of this orthosis was inconclusive, probably due to a small sample size. Although it is known that a small change in walking speed may be of great importance for these patients. The correlation between positive difference in speed with AFO use and lowest Fugl-Meyer assessment lower extremity score suggest that AFO will be more effective in more impaired patients.

OP231
INDIVIDUAL APPROACH IN DYSPHAGIA REHABILITATION

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Introduction Swallowing improvement after brain damage is a significant challenge for neurorehabilitation. Both surface and intralaryngeal electrostimulation is successfully used in practice. In recent years, the possibility of central dysphagia rehabilitation expanded through new noninvasive technologies such as transcranial magnetic stimulation.
Purpose To evaluate the effectiveness of personalized approach to treating patients with dysphagia in the subacute phase of stroke.
Method The study included 27 patients with severe dysphagia (m = 14, f = 13) due to acute stroke. The median age was 51 ±6.2 years. The severity of dysphagia was evaluated clinically and with the use of different scales such as 3-ounce water swallow test and LIM and FOSS. Scintigraphy of swallowing act was performed to differentiate individual phases of swallowing in all patients before the onset of rehabilitation. Patients were divided into 2 groups which both received the basic program of logopaedic exercises, tactile and thermal stimulation and intralaryngeal electrostimulation. The first group of 15 patients with a detected disorder of an oral phase of swallowing also received TMS of primary motor and premotor cortex. The second group of 12 patients with mainly a pharyngeal phase disorder received TMS of cortical representation of the pharyngeal muscles (m. mylohyoideus). The rehabilitation program lasted 21 days.The retrospective control group included 25 patients (m = 14, f = 11) receiving only basic program.
Results The improvement of swallowing act was achieved in each group of patients and was evaluated using bar graphs and scintigraphy method. However, in groups where personalized nTMS was appled better results were achieved. Regression of severity of dysphagia in groups 1 and 2 amounted up to 25-27%, while in the control group totalled 16-18%.
Disscusion and conclusions Personalized approach in swallowing recovery after stroke with stimulation technology improves the efficiency of rehabilitation.

OP232
THE EFFECTS AND MECHANISM OF MIRROR NEURON SYSTEM BASED TREATMENT FOR APHASIA: EVIDENCE FROM NEUROPSYCHOLOGICAL AND FUNCTIONAL NEUROIMAGING STUDIES.

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Introduction: Hand action observation can activate mirror neuron system (MNS), which includes critical language areas such as Broca's area, Wernicke's area and supramarginal gyrus in left hemisphere. However, whether hand action observation training can improve aphasic patients' language functions is still unknown.
Purpose: To reveal the therapeutic effect and corresponding mechanism of hand action observation training for aphasic patients' language functions.
Method: 18 stroke patients with aphasia were divided randomly into 3 groups (Group A, B and C). Group A were instructed to observe the hand actions of object manipulation and repeat the name of the object. Group B were required to observe the dynamic (slowly rotating) object and repeat its name. Group C received routine aphasia therapy. Each training protocol lasted 35 minutes per day, 5 days per week for 2 weeks. Picture naming test, 5 sub-test and aphasia quotient (AQ) of western aphasia battery (WAB), 3 sub-test in China Rehabilitation Research Center aphasia examination (CRRCAE), were assessed before and after 2 weeks' training. Functional magnetic resonance imaging (fMRI) study was implemented to reveal the brain activations difference between hand action and dynamic object observation in 6 participants.
Results: All 3 groups made significant progresses in AQ of WAB and total score of sub-test of CRRCAE after therapy. However, Group A and C are significantly better than Group B. Compared with Group C, Group A showed significant improvements in picture naming test, spontaneous speech (content) in WAB and speech production in CRRCAE. fMRI showed hand action observation resulted in more activations than dynamic object observation in MNS, including Broca area, Wernicke area and supramarginal gyrus in the left hemisphere.
Discussion and conclusions: Hand action observation training can improve aphasic patients' language functions, which may be related to its facilitations to the activations and plasticity of MNS.

OP233
THE USE OF THE WALKING ROBOT "EKSO™" FOR WALKING TRAINING IN PATIENTS WITH HEMIPLEGIA AFTER STROKE; A PILOT STUDY

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Introduction: Ekso™ is a wearable, motorized exoskeleton that enables patients with walking difficulties to move from sit to stand, to walk forward on an even surface and sit down. Preliminary findings at our hospital indicate that the Ekso™ may be a safe and feasible training device for patients with stroke.
Purpose: To describe the training data from the Ekso™ sessions, patient experiences and changes in gait and sit to stand.
Method: Five patients with stroke were medically cleared, screened according to Ekso™ guidelines for participation and gave informed consent. Ekso™ walking data, perceived exertion (Borg scale, 0-20), satisfaction (1=dissatisfied, 5=very satisfied), and tasks from Motor Assessment Scale (MAS) (0-5) were analyzed.
Results: Two women and three men participated. Median age was 48 years (range 43-64) and four had ischemic and one had hemorrhagic stroke. A total of 39 Ekso™ sessions (range 4-10) were conducted. Mean standing time was 21 minutes (range 18-25), and walking time was 8 minutes (range 6-10). Mean number of steps was 306 (range 246-405).The mean score on the Borg scale was 9 (range 7-13), indicating a low level of exertion. Median patient satisfaction with training was 5 (range 3-5). MAS gait function scores at admission ranged from 0-2 and at discharge from 0-3. MAS sit to stand scores ranged at admission from 1-2 and from 2-5 at discharge.
Discussion and conclusions: Participants were very satisfied with the walking training, had a low exertion and trained standing and walking as planned. Walking after stroke is often characterized by asymmetry in rhythm and in step length. With Ekso™ the stroke patient can experience an even walking rhythm, sufficient weight transfer and loading on the affected side, with many repetitions in a safe way. Ekso™ may be a new possibility in training of walking movements over time.

OP234
THE ROLE OF CERVICAL ISOMETRIC EXERCISES IN CERVICAL SPINE ALIGNMENT OF DYSPHAGIC ADULT PATIENTS WITH HEMIPARESIS OF CEREBRAL ORIGIN: A PROSPECTIVE COMPARATIVE STUDY

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Introduction: Hemiparesis can cause cervical spine scoliosis, kyphosis or hyperlordosis.
Purpose: This study aims to evaluate the use of cervical isometric exercises in dysphagic adult patients with cervical spine alignment disorders due to cerebral origin hemiparesis.
Methods: This is a prospective comparative study of dysphagic adult patients with hemiparesis in the rehabilitation phase. In addition to the standard physical and speech therapy therapeutic approach, cervical isometric exercises were conducted by a group of patients. Patients had cervical spine radiographs in erect (sitting or standing) position coronal and sagital C2-C7 Cobb angle and a videofluoroscopic swallowing study (VFSS) to evaluate deglutition (0=normal, 1=penetration, 2=aspiration) at 2 time points (at the beginning and at the end of the therapeutic program).
Results: Seventy consecutive patients with hemiparesis (59% with stroke, 27% with traumatic brain injury and 14% with other causes) of a mean (SD) age of 52±15 years were included in the study. Ôhirty-seven of them conducted cervical isometric exercises in addition to their therapeutic program. At the last follow-up, patients had improved ($p<0.001$) cervical alignment, in both coronal and sagittal plane, and deglutition. Patients who conducted cervical isometric exercises had more pronounced correction ($p<0.001$) of cervical alignment in both planes and achieved greater improvement ($p<0.05$) of deglutition too, than patients who did not conduct such exercises.
Conclusions: Dysphagic adult patients with hemiparesis of cerebral origin in the rehabilitation phase who underwent cervical isometric exercises showed more significant correction of cervical alignment and more pronounced improvement in deglutition compared to patients who did not include cervical isometric exercises in their therapeutic program.

OP235
MOTIVATIONAL INTERVIEWING BASED PSYCHOLOGICAL COUNSELING IN REHABILITATION. IS IT EFFECTIVE FOR IHD PATIENTS?

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Introduction: There are no doubts that motivational interviewing (MI) (Miller, Rollnick, 2013) is an effective technique for excessive drinkers to reduce alcohol usage. Multiple studies confirmed successful appliance of MI for changing unhealthy behaviours (Knight et al., 2006; Thompson et al., 2011) such as unhealthy diet, smoking, physical inactivity. Nevertheless, there is a lack of information how it works with Ischemic heart disease (IHD) patients during their rehabilitation.
Purpose: Study's goal is to verify MI suitability for changing IHD patients' health behaviours during rehabilitation.
Method: Research was performed in Abromiskes rehabilitation hospital's Cardiology department (Lithuania). Study's sample consisted of 179 patients (124 men, 55 women). All subjects from the sample were randomly chosen patients from all Abromiskes rehabilitation hospital's IHD population during the research period. 83 patients were invited to change their health behaviour during 1 to 4 MI based psychological counseling sessions. The rest of sample was the comparison group. Readiness to Change Questionnaire (Rollnick et al., 1992) was used at the beginning and at the end of rehabilitation for evaluation of readiness to change health behaviour.
Results: Mann-Whitney criteria showed statistically significant difference ($p<0.05$) between experimental and control groups in readiness to change their physical activity (mean ranks of experimental group subjects were higher than the ones in control group at the end of rehabilitation). There are no statistically significant differences between experimental and control groups in readiness to change alcohol, smoking, unhealthy nutrition, nevertheless the mean ranks indicate that patients in experimental group have higher readiness to change.
Discussion and conclusions: MI based psychological counseling is effective for changing IHD patients' physical activity. Since this study is still in progress more MI based psychological counseling peculiarities will be clarified in the future. Research was supported by Research Council of Lithuania (Grant: MIP-081/2014).

OP236
ENDOGENUS THERMOTHERAPY AND VIBRATION IN CHRONIC NECK PAIN: A CONTROLLED RANDOMIZED STUDY

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Introduction. Chronic pain syndrome affecting the neck is very common and clinically relevant. The complaints can be very obstinate and the treatment remains challenging. The underlying cause is often not easily detected, as there is a mismatch between the patient's complaints and suffering and the "objective" diagnostic results.
Purpose. To demonstrate the efficacy of a combined treatment with endogenus thermotherapy (diathermy) in combination with mechanical vibration (infrasound), compared to only endogenous thermotherapy, in chronic neck pain.
Method. 39 patients (average age 52 years) were enrolled and randomly divided in 2 groups: group DV, treated by endogenous thermotherapy and mechanical vibration, using the only one device (Imperium 400, Brera Medical Technologies, Italy); group D, treated by only endogenus thermotherapy. For the outcomes measures the Neck Disability Index was used with a follow up to three months. T student test for independent and paired samples was used for the statistical analysis.
Results. In both groups a statistically significant reduction of the Neck Disability Index was observed (P<0,05), but in group DV a greater reduction in the percentage of disability was evident.
Discussion and conclusions. The emission of energy flows (radiofrequency) of high intensity (400 watts) in combination with the mechanical vibration could accelerate and amplify the intra and extracellular effects. Basing on our data, both methods revealed a good potential for the alleviation of the chronic neck pain, but the combined treatment, diathermy and vibration, seems to be more effective than the only diathermy.

OP237
THE IMPORTANCE OF SCOLIOSIS SCHOOL AS AN INFORMATION TOOL FOR PATIENTS WITH ADOLESCENT IDIOPATHIC SCOLIOSIS AND THEIR FAMILIES

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Introduction Adolescent idiopathic scoliosis (AIS) is the most common type of scoliosis, affecting around 4.1-5.7% of the children between ages 10 to 18. It is a chronic health problem in wich the symptoms and the treatment could affect negatively to the patients quality of life. In addition to that, we deal with a difficult and sensitive group of patients, the adolescents, who most of them are moodies, insecure and suffer from low self-esteem. Lack of information about AIS can influence negatively on treatment success.
Purpose The aim of this study is to create a scoliosis school about AIS in order of improving patients and families information.
Method We made an exhaustive search in the most famous internet browsers. We realise most of the information has poor cientific quality and without a comprehensive language for adolescents. However, all of the patients and families use this tool to inform themselves. Because of this we decide to create scoliosis school (SS) to improve their information.
Results Our target population are adolescents with AIS treated with brace. They are called to assist to SS, in which we explain what is scoliosis, why they have to wear the brace, it's importance and why they must make exercise. A model patient we choose gives them some advices and tricks about how wear the brace. Finally, we introduce them a scoliosis website, runned by doctors of our department, in which we explain in depth all the aspects we commented before. In addition there is a forum to ask us, or the model patient, all the questions they have related to scoliosis or the brace.
Discussion and conclusions Patients first impressions and satisfaction has been really high after SS. Further work is needed to determine if SS improves adolescents treatment adhesion and modifies quality of life.

OP238
ELASTIC TAPE APPLICATION FOR PERINEAL REHABILITATION IN PATIENT WITH RECTUS ABDOMINIS MUSCLE DIASTASIS: CASE REPORT

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Introduction: Urinary incontinance remains a clinically important complication after radical prostatectomy (RP). Peri operative pelvic floor muscle training reduces urinary incontinance for man undergoing to RP. This program of exercises involves necessarily vertebral column , diaphragm and abdominal muscles too, so it isn't executable in the presence of diastasis of the rectus abdominis muscle because the diastasis increases the abdominal volume and reduces the pressures altering the synergy between the other three walls.
Purpose: Our case report was a man sixtyfive years old, affected by prostate cancer before coming for a perioperative cicle of pelvic floor muscle training before RP, but he had a rectus abdominal diastasis too. So we tried to find a conservative solution that could contain the abdominal volume during therapeutic exercises.
Method: We used an elastic tape application of 3 orizzontal X shaped strips 15cmx5cm at the tension 75% (Under umbilicus, 1cm above umbilicus, 6cm up umbilicus) and 2 vertical strips 30cmx5cm at tension 50% (along linea alba). This application was repeated everyday before the physiotherapy pelvic floor rehabilitation (PPFR) session (10 daily session last 30 min each).
Results: The effect was an abdominal circumference reduction of 3 cm and a difference of Ultrasouns's measurement of diastasis of 2,4 cm during the abdominal contraction between no treatment and treatment evaluation.
Discussion and conclusion: This original conservative treatment allowed the patient to complete efficiently the perineal rehabilitation program. This experience proposes an original and alternative use of the elastic tape, than previously reported in the literature, as transient, but valid therapeutic solution, for a pathology that necessities of a surgical solution. Rectus abdominal diastasis and pelvic floor dysfunction occur frequently in women post partum. The probability to fall in this situation is very high.

OP239
PATIENT HEALTH CONCERN AFTER LIFE CHANGE EVENTS

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Introduction: Many of the patients admitted in a Physical and Rehabilitation Medicine (PRM) department have been exposed to an event that require an adjustment in their pattern of living (Life Change Event – LCE). The stress induced by this kind of events increases the risk of other health problems. The psychological impact of LCE may alert the affected individuals to these other health issues.
Purpose: To evaluate the effect of LCE on patient concern about their health.
Method: Retrospective data analyses and cross-sectional survey including patients admitted in a PRM department between 2nd and 5th November 2015. Data of 41 patients were analysed. The survey evaluated their global health concern and concern regarding the major causes of mortality and morbidity, as well as the intention to modify important risk factors.
Results: The LCE at admission were traumatic and non-traumatic encephalic lesion, spinal cord injury and limb amputation, polytrauma without encephalic injury and peripheral neuropathy. The majority of patients (93%) declare an increase in their concern with global health after the LCE, independently of the aetiology of the LCE (with exception to non-traumatic amputation). The greater difference between previous and after LCE concern was related to the risk of "infections", "stroke" and "depression". The smaller changes are described to the diagnostic of "diabetes mellitus" and "overweight". The majority of patients have the intention to decrease alcohol and tobacco consumption and to increase physical exercise after the LCE. No greater changes are expected in salt and sugar consumption.
Discussion and conclusions: LCE provoke on individuals social and psychological changes. They are described as a biographic impairment, behind the biological one. Patients in a PRM department describe an increased concern with their health after LCE, and must be used to enhance primary and secondary preventive measures in this population.

OP240
OBSERVATION OF INTERSCALENE INJECTIONS BY ULTRASOUND-GUIDED FOR CERVICAL PAIN ON CERVICAL VERTIGO

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Introduction Cervical vertigo (CV) is a controversial entity. While it seems to be attributed to a disturbed cervical proprioception and is associated with cervical pain (CP). It is assumed to respond to a treatment that improves CP. In a prospective observational study, we examined whether a treatment originally devised for patients with CP could improve CV.
Purpose To observe the therapeutic effects of interscalene injections by ultrasound-guided for CP on CV.
Method Forty patients with CV were randomized divided into a treatment group (20 cases) and a control group (20 cases). The two groups received conventional therapy, that include ameliorate circulation drugs psychological treatment. During this period treatment group were treated with interscalene injections by ultrasound-guided. The changes of Cervical Sympathetic Symptoms Evaluation Questionnaire (CSSEQ) scores before and after 2 weeks treatment were recorded, and in the treatment group the subjective perception after injections were recorded, the improvement of the symptoms of vertigo, the onset time and disappearance time were observed.
Results Comparison of CSSEQ before treatment,there was no significant difference between the two group ($P>0.05$), after treatment, CSSEQ scores of the treatment group are (5.26±2.47), CSSEQ scores of the control group are (12.84±3.71), and comparison of CSSEQ scores before and after treatment, there was significant difference in every group ($P<0.05$), but the treatment group was significantly descended more than the control group ($P<0.05$); in the treatment group all the patients fell swell and fever on their neck and shoulder, and their upper limb are numbness, fatigue. 18 cases of patients fell their brain lightening and see things clearly. the onset time of the vertigo improvement in the treatment group is (4.0±1.5h), and the disappearance time of the vertigo improvement in the treatment group is (5.0±1.5d).
Discussion and conclusions Accurate positioning of interscalene injections by ultrasound-guided for the treatment of CV has certain efficacy, eliminating CP is the key to treat CV.

OP241
PHYSICAL AND REHABILITATION MEDICINE INTERVENTION IN AN INTERNAL MEDICINE DEPARTMENT – RETROSPECTIVE STUDY OF SIX MONTH PERIOD

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Introduction Internal Medicine (IM), as a hospital specialty, deal with the prevention, diagnosis, and treatment of patients who have undifferentiated or multi-system disease processes. IM has an integrated view of physiological and pathological characteristics of the patient and can treat him as a whole. Physical and rehabilitation medicine (PRM) is a medical specialty concerned with diagnosis, evaluation and management of persons with physical and/or cognitive impairment and disability. Therefore, PRM can deal with IM patient to aim his rehabilitation, according to its potential.
Purpose Characterization of patient population hospitalized in an IM department, with 90 beds, that were evaluated by PRM, in a period of six months.
Method We conducted a retrospective study of patients admitted in an IM service between January 1 and June 30, 2015 and that were evaluated by PRR. A database was made in Microsoft Office Excel® by consultation of electronic patient process. They were characterized according to gender, age, primary diagnosis that led to the intervention of PRM, type of intervention and post-discharge orientation.
Results We evaluated 210 patients (8% of all admissions), with an average age of 79 (± 12) years, 54% were male and 46 % female. The neurovascular (44.3%) and respiratory (43.8%) pathology were the most frequently diseases that required intervention by PRM. Of all patients, 85.7% initiated treatment in some valence of PRM and 41.9 % were oriented to continuing the rehabilitation program after discharge.
Discussion and conclusions The PRM intervention in IM patients is essential, with the implementation of functional rehabilitation program suited to the patient's potential, in order to reestablish their prior independence status. Thus, it is important arrange action protocols between IM and PRM, with integrated rehabilitation teams in the IM department, to get earlier treatment, better guidance and better social and family integration of all patients.

OP242
INFLUENCE OF CERVICAL POSTURE IN THE SEMG SIGNAL IN LUMBAR FLEXION RELAXATION PHENOMENON (FRP)

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Introduction FRP consists in lumbar muscle electromyographic silence while maximal lumbar forward flexion (MLF) is reached. There are several criteria and ratios to establish its presence. Previous studies suggest that posture during flexion-relaxation test (FRT) can influence sEMG signals. Nevertheless there is no clear evidence of how some postural changes can affect the FRP.
Purpose To compare the parameters obtained in FRT performed in the same patient in two different cervical positions (maximal flexion (MCF) and extension (MCE)).
Method Prospective study. Ten patients with lumbar pain (age 47.7+/-10,77; 2 men; 8 women). Informated consent was obtained. FRT was performed according to Watson and Nebblet protocol, in maximal cervical flexion and then in cervical extension.
Material MegaelectronicsLTD sEMG. 2D videoanalysis system. Variables: The average of MLF, Root Mean Square sEMG for each phase of the FRT, and BP/MFV, F/MFV, E/MFV and F/E ratios. Presence FRR was also evaluated according to established criteria. Statistics: Descriptive analysis. Non parametric two-related sample test using Wilcoxon and McNemar statistics. Significane level $p<0,05$.
Results In the MCE test, sEMG signal raised during flexion ($p=0,009$) and MVF ($p=0,013$), and decreased during extension ($p=0,005$). All ratios changed ($p<0,05$). The presence or absence of the FRF was modified in only MFV≤ST criterion ($p=0,031$).
Discussion and conclusions The cervical position may influence in FRT parameters. This effect seems to be lower when FRP criteria is applied. Cervical position should be controlled during FRT.

OP243
WHICH MECHANISMS INVOLVED IN EXTERNAL ANAL SPHINCTER ASYMMETRY ARE ENCOUNTERED IN FECAL INCONTINENCE?

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Introduction: Fecal incontinence (FI) involves 5% of the population and has a severe impact on quality of life. 3D High resolution anorectal manometry (3D-HRARM) is a recent examination allowing precise external anal sphincter (EAS) analysis.
Purpose: Our purpose was to clarify the etiologies of manometric asymmetry EAS behavior in neurologic and anatomic FI.
Methods: 3D-HRARM was performed in 33 female patients with FI and 39 healthy female subjects. Patients also had endo-anal ultrasonography, perineal electroneuromyography (ENMG) and rectoscopy. A motor index was calculated for each hemi-EAS at rest and during squeeze. Right-left EAS asymmetry was defined with relevant visual thresholds interpreting the 3D-HRARM.
Results:The two groups were comparable. Right and left hemi-circumference motor index were significantly lower in patients compared to healthy subjects (p=1.10-4). The frequency of asymmetric motor index was comparable between patients with FI and healthy subjects at rest (49% vs 49% p=1) and during squeeze (49% vs 64% p=0.23). Right-left asymmetry was not significantly correlated with a lesion lateralized in the internal (p=0.17) or external (p=0.71) anal sphincter, with rectal intraductal prolapse (p=0.6), or with elongated unilateral pudendal terminal motor latency (p=0.11). Poor motor unit potential recruitment was significantly associated with weaker motor index during rest (47 mmHg vs 112 mmHg p=0.0024) and squeeze (729 vs 1023 p<0.05). Moreover, amplitude (p=0.01), number of phases (p=0.04), and area (p=0.04) were higher in the weaker sphincter using the motor index at squeeze.
Discussion and conclusions: Right-left EAS asymmetry is as frequent in healthy subjects as in patients, and does not seem to be explained by either anatomic or neurologic lesion, or rectal intraductal prolapse. The ENMG results suggest that reinnervation could be involved in asymmetry.

OP244
IMPACT OF NEUROGENIC BOWEL DYSFUNCTION IN QUALITY OF LIFE AFTER SPINAL CORD INJURY

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Introduction: Neurogenic bowel dysfunction (NBD) is common after spinal cord injury(SCI) and it's a major cause of morbidity. Its prevalence, severity and impact on quality of life (QoL) is understudied.
Purpose: To describe bowel management (BM), prevalence of NBD and its impact on QoL in SCI patients.
Method: Retrospective data analysis and cross-sectional phone survey of SCI patients admitted for inpatient rehabilitation program between 2008 and 2010, with clinical files available. Variables assessed: current BM, NBD Score, Likert scale questionnaire about the impact in ICF domains and QoL.
Results: 51 patients out of 75 (68%) answered to the questionnaire. The majority were male(64.7%), mean age 56.6±15.5 years, classified as AIS A lesion (39.2%), from traumatic cause (70.6%), and mean time since injury 7.1±2.2 years. The main BM at last hospitalization were contact laxatives (64.0%), suppository (61.3%) and osmotic laxatives (50.7%); 21.3% reported normal bowel function. 58.8% reported changes in BM since discharge. 35.3% reported normal bowel function. The main current BM were suppository (47.1%) and contact laxatives(41.2%), there was a higher use of suppository (13.7%) and micro-enema (11.8%) on irregular basis. Moderate or severe NBD were present in 53.0% patients. Considering ICF domains, 21.5% reported major impact in social life, 25.5% in financial costs, 39.2% in need of assistance, 31.4% reported anxiety or depression and 35.3% loss of autonomy. 53.0% reported major impact of NBD in QoL.There was a significant association between severity of NBD and negative impact in QoL($p<0.05$).
Discussion and conclusions: This study confirms major impact of NDB in QoL after SCI and analyses its influence on ICF domains. The use of irregular methods points to noncompliance of medical prescription after discharge, with tendency for more severe NBD. In addition to medical treatment, some aspects of ICF may require other kind of interventions.

OP245
DO URINARY SYMPTOMS CORRELATE WITH URODYNAMIC FINDINGS IN MULTIPLE SCLEROSIS?

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Introduction: Multiple sclerosis (MS) is a chronic, inflammatory and demyelinating disease of the central nervous system. Urinary symptoms are present in most patients in the course of their disease. It is therefore important to evaluate the association between specific urinary symptoms and urodynamic observations in MS.
Purpose: This study aims to evaluate the association between urinary symptoms in MS and urodynamic observations.
Method: We assessed 100 urodynamic studies of 80 patients, performed between 2008 and 2015. Two patients had other neurological diseases and were excluded. The tests conducted were uroflowmetry, cystometry, urethral profilometry and perineal electromyography.
Results: The patients were mostly female (60%) with a mean age of 46 years. The most common symptoms were urgency (52.6%), feeling of incomplete emptying (17.9%), hesitancy (16.7%), urge incontinence (14.1 %) and intermittent stream (9.0%). The most frequent observations were non-specific changes of bladder sensation (52%), detrusor overactivity (47%) and decreased bladder compliance (34%). Urge incontinence was associated with a decreased bladder capacity ($P < 0.05$) and increased bladder sensation ($P < 0.05$). Intermittent stream was associated with increased urethral pressure ($P < 0.005$) and increased post void residual ($P < 0.05$). Hesitancy was associated with increased urethral pressure ($P < 0.05$), detrusor sphincter dyssynergia ($P < 0.05$) and decreased bladder compliance ($P < 0.05$). All other urinary symptoms were not associated with any specific urodynamic observations.
Conclusions: Common symptoms such as urgency and feeling of incomplete emptying were not associated with any urodynamic observation. Also, detrusor overactivity, one of the most frequent observations, was not associated with any specific symptom. This study suggests the interest of urodynamic monitoring in MS, since the symptoms may not be sufficient to identify urethral and bladder disorders, in order to properly guide the treatment.

OP246
MODERN APPROACHES TO CORRECTING CONTRACTILE FUNCTION OF THE RECTUM SPHINCTER

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Introduction: Treatment and rehabilitation of patients with faecal incontinence has great medical and social importance, since this pathology leads to a significant deterioration in the quality of life, reduced activity, a change in the emotional sphere of patients.
Purpose: To evaluate the effectiveness of comprehensive rehabilitation programs for patients with fecal incontinence.
Method: All patients we observed were divided into 2 groups: control group (CG), which included 11 people who were on the standard treatment with hardware complex «UROSTYM», without using additional treatments.Main Group (MG), which included 17 people were on treatment with hardware complex «UROSTYM» together with the magnetic and electric stimulation.
All patients before and after treatment were surveyed Wexner scale, in order to assess the quality of life and severity of anal incontinence, as well as the diagnosis of anal sphincter contraction forces on hardware complex «UROSTYM».Treatment was administered daily from day 1 to 10: in CG using the appliance «UROSTYM» with biofeedback.In the MG using 3 hardware systems: «UROSTYM» - BOS, dual pacemaker «Cefar Peristim Pro» and electromagnetic stimulation on hardware complex «BIOCON-2000W».
Results: The results of the pilot survey on the Wexner scale and diagnostics on hardware complex «UROSTYM» was found: in both groups - the positive dynamics in the form of increasing the compression force of the anal sphincter and reducing the number of episodes of anal incontinence.The results of treatment of patients in comparison with the MG and CG was considerably higher. In the MG 15 patients achieved complete disappearance of anal incontinence episodes, whereas in the CG receiving conventional treatment, this effect was achieved only 3 patients.
Discussion and conclusions: Implementation of comprehensive rehabilitation with biofeedback - technology is an effective treatment of fecal incontinence.

OP247
THE EFFECTIVENES OF PHYSICAL THERAPY ON PELVIC FLOOR MUSCLE ACTIVITY

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Introduction. Pelvic floor dysfunction is a complex and widespread problem among male and female. The major disorders of pelvic floor are urinary and fecal incontinence, constipation. These problems are most often caused by weak pelvic floor muscles. Therefore, it is important to assess the functional status of pelvic floor muscles and train these muscles to restore their strength, speed and endurance.
Purpose. To evaluate the effectiveness of physical therapy on pelvic floor muscle activity for patients with pelvic floor dysfunction, both in the short and in the long terms.
Method. Forty nine patients aged 39–80 (mean 63.14±11.3 years) with pelvic floor dysfunction were included in the study. All patients performed physical therapy five times per week for 2 weeks and continued exercises at home for two months. Subjects pelvic floor muscle activity was assessed by apparatus "Enraf Nonius" Myomed 632V before and after physical therapy and after two months of home program.
Results. The change between the maximum and average muscle contraction before and after physical therapy differed significantly ($p<0.05$). The variation between the maximum and average muscle contraction and the minimum and average muscle relaxation after physical therapy and in remote period remained unchanged. After physical therapy and in remote period the quality of life for patients with pelvic floor dysfunction improved significantly ($p<0.05$). A strong statistical correlation was found between the variation between the maximum and average muscle contraction and the physical activity in the past ($r=0.9$, $p<0.05$).
Discussion and conclusions. The study results highlight the importance of physical therapy for the improvement of pelvic floor muscle activity. However further randomized controlled studies are necessary to validate the success of physical therapy intervention.

OP248
A STUDY OF BLADDER DYSFUNCTION IN DIABETES MELLITUS

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Introduction and purpose: Diabetic cystopathy was initially described as a complication of diabetes, characterized by an increase in bladder capacity and in post voiding residual volumes, accompanied by decreased bladder contraction and sensation. Today, the term includes symptoms of overactive bladder, urgency associated with or without incontinence, urinary frequency and nocturia.The purpose of our study was to investigate the prevalence of bladder dysfunction symptoms and its relation with other complications of diabetes, duration of disease and type of diabetes.
Method: An inquiry of urinary symptoms was done to the diabetic patients followed in our hospital, being excluded patients with other comorbidities eventually responsible for cystopathy. We also evaluated the impact of symptoms on the daily basis. From a number of 400 patients, 151 were included in our study. A similar number of a control healthy population was inquired, respecting the same protocol.
Results: From the 151 patients evaluated, 76 were female and 75 were male. Our population included 52 DM1 and 99 DM2 patients, with an average of HbA1c: 8.14% and of 15 years of diabetes duration. 64/151(42%) of patients had more than one diabetes chronic complication and 35/151(23%) had symptoms of stress urinary incontinence. 114/151(75%) patients had more than one symptom of bladder dysfunction on the storage phase and 53/151(35%) had symptoms of voiding dysfunction, with only 28 patients with no symptoms of urinary dysfunction. The impact of the urinary symptoms on their daily basis was, on average, 7 on a scale of 0-10.
Discussion and conclusions: Diabetic cystopathy is a highly prevalent complication. For a correct evaluation of this pathology, many vesico-urethral dysfunction causes must be ruled out; a good clinical history with an inquiry of urinary symptoms help to characterize the disease stage. The characterization of overactive or hypotonic phases is decisive for the choice of therapeutic strategy.

OP249
PERCUTANEOUS TIBIAL NERVE STIMULATION (PTNS) IN THE TREATMENT OF OVERACTIVE BLADDER RESULTS AND FOLLOW UP

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Introduction: Overactive bladder (OAB) is a chronic condition that impairs quality of life of those affected. Neuromodulation is an effective and safe treatment option. Percutaneous tibial nerve stimulation (PTNS) is a peripheral neuromodulation technique, in which posterior Tibial nerve is electrically stimulated. This stimulation modulates the sacral nerve plexus through the S4-S5 nerves. Despite the lack of certainty about the mechanism of action of PTNS, in the last decade this technique has been widely used for the treatment of OAB.
Objective: To investigate the effect of percutaneous posterior tibial nerve stimulation (PTNS) twelve weeks program on OAB symptoms and health related quality of life
Methods: 17 patients (16 females), diagnosed of OAB non respondents to conservative therapies were selected. All patients were treated with PTNS. A 34-gauge needle electrode was inserted 5cm cephalad to the medial malleolus. Nerve stimulation at a current level of 0,5-9mA at 20 Hz was performed for 30 minutes weekly during 12 weeks. Urinary symptoms, overactive bladder and quality of life questionnaires (Sandvick, ICIQ-SF, OAB 8, PISQ-12) were completed at 6th, 10th, 12th sessions and at 1st, 3rd month after treatment. Analysis was performed using the SPSS version 16.0. To determine the effect of treatment a Wilcoxon test was used. A p value of <0.05 or 95% confidence interval was considered to indicate a statistically significant difference.
Results: A significant improvement until the 3rd month after treatment was observed in Sandvick, OAB 8 and ICIQ-SF. Nocturia significant decrease was showed until the 12th session. No significant difference in voids per day and in episodes of leakage was observed. PISQ-12 showed improvements but without statistical relevance.
Conclusions: PTNS is an effective treatment for patients with OAB syndrome non responding to conservative therapies.

OP250
ASSESSING NEUROMUSCULOSKELETAL AND MOVEMENT-RELATED FUNCTIONS AND IMPAIRMENT IN PATIENTS WITH SPASTICITY: A REVIEW OF OUTCOME MEASURES

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Introduction: An impairment such as spasticity greatly influences neuromusculoskeletal and movement-related functions. Standardised methods for assessing these changes are essential in order to compare the efficacy of different interventions and therapies. However, there is currently no consensus on how best to evaluate spasticity-related clinical and functional outcomes. This study describes the development of recommendations on outcome measures concerning spasticity and its influence on functions.
Purpose: To identify the range of clinical and functional outcome measures used in interventional and observational studies of patients with spasticity. The results will be used to inform clinicians about the most appropriate outcome measures.
Methods: A targeted literature review searching the MedLine, Embase and Cochrane databases from 1995 to 2015. Studies were included if they involved ≥10 patients and reported clinical or functional outcome measures in patients with spasticity. Details of patient population and measures used in each study were extracted and the number of studies using each measure was tabulated by indication. Measures occurring in <3 studies were excluded from further analysis.
Results: Sixty outcome measures occurred ≥3 times in the 399 studies included. Diagnoses were varied, 2 studies (<1%) were in ALS, 121 (30%) in CP, 19 (5%) in MS, 21 (5%) in SCI, 161 (40%) in stroke, 6 (1%) in brain injury and the remainder in mixed/unspecified populations. Spasticity was most frequently evaluated using the Modified Ashworth Scale but 7 other measures were also used. Commonly used measures for functioning included general measures of disability and functional performance measures related to ambulation and to use of the upper limb. Condition-specific impairment scales were less frequently used.
Discussion and conclusions: A wide range of outcome measures are currently in use. However, not many of them measure the direct effect of spasticity on function. Further analysis is required to recommend the appropriate outcome measures.

OP251
INTEGRATED REHABILITATION TREATMENT OF FOCAL SPASTICITY AFTER BOTOX INJECTION

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Introduction The management of focal spasticity is very expensive and there is an urgent need to identify the best eligible treatment. The literature in the last decade supported the superiority in terms of efficacy and safety of botulinum toxin compared to traditional spasmolytic drugs. Many authors emphasize the combination of treatment with botulinum toxin type A (BTX-A) and physiotherapy treatments (FKT) to implement the algorithm of treating spastic hypertonia and increase the effectiveness of the toxin.
Purpose Aim of this study was to compare the effectiveness of the administration of botulinum toxin type A with the administration of botulinum toxin type A combined to a specific rehabilitation protocol in patients with focal spasticity of the upper limb after stroke.
Method 47 patients were enrolled and divided randomly into two groups (Group A, which performed BTX-A injection and a specific outpatient rehabilitation program and Group B which performed BTX-A injection and home rehabilitation). Each subject was assessed by: rating scales specific for spasticity (Modified Ashworth Scale, Scale Tardieu to V3, test Bahkta), measurement of ROM joints involved, VAS pain scale of the muscles involved, Functional Independence Measure (FIM).
Results Results at 1, 3, 6 and 12 months follow up showed a significant change in the spasticity rate ($p<0.05$) and functioning ($p<0.01$), only in Group A which made the specific outpatient rehabilitation program with a lengthening of the results which allowed to to extend the interval between one injection and the next.
Discussion and conclusions The data collected in the study show that considering the temporary nature of the therapy becomes necessary a careful management with specific rehabilitation in the months after inoculation, to optimize the results in terms of reduction of spasticity and associated pain and increase performance improving the patient's autonomy in daily activities and quality of life.

OP252
THE RESTLESS LEG SYNDROM, DIFFERENTIAL DIAGNOSIS OF SPASTICITY IN THE POPULATION OF SPINAL CORD INJURY

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Introduction: Restless syndrome (RLS) is a sensorimotor disorder characterized by an urgent need to move the limbs, associated with unpleasant feelings, painful during early night. Periodic leg movements (PLM) may be attached during sleep, characterized by an extension movement of the hallux, dorsiflexion of the ankle and sometimes knee flexion and hip. The pathophysiology of RLS is not fully understood. In the literature, studies have shown an increased prevalence of RLS in patients with Spinal cord Injury (SCI) or Multiple Sclerosis (MS).
Objective: To diagnose spasticity or RLS in patients complaining of repeated nocturnal spasms initially addressed in consultation because of spasticity resisting to pharmacological treatment.
Method: Prospective study, from March 2014 to June 2015, monocentric, in MPR Service Hospital Raymond Poincaré. Inclusion criteria: age over 18 years, SCI, MS patients, with nocturnal predominance spasms. Exclusion criteria: presence of pressure sores, unable to achieve a polysomnogram. Weekday hospital patients for predominantly nocturnal spasms resistant to pharmacological treatment of spasticity orally or even to intrathecal therapy baclofen, associated with sleep disorders, enjoyed a polysomnography. If RLS existed, 0.18 mg of pramipexole was administered to patients, followed by a control polysomnography.
Results: 18 patients: 7 (MP), 11 (SCI) were included. All had polysomnography for a RLS. All of them had, during the medical examination, 4 main criterias of RLS & 16 of the PLM of the polysomnography record. A significant improvement was experienced on 10 patients, with a important reduction (PLM) on polysomnography control, after administration of pramipexole.
Conclusion: This pilot study shows that RLS may be a differential diagnosis of spasticity. The presence of spasms with predominance nocturnal or during supine position, in patients with type of central nervous system lesions (SCI) or (MS) has to search for RLS and test the effect of dopamine agonists in case of positive diagnosis.

OP253
THERAPEUTIC BENEFIT OF BOTULINUM TOXIN A FOR THE SPASTICITY OF THE TRICEPS SURAE IN PATIENTS WITH MULTIPLE SCLEROSIS: PRELIMINARY RESULTS

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Introduction Few data are available on the use of botulinum toxin for spasticity treatment in multiple sclerosis. In a previous study we found that one of the main therapeutic goal was the improvement ok walking, in patients suffering from spasticity of the triceps surae.
Objective : This is a pilot observational study, with the aim to assess the benefit of an injection of 200 UI of incobotulinumtoxinA in multiple sclerosis patients
Method This study concern patient with multiple sclerosis with EDSS score lower than 6.5, needing botulinum toxin for focal spasticity of the triceps surae. The last injection, if the patient had previous botulinum treatment must be performed more than 3 months later. Outcome measures were Goal Attainment Scale, MSWS-12 scale, TUG, 6mn Walk, and Gaitrite evaluation before , 6 weeks and 3 months after the injection. Treatment consist of 200 UI of incobotulinumtoxinA injected in the triceps surae in 5 points according the anatomic technic, with a dilution of 100U in 3 ml. This study was approved by the local ethic comity of the University Hospital of Rennes (France)
Results We present the result of 18 patients, with a mean age of 46.7 +/-11 years , and a mean EDSS of 4.2 .6 weeks after the injection we observed a significant improvement for the GAS, the MSWS-12 score (p=0.037), and the TUG (p=0.003). 6mnWT was improved but not significantly (p=0.09). At 3 month TUG was still improved but not significantly (p=0.056), 6mnWT was significantly increase (0.0241). 80% of the patient had reached their objective on the GAS.
Conclusions This are just preliminary results, but they tend to confirm the interest of the botulinum toxin for the treatment of focal spasticity of the triceps surae with a significant improvement of gait and posture. Further studies are needed to confirm the place of botulinum toxin in this indication. Our results are in concordance with the French recommendations about focal spasticity treatment. Botulinum toxin should probably discussed early in the management of spasticity in MS patients

OP254
TREATMENT WITH INCOBOTULINUMTOXINA (XEOMIN) IN MOVEMENT DISORDERS: THE 'TIM STUDY FAMILY' IN PEDIATRIC NEUROLOGY

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Introduction: Expert consensus recommends Botulinum neurotoxin (BoNT) treatment for pediatric upper-limb (UL) and/or lower-limb (LL) spasticity due to cerebral palsy (CP). Studies reflecting patients' need for long-term, repeated BoNT treatments are lacking.
Purpose: To evaluate incobotulinumtoxinA (Xeomin) as a valuable option for long-term multilevel treatment of children with CP.
Method: The program encompasses 3 multinational studies in children/adolescents (2-17 years) with spasticity due to CP. TIM is a double-blind study focused on LL spasticity (NCT01893411). Subjects are randomized into incobotulinumtoxinA dose groups (16, 12, or 4U/kg body weight [BW]; ≤400U total) for 2 treatments, each followed by 12-36 weeks' observation. Upon completion, subjects are eligible for TIMO, a long-term safety study (4 treatments, 12-16-week intervals; NCT01905683) that also includes subjects with combined UL/LL spasticity. XARA (NCT02002884), a randomized, double-blind study (8, 6, or 2U/kg BW per treated UL; ≤20U/kg BW total; ≤500U total) with open-label extension (3 treatments, 12-16-week intervals), addresses UL or combined UL/LL spasticity. Across all studies, total dose is distributed according to individual needs, focusing on one pre-defined main activity pattern. Injection guidance (ultrasound/electromyography/e-Stim) is mandatory.
Results: These studies are currently ongoing. Primary outcomes include changes in muscle tone (Ashworth Scale) of the main activity pattern in TIM and XARA, and safety in TIMO. Several patient-rated outcome measures are also evaluated.
Discussion and conclusions: These studies will improve our knowledge of BoNT treatment for children with CP, placing patients' needs top priority (AAA): Adequate dosage (no placebo), Accurate (guided) injection, Activity pattern (no fixed muscle injection regimen).

OP255
HOW FLEXIBLE INFUSION MODE IN ITB THERAPY CAN HELP MANAGE SPASTICITY FLUCTUATIONS IN UMNS PATIENTS

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Introduction: generalized spasticity is a dynamic condition with fluctuating symptoms that changes related to posture, circadian rhythm, pain and infections. Even if the simple continuous infusion mode is the most used in intrathecal baclofen (ITB) therapy, flexible dosages to treat generalized spasticity in UMNS may improve tailored dosages and clinical outcomes, address dose escalation and manage different spasticity patterns.
Purpose: we investigate clinical practice (continuous versus complex infusion modes) to manage generalized spasticity, and how optimizing the infusion mode can help further improve the efficacy of ITB therapy.
Method: 35 ITB patients implanted in our center will be retrospectively analyzed during last ten years and any change in infusion mode will be recorded for each patient. Then clinical problems and functional outcomes related to changes in infusion mode, onset time from implant and the percentages of patients with simple continuous, flex, flex and bolus, or bolus will be observed.
Results: a database has been designed and tested, and data collection of the last ten years started in September 2015. Preliminary results state that around 30% of our patients are in flexible infusion mode: all these patients have been implanted in the last 3 years.
Discussion and conclusions: Increasing our experience in ITB for generalized spasticity, we gradually tested and validated the efficacy of moving from simple continuous to flexible infusion modes in managing generalized spasticity fluctuations and optimizing the daily dose. We'd like to start an Italian national database to stimulate the discussion about how to plan the adoption of the different infusion modes.

OP256
EFFICACY OF BONT-A INJECTIONS ON GAIT SPEED IN CHRONIC SPASTIC STROKE PATIENTS - A RETROSPECTIVE STUDY

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Introduction: Spasticity affects approximately 40% of stroke survivors. Botulinum neurotoxin A (BoNT-A) reduces lower limb spasticity but its role in improving walking ability remains to be established.
Purpose: The aim of the present study was to investigate the effectiveness of BoNT-A applied to several lower limb spastic muscles on gait improvement of chronic stroke patients.
Method: We conducted a retrospective survey of 21 chronic stroke patients tested at the baseline, 1-1.5 and 3-5 months after BoNT-A administration in lower limb muscles. In each evaluation range of motion and muscle tone (Modified Ashworth Scale) were measured in the lower limb, as well as gait speed through the 10 Meter Walk Test (10MWT).
Results: There was a 16% decrease in spasticity at 1-1.5 months after the application of BoNT-A and a 17% increase at 3-5 months, maintaining a 2% improvement towards the baseline evaluation. Gait speed increased from 0.26m/s to 0.31m/s after 1-1.5 months and significantly decreased to 0.28m/s in the evaluation of 3-5 months ($p<0.000$). The decrease of muscle tone over time correlates moderately with the gait speed measured by 10MWT (CC=0.523). In patients with sural tricipital muscles BoNT-A application, the range of motion of ankle dorsiflexion improved significantly from a deficit of 10° to 0° at 1-1.5 months and 5º at 3-5 months ($p=0.028$). Participation in a rehabilitation program during the first month (n=13) correlates with greater decrease in tone (CC=0.183) and increased gait speed (CC=0.103).
Discussion and conclusions: According to our study a meaningful improvement in walking performance can be obtained in chronic spastic stroke patients after BoNT-A injection into several lower limb muscles. However, this is a small sample which is not representative of the population. Thus, we identify the need for further well-designed randomized, controlled, clinical trials to establish solid scientific evidence.

OP257
BOTULINUM TOXIN IN THE TREATMENT OF FOCAL SPASTICITY – A CASE SERIES

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Introduction: Botulinum toxin (BoNT) has been consistently used for the treatment of focal spasticity following stroke. However questions surrounding its outcome measures still subsist.
Purpose: To present a case series of patients with focal spasticity treated using BoNT approached on the basis of the International Classification of Functioning, Disability and Health (ICF).
Method: Retrospective analysis of 9 stroke outpatients with focal spasticity was performed, regarding their body functions and structures (Modified Ashworth Scale (MAS), Pain through Visual Analogic Scale (VAS)), Activity (Activities of Day Living – Barthel Index; Frenchay Arm Test (FAT), Disability Assessment Scale (DAS); Timed Up and Go (TUG), 10 meters walking test (10mWT), video recording of gait, and Participation (Stroke Specific Quality of Life Scale, (SSQUOL). Patients were evaluated immediately before the administration of BoNT and 4 to 6 weeks after treatment.
Results: 9 patients received treatment with different doses and muscles injected, according to previous evaluation and elected goals. MAS improved 1 to 2 degrees in general. Pain related to spasticity at rest VASrest-5,0 and in activity VASact-5,0 improved after treatment to VASrest- 1,0 and VASact-3,4. There was little difference in the DAS: 5,6 -> 4,0 and FAT 1,5 -> 1,1. Regarding the balance and gait speed evaluation there was no significant overall difference (TUG: 44,5s -> 42s and 10mWT:40,5s->43,8). Simple analysis of the video recording of gait showed improvements in some patient's gait pattern. Barthel index stayed the same (80,0->80,5). SSQuol also was similar (3,13->3,25). Nevertheless initial goals were attained at least partially in most patients.
Discussion and conclusions: Treatment of focal spasticity using BoNT should be individualized and its success should be based on the attainment of initial goals.

OP258
FUNCTIONAL PERFORMANCE IN FUTSAL PLAYERS WITH HISTORY OF ANKLE SPRAIN

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Introduction: Ankle sprain is one of the most common sport injuries. Contrasting findings have been reported regarding the presence of functional deficits after an episode of ankle sprain.
Purpose: To assess the functional performance in futsal (a version of five-a-side football) players with history of ankle sprain compared with futsal players in a control group.
Method: Eight-three male futsal players (26.6 ± 5.1 years old) from seven amateur clubs were recruited for this case-control study. Players were divided into two groups: a group with ankle sprain history (n = 30) and a group without history of ankle sprain (n = 53). Functional performance was assessed by measuring agility (T-test), velocity (30 meters sprint), flexibility (sit and reach) and vertical jump performance (squat jump). Independent t-tests were performed to compare mean differences among groups.
Results: No significant differences were observed between the group with and without history of ankle sprain in age (25.7 ± 4.6 vs. 27.1 ± 5.4 years old, p=0.330), weight (74.4 ± 9.7 vs. 75.9 ± 9.9 kg, p=0.530) and body mass index (23.8 ± 2.3 vs. 24.6 ± 2.6 kg/m^2, p=0.180). No difference was found between participants with and without history of ankle sprain for velocity (4.2 ± 0.3 vs. 4.3 ± 0.3 s, p=0.829), agility (11.2 ± 1.1 vs. 11.2 ± 0.9 s, p=0.880), flexibility (6.4 ± 8.1 vs. 8.2 ± 7.1 cm, p=0.294) and vertical jump performance (36.0 ± 5.9 vs. 35.9 ± 5.7 cm, p=0.891).
Discussion and conclusions: Futsal players with history of ankle sprain fully recovered showed no functional performance deficits compared to players without history of ankle sprain.

OP259
KNEE MUSCULOSKELETAL INJURIES CAN BE PREDICTED BY ISOKINETIC ASSESSMENT OF SOCCER PLAYERS

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Introduction: Soccer players frequently face the occurrence of musculoskeletal injuries due to direct contact or athletic movement overload. However, it is not clear how much of or individual training abilities may interfere in these events.
Purpose: to explore if pre-season knee isokinetic findings may predict musculoskeletal injuries in lower limbs of professional soccer players
Method: This is a cohort observational study with professional male soccer players recruited from 2 teams. Knee isokinetic dynamometry consisted of 5 concentric repetitions for extensors and flexors at 60 degrees/second after 10 minutes of warming and 3 familiarization repetitions. Knee flexors/extensor peak tork relation was considered normal between 50% and 70%, otherwise a risck factor. The incidence of musculoskeletal injuries was defined by impairments which prevented training or competitive play and were diagnosed and informed by medical departments of both teams.
Results: 68 athletes (18-24yo) were followed for one year after pre-season assessment. The group with normal flexors/extensor relation had 38 athletes and there were 12 injuries (8 knee ligaments ruptures and 4 muscle sprains), while the other 30 athletes presented with 12 injuries (3 knee ligaments ruptures and 9 muscle sprains). Relative risk for injuries in the exposed group was 1.27 (95%CI 1.13 – 1.40) and for muscle sprains was 2.85 (95%CI 2.30 – 3.40).
Discussion and conclusions: The quadriceps and hamstring muscle tork define the force regimen in the knee and seem to be involved in the occurrence of non contact muscle injuries in the thigh in professional soccer players. These results may guide training and preparation of the athletes for competitive play.

OP260
REHABILITATION OF TIBIAL STRESS FRACTURES IN RUNNERS

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Introduction: stress fractures represent approximately 10% of injuries seen by sports medicine specialists. The most common type of stress fracture of the lower extremity involves the tibia accounting for 49 % of total cases .
Purpose: to review literature on rehabilitation after tibial stress fracture in runner
Methods: we searched for tibial stress fractures and rehabilitation on Pubmed-medline, Scopus and Atoz.
Results: Tibial fractures affecting the postero-medial cortex are considered low-risk. They are treated conservatively through a rehabilitation programme divided in two phases. During the first phase the patient is allowed to weight bearing as tolerated by pain. The patient may also perform low impact activities directed at maintaining cardiovascular performance, such as deep water running, anti-gravity treadmill and swimming. The second phase involves muscular strengthening and endurance exercises , proprioceptive training, flexibility exercises and gait retraining. During this phase running is re-introduced and progression in training is made. The use of a pneumatic brace may aid the rehabilitation process. Tibial fractures affecting the anterior cortex are considered high risk and therefore are usually treated surgically through intramedullary nailing or tension band plating. Partial weight bearing is recommended during 6 weeks with progression to full weight bearing as tolerated by pain thereafter. The use of shock absorbing foot inserts in sportswear has been to suggested to reduce the risk of stress fractures.
Discussion and conclusions: The design of current rehabilitation programmes after tibial stress fractures comes mostly from clinical cases and limited retrospective studies. There is a need for well conducted studies on interventions for treatment and prevention of tibial stress fractures.

OP261
INJURIES ON WHEELCHAIR BASKETBALL PLAYERS - A QUALITATIVE STUDY

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Introduction: Wheelchair basketball is considered one of the major disability sports practised. In the last years this sport has grown worldwide accompanied by technical developments and increased number of players. It's an important tool in the rehabilitation of people with chronic disabilities, presenting several benefits such as improved coordination, trunk balance, flexibility, muscle strength and cardiopulmonary function. However, high incidence of upper limbs injuries in these athletes have been documented during sports practice.
Purpose: To assess medical history and identify the most frequent injuries experienced in athletes who compete in wheelchair basketball and how this affect their performance.
Methods: Qualitative study through interviews with close ended questions made by the authors to wheelchair basketball players who participated in the state championship last season (2014-2015).
Results: Evaluation of a championship team, all male, the majority with spinal cord injuries, training twice a week. Pain complaint was present in all of these athletes at least one time, being mostly localized in the upper extremity. Among the injuries, sprains and strains of metacarpophalangeal joints were the acute injuries most reported and tendinitis were the overuse injuries mostly described. Depending on the lesion, athletes had to leave for some period the competition. Other problems, such as pressure ulcers and urinary tract infections were also responsible for temporary withdrawal from sports practice.
Discussion and conclusions: This investigation was consistent with previous research. Despite the number of injuries associated with wheelchair basketball, this sport should be encouraged by the countless benefits and social integration. Therefore, prevention and early treatment of this injuries are necessary to avoid athletes from leaving the competition or interfering with daily life activities.

OP262
MEDICAL DATA TREATMENT LABORATORY LATIM, INSERM UMR 1101, BREST, FRANCE: THE NEURO-MUSCULO-SKELETAL SYSTEM TEAM

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Introduction and purpose: The aim of the Medical data treatment Laboratory (LaTIM, INSERM UMR 1101) is to develop transdisciplinary and translational research to improve health condition. One of the axis of the lab is dedicated to the exploration and treatment of the neuro-musculo-skeletal system in children and adults with motor disabilities.
Methodology: A technological research platform has been developed in Brest grouping the University Hospital of Brest, the Western Britanny University and an engineering school "Telecom Bretagne", all part of the LaTIM. This platform includes for our purposes radiological devices (MRIs, CT-scan, EOS system, Ultrasound,…), motion analysis system (VICON, 9 cameras, force plateforms,), Dynamic EMG system (16 ways). This allow the understanding of how anatomy (especially joint deformities and muscle atrophy) impacts on joint motion and thus on the motor activities of an individual. We are also interested on how motor control, measured using dynamic EMG impacts on motion. Our main populations of interest are adults with stroke, children with cerebral palsy, with neuromuscular disorders and neonatal brachial plexus palsy. The platform is used for the follow up of populations, leading to large databases, and for the evaluation of interventions during clinical trials (e.g botulinum toxin). We have many partnerships in France, Europe and North America.
Results: Since the engineering development is guided by the medical needs the research developed in the LaTIM is very translational and quickly applicable. Each new development of the platform (e.g. new imaging techniques or signal treatment, or new motion capture) leads to new clinical knowledge. In the past 6 years this research led to more than 30 articles in international peer-reviewed journals and more than 100 national and international communications in conference.
Discussion and conclusions: The main publications of the lab will be presented and discussed.

OP263
UNIT OF SPORT MEDICINE RESEARCH ACTIVITIES

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Objective: The aim of our research activities is to improve musculoskeletal disorders' diagnosis and rehabilitation of athletes. Our health interventions are focused on the diagnosis of lesions affecting the musculoskeletal system and the neuromuscular functional assessment in sound athletes and after musculoskeletal injuries.
Research design and methods: the unit of sport medicine is part of the PRM department in the university hospital of Marseille Medical School Aix Marseille university France. We benefit from an interdisciplinary and inter-professional cooperation (PRM and sports medicine specialists, radiologists, orthopedic surgeons, PT). Up to date imaging equipment (MRT, CT scan, US) and isokinetic dynamometer are available, on site.
Results: we have published a series of clinical cases on diagnostic assessment of musculoskeletal lesions, on isokinetic assessment in sound athletes and after lesions. We have developed and validated new methods of muscle rehabilitation using eccentric contraction.

OP264
RESEARCH PROGRAM IN ROTHSCHILD NEURO-ORTHOPEDIC UNIT

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Introduction The Physical Medicine and Rehabilitation Service devoted to rehabilitation for orthopedic and neurologic patients in Rothschild Hospital depends on APHP in Paris and is associated to a Balance and Gait Laboratory linked to CIAMS Paris 11 University.
Methods Research is oriented to biomechanical evaluation of balance in neuromuscular disorders and validation of rehabilitation program in the same field. Main tools correspond to static force platform, experimental dynamic robotized force platform and eye-tracking analysis during gait to evaluate visual compensation
Results Open studies have been performed to characterize the short effects of balance rehabilitation in Myotonic dystrophy (1) and sensory neuropathies (2). These first studies give arguments for a good tolerance to clinical and instrumental evaluation and positive effects of training in a significant part of different parameters. Correlations between static and dynamics parameters of balance and gait do not appear to be strongly related, suggesting a differential evaluation of these parameters when considering the goals of rehabilitation program. A new approach is on duty to characterize the sensory and motor compensation to sensory ataxia during dynamic stability and the effects of a training program in FSH myopathy with a middle-term follow-up.
Discussion and conclusions Neuromuscular disorders are characterized by reduced performances when studying balance and gait. A multisensory approach of these diseases is proposed in our lab and unit to increase the effectiveness of training program oriented with clinical and instrumental parameters in static and dynamic conditions.

OP265
PRM DEPARTMENT PARIS DIDEROT UNIVERSITY, LARIBOISIERE F.WIDAL HOSPITAL, COGNAC-G UNIT

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Purpose: balance recovery after acute lesion of the central nervous system is the main topic of research (along with others on motor control recovery): use of sensory inputs, sensory dependence and sensory reweighting, rehabilitation.
Methods and Tools: Our PRM department is devoted to neurological disorders; instrumental gait and balance analysis: baropodometric mat, sensors, video, force platforms, sensorial manipulations (vision by optokinetic stimulation, vestibular by galvanic stimulation, proprioceptive by tendon vibrations); clinical assessments of gait and balance.
Results: of the studies on balance: Visual dependence is a frequent comportment after stroke, counterproductive for balance which deserves to be detected and counteracted. The early period after stroke is characterised by an excessive sensibility to all sensory inputs and manipulations, and seems to be a crucial period for a new sensory organization (reweighting). These changes are not only related to neurologic impairments but also to previous individual physiological characteristics.
Discussion and conclusions: Our works take place along with others aiming at a better understanding of balance disorders after CNS lesion. It is crucial to be able to know how a subject manages with the different sensory cues in order to design customized rehabilitation programmes for balance and gait. The real impact of sensory dependence and the efficiency of its correction by the mean of physical rehabilitation have to be confirmed.

OP266
THE CLINICAL MOTION ANALYSIS LABORATORY (CMAL) AT THE KU LEUVEN UNIVERSITY HOSPITAL, LEUVEN, BELGIUM

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The Clinical Motion Analysis Laboratory (CMAL) at the KU Leuven University Hospitals in Belgium supplies the required high-tech infrastructure for three dimensional motion analysis and for instrumented assessment of muscle impairment and muscle morphology. The clear link to the clinical field is a unique aspect of the involved team and creates a strong translational power. The research management at CMAL, with a strong focus on key areas and an exponential growth of publications since 2010, is built on a solid commitment for knowledge and expertise exchange between the Department of Rehabilitation Sciences, and the Department of Physical Medicine and Rehabilitation of the University Hospitals of Leuven. CMAL also closely collaborates with the multidisciplinary Orthopedic Research Laboratory of the University Hospitals for orthopaedic studies in knee, hip and ankle pathology and with the Department of Mechanical Engineering, and the Laboratory of Cardiovascular Imaging and Dynamics for sensor fusing, advanced data analysis, modelling and muscle imaging. Two conventional clinical motion labs and one treadmill lab are equipped with of two to four forceplates, a 10 to 15 camera three dimensional motion capture system and a 16 channel surface EMG system, as well as instrumentation to assess metabolic energy consumption. The main research line at the CMAL focuses on the relationships between muscle impairments (spasticity and weakness) and function (gait and upper limb function), in particular in children with cerebral palsy. As such, besides the motion labs, CMAL is also equipped with specialized high-tech instrumentation that integrates biomechanical and electrophysiological signals to quantitatively assess spasticity and weakness as well as static and dynamic musculoskeletal ultrasound imaging. Such objective measurements allow links to be made between pathophysiology, the development of impairments, and their effects on upper and lower limb function, for a variety of neurological and musculoskeletal disabilities in children and adults.

OP267
EUROMOV FROM SENSORIMOTOR SIGNATURES OF HEALTH TO REHABILITATION

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Purpose: Euromov focuses on identifying sensorimotor signature of health through numerous technological approaches, including movement analysis (kinematics, electromyography…), posturology, brain signal analysis, and muscular function analysis. Biological signal processing aims to understand movement complexity, to assess efficiency and deficiency, to develop multidimensional analysis and to build new rehabilitation tools/paradigms based on multimodal technologies. Euromov currently involves 70 researchers, one third of them being clinicians. The laboratory is divided into three teams and relies on a transversal methodological axis focusing on biological signal processing. Translational research concerns Stroke, Low Back Pain, Parkinson, Schizophrenia….
Methods: The team "Neuroplasticity and Rehabilitation" develops original methods to record movement kinematics (diverse motion capture) and brain signal (NIRS, EEG, fMRI). Recorded signals help to better understanding of the dynamics of the brain and behavior functioning, and to promote functional and brain plasticity after stroke or other neurological/locomotor diseases.
Results: Movement analysis led to define pertinent kinematics markers usable to monitor rehabilitative video games, or to quantify the "functional reserve" concerning upper arm motility after stroke. Brain signal recording led to demonstrate the feasibility of brain recording in ecological condition (NIRS) in order to monitor attention, but also brain plasticity through inter-hemispheric balance.
Discussion: Based on these previous results, we plan to build a closed-loop rehabilitation program of upper arm disability after stroke involving

- Adaptive and auto-adaptive video games
- Multimodal interaction devices, including robotics
- Online monitoring of movement structure (kinematics) and brain signal (NIRS and EEG)
- Coupled with direct brain stimulation
- Under the control of a therapist

OP268
A PLATFORM DEDICATED TO THE ASSESSMENT OF PHYSICAL AND COGNITIVE FUNCTIONAL CAPACITIES

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The Technological Investigation Platform is a department of the clinical investigation center INSERM 1432. This structure covers 300m2, located in the rehabilitation Dept of the Universitary Hospital of Dijon. It is equipped with the latest innovative noninvasive tools for the assessment of human motricity (Vicon equipment, AMTI Platforms + stairs, wireless EMG ; VO2 measurement cell ; Biodex, NIRS and $TcPO_2$). It allows connexion between fundamental researches of the INSERM 1093 lab "cognition, action and sensorimotor plasticity" and their clinical applications or industrial developments. It focuses on the development/evaluation of innovative methods and devices in the field of motor disabilities, and the relationship between physical and cognitive abilities. The staff consists of three physicians, one project manager, two research engineer and a research technician. The research relies on four main scientific and clinical axes: 1/ Enhancement of technological procedures for non-invasive analysis, enabling routine applications, based on new electromyographic analysis algorithms (Nair 2010), on corrections procedures of kinematics (Baudet 2014 - Ornetti 2015), metrological validation of 3D analysis (Laroche 2011-15), standardized walking tests (Gremeaux 2011), NIRS Signals (Lacroix 2012). 2/ Increased knowledge on motor strategies reorganization in osteoarthritis or ageing people (Ornetti 2010 - Personnier 2010 - Ornetti 2011 – Laroche 2014 – Cattagni 2014). 3/ Validation of walking tests to assess the evolution of motor disabilities after a rehabilitation program in lower-limb amputees (Gremeaux 2012), and coronary artery disease patients (Gremeaux 2012 – Casillas 2013 -. Morard 2015. - Casillas 2014). 4/ Development of innovative reconditioning devices like eccentric ergometer (Laroche 2013) to improve the functional status of patients with severe chronic disabilities: coronary patients (Gremeaux 2010), Chronic heart failure (Besson 2013 - Casillas 2015). Participation in the clinical and biomechanical assessment of innovative orthosis in knee osteoarthritis (Laroche 2014 - Ornetti 2015)

OP269
CLINICAL RESEARCH UNIT IN REHABILITATION

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Our faculty hospital and medical school are based on the same university campus in Brussels, allowing close and fruitful collaborations between clinicians and researchers.
From such collaborative approach, several researches are conducted on three complementary domains. The first domain of interest is the functional assessment of disabled patients. We developed ICF based Rasch validated questionnaires. For instance, the ABILOCO questionnaire is calibrated and used to assess the locomotion abilities of brain injured adult and paediatric patients. Our second domain of interest is the upper and lower limbs movement analysis among healthy subjects and patients. We have shown how stroke disturb the upper limb kinematics and why stroke patients expend so much energy to walk slowly, using quantified motion analysis (including the simultaneous assessment of kinematics, kinetics, oxygen consumption and electromyography). Finally, the clinical research in neurorehabilitation constitutes our third domain of interest. For instance, we performed randomized controlled trials showing the efficacy of robotic assisted upper limb rehabilitation among cerebral palsy children, and the efficacy of selective tibial neurotomy for treating spastic equinovarus foot after stroke. Additionally, we regularly participate to international clinical trials leaded by drug companies.
They are currently five PhD projects leaded by Physical Medicine and Rehabilitation fellows and by physical therapists. Their topics are: self rehabilitation after stroke in Benin; upper limb robotic and serious game assisted rehabilitation after brain injury; effect of a therapeutic exercises programme on gait variability among parkinsonian patients; relationship between physical deconditioning and fatigue among multiple sclerosis patients.

OP270
EA4136 HACS HANDICAP ACTIVITY AND COGNITION FOR HEALTH. UNIVERSITY OF BORDEAUX FRANCE

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Born in 2007, our research team "Handicap Activity and Cognition for Health" is a melting pot joining academic specialists in Physical Medicine and Rehabilitation (PRM) and rehab professionnals moving to applied research in handicapped patients suffering from various acquired or constitutional neurological diseases. Since 2011 we gained interdisciplinary with entry of new team members issued from social sciences and sport sciences. These strengths were involved in successful Bordeaux University Cognitive Science Master and Doctoral Programme. Our research engage as various pathologies as autism, cerebra-vascular diseases, infectious, inflammatory or genetic disorders, traumatic brain injury , degenerative diseases of the central nervous system or aging process. Rehabilitation science is an interdisciplinary field that focuses on human function and disability; our field of research covers biomedical and technological aspects as social functioning and developing, improving and restoring the highest possible level of independence. Disablement is now understood as an identifiable variation of human functioning. The term 'participation' is used to identify the nature and extent of a person's involvement in basic areas of human life. Our group study non pharmacological or technological innovative approaches from acute care to home to allow optimal participation of individuals suffering from neurological diseases. Comprehensive assessment and therapies address motor or postural, cognitive and communication, autonomic system impairments. Interactive and virtual reality sytems are used in assessment and rehabilitation perspective. We use mostly cooperative or mutualised platforms or low-cost and mini-invasive devices. More recently we gave interest in integrative approach in real life home conditions which allow more efficient and individual sized answers.

OP271
RESEARCH ACTIVITY AT THE NEUROREHABILITATION CLINIC OF ANCONA, ITALY

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The Neurorehabilitation Clinic is an inpatient rehabilitation facility, located in a University hospital. Main clinical activities:

1. intensive rehabilitation of stroke patients within a comprehensive stroke unit;.
2. regional reference centre for spasticity management; both botulinum toxin injections and intrathecal baclofen pump implantation are available treatment.
3. regional reference centre for patients with neuromuscular disorders (namely muscular dystrophy and amyotrophic lateral sclerosis), who are taken in charge at the very moment of diagnosis and offered counselling and training to the use of aids for mobility and non -invasive ventilation.
4. Rehabilitation of patients with Parkinson's disease is delivered through the application of cueing strategies, dance and singing therapy, as well as through innovative technologies, like not invasive cortical stimulation, virtual reality and action observation.
5. Rehabilitation of patients undergone reconstructive surgery after severe traumatic hand injuries or amputations is carried out by an experienced team.
6. Rehabilitation of women in the acute and subacute phase after mastectomy is also an excellence activity.

Current research projects:

1. The efficacy of tDCS at treating freezing of gait in Parkinson's disease
2. The effectiveness of not invasive cortical stimulation, combined with a task-oriented training, to enhance motor recovery after stroke:
3. Comparative efficacy of different task-oriented approaches to improve gait and balance in advanced Parkinson's disease.
    1. Predicting Freezing of Gait in Parkinson Disease with a smartphone: the usefulness of not-intrusive architectures at detecting and relieving gait troubles.
4. Low cost RGB-D vision based system for on-line performance evaluation of motor disabilities rehabilitation at home
5. Computerized 3D posture analysis of trunk abnormalities (Pisa Syndrome) in subjects with Parkinson's Disease: monitoring the effects of pharmacological and rehabilitation approaches
6. The efficacy of an action observation based rehabilitation protocol at improving deftness and gait in Parkinson's disease.

OP272
THE TECHNOLOGICAL INVESTIGATION PLATEFORM CIC INSERM 1432, CHU DIJON, FRANCE

Gremeaux Vincent[1], Laroche Davy[2], Morisset Claire[2], Besson Delphine[2], Ornetti Paul[2], Casillas Jean-Marie[2]

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The Technological Investigation Plateform is a department of the clinical investigation center INSERM 1432. This structure covers 300m2, located in the rehabilitation Dept of the Universitary Hospital of Dijon. It is equipped with the latest innovative noninvasive tools for the assessment of human motricity (Vicon equipment, AMTI Platforms + stairs, wireless EMG ; VO2 measurement cell ; Biodex and NIRS). It allows connexion between fundamental researches of the U1093 lab "cognition, action and sensorimotor plasticity" and their clinical applications or industrial development. It focuses on the development/evaluation of innovative methods and devices in the field of motor disabilities, and the relationship between physical and cognitive abilities. The staff consists of three physicians, one project manager, two research engineer and a research technician. The research relies on four main scientific and clinical axes:
1/ Enhancement of technological procedures for non-invasive analysis, enabling routine applications, based on new electromyographic analysis algorithms (Nair 2010), on corrections procedures of kinematics (Baudet 2014 - Ornetti 2015), metrological validation of 3D analysis (Laroche 2011-15), standardized walking test (Gremeaux 2011), NIRS Signals (Lacroix 2012).
2/ Increased knowledge on motor strategies reorganization in osteoarthritis or aging people (Ornetti 2010 - Personnier 2010 - Ornetti 2011 – Laroche 2014 – Cattagni 2014).
3/ Validation of walking tests to assess the evolution of motor disabilities after a rehabilitation in lower-limb amputees (Gremeaux 2012), and coronary artery disease patients (Gremeaux 2012 – Casillas 2013 -. Morard 2015. - Casillas 2014).
4/ Development of innovative reconditioning devices like eccentric ergometer (Laroche 2013) to improve the functional status of patients with severe chronic disabilities: coronary patients (Gremeaux 2010), Chronic heart failure (Besson 2013 - Casillas 2015). Participation in the clinical and biomechanical assessment of innovative orthosis in knee osteoarthritis (Laroche 2014 - Ornetti 2015).

OP273
PRECLINICAL EVALUATION OF NEW THERAPEUTIC STRATEGIES TO REDUCE SPASTICITY

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The multidisciplinary "Institut de Neurosciences de la Timone" in Marseille integrates researchers from a variety of scientific and medical backgrounds with the objective to study the mechanisms underlying the central nervous system function and dysfunction. The team P3M "Plasticity and PhysioPathology of rythmics Motor networks", embedded within the institute, aims to investigate the pathophysiological mechanisms involved in spasticity. More than 12 million people worldwide are affected with spasticity, one of the most disabling motor deficit. Spasticity is commonly caused by several pathologies such as spinal cord injury (SCI), stroke, multiple sclerosis, cerebral palsy… Spasticity was defined by Lance (1980) as a velocity-dependent increase in muscle resistance to passive stretch. Spasticity is usually associated with hypertonia, clonus, muscle spasm and pain. The therapies of spasticity face a variety of limitations. Treatments are ineffective without serious side effects and furthermore tolerance develops. Thus, spasticity imposes significant burdens on health services and society. A more effective approach to reduce spasticity may be achieved by treatments that act simultaneously on several mechanisms involved in spasticity. Among these mechanisms, we can mention an excitatory/inhibitory imbalance of motoneurons leading to hypertonia. The P3M team aims to identify the upstream mechanism in the pathophysiology of spasticity to develop an original, effective, tolerable and minimally invasive treatment.To tackle these issues, a multidisciplinary approach is used in animal models including genetic tools,behavioral tests, electrophysiology, biochemistry and immunohistochemistry. The talk will illustrate the combined efforts between neuroscientists and clinicians to provide a significant breakthrough in the etiology of spasticity, to evaluate preclinical investigations in reducing spasticity and to improve the care and quality of life of spastic patients

OP274
THE CLINICAL MOVEMENT LABORATORY OF ERASMUS UNIVERSITY MEDICAL CENTRE

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The clinical movement laboratory (CML) of Erasmus University Medical Centre in Rotterdam is a facility that provides services for both clinical as well as research departments. Measurements are performed mostly for rehabilitation patients, but also for patients referred by orthopaedic surgeons, paediatricians, neurologists, etc. The CML has the capacity to do maximum oxygen uptake tests including ECG, isometric and isokinetic muscle strength testing and instrumented gait analysis including EMG, ground forces etc. A CML is a facility that supports clinical decision making and therefore is an important part of modern clinical and research departments in PRM. Some of the logistic, financial and administrative challenges of our CML will be discussed.

OP275
RESEARCH ON VERTICALITY PERCEPTION AT THE LPNC

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The Laboratory of Psychology and NeuroCognition (LPNC, dir Pr Monica Baciu) is a Joint Research Unit affiliated to the CNRS and to two universities, Grenoble-Alpes and Savoie MontBlanc. LPNC has links with the research structures such as Grenoble University Hospital and Grenoble Institute of Neuroscience. LPNC research activity is focused on the study of human cognition in the areas of perception, action, space, memory and language.
Our PMR department has close links with the LPNC, mainly through the team Perception and Sensory-Motricity (Dir Carole Peyrin). Our research primary deals with the sense of upright, ie the unified sense of one's body orientation against gravity and verticality representation on Earth. We are interested both in basic and clinical research. Our basic research aims to better understand the neural bases and the functioning of internal model of verticality, in particular in terms of hemisphere lateralization, together with the relationship between perception and action with respect to gravity. Our clinical research aims to implement and validate assessment tools dedicated to the sense of upright in a clinical context, and propose and test novel rehabilitation technics and programs for people who show postural disorders due to a bias in their representation of the vertical, especially in Neurorehabilitation. More details on these researches may be found in Pérennou et al Brain 2008 and NCCN 2014; Barra et al Stroke 2008, Neurology 2009, Brain 2010, Neuropsychologia 2012, as well as Piscicelli et al Stroke 2015, BMC Neurology 2015, and NNR 2016.

OP276
ESTIMATION OF NEUROMUSCULAR PERFORMANCE

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Previous projects were devoted to study of muscle function at ageing as collaboration between different Europe countries (”Understanding and combating age-related muscle weakness- MYOAGE ”, EU FP7 project); elaboration of new device for muscle tone measurement („Development and introduction of novel technology to be embedded in Myoton Lite allowing for objectified muscle assessment – MYOLITE ”, EU EUREKA Eurostars programme); pre- and postoperative rehabilitation and biomechanical aspects in osteoarthritis patients, neuromuscular fatigue related to age and recreational physical activity; motor function and bone mineral density in children with cerebral palsy (Ministry of Education of Estonia and Grants of Estonian Science Foundation) and evaluation of posture and movement in children with cerebral palsy” (Ministry of Foreign Affairs of Italy, co-operation project between Italy and Estonia).
Evidence-based study supported by appropriate technologies in kinesiology, gait and motion analysis (motion analysis system ELITE, BTS, Italy) with walkway and embedded two force plates (Kistler Instrumente AG, Switzerland); postural stability measurement by above mentioned force plates and software (Sway, BTS, Italy); for muscle function esimation - different isometric strength measurement devices, electromyography (EMG) by 16 channel telemetric EMG system ME6000 (Mega Electronics Ldt., Finland) and electromyostimulation by electrical stimulator DS7A (Digitimer Ldt, United Kingdom) and software WSportLab (UraniaCom, Estonia); muscle tone measurement (myotonometry) by device Myoton (University of Tartu, Estonia); foot pressure distribution by Digitalised Biometry System (DIASU, Italy); hand and eye coordination test measurement devices.
Result of our study are presented in PhD and Master Thesis of students (total number is over 100) and in published articles of leading journals in Kinesiology, Orthopaedics, Sports Medicine and Rehabilitation (more than 60 in per-reviewed journals and more than 70 in other scientific journals or proceedings).

OP277
MICROGRAVITY APPLIED TO THE PHYSIOTHERAPY TECHNIQUES

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Introduction Therapeutic exercise in microgravity environment (TEMigE) is a Reeducational technique that takes advantage of the physical properties of water in order to gain favorable conditions and facilitations to the global movement of the body and its parts.
Purpose Evaluate the effectiveness of microgravity applied to physiotherapy techniques in various pathological conditions.
Methods We have conducted the following studies during the PRM Doctoral Studies in TVU (Advanced Sciences and Technologies in Rehabilitation Medicine and Sports PhD): 1 case report and 3 quasi-experimental design.
Results From the results obtained in the case report, the re-education in microgravity environment is able to improve the painful symptoms, mood and quality of life in a patient suffering from Fibromyalgia (FMD). In a quasi-experimental design in patients with chronic low back pain, TEMigE is a good tool for the reduction of pain and joint limitation to ameliorate disability on professional and daily activities.In the other two quasi-experimental designs, data collection from stabilometric platform and rating scales on balance, coordination, autonomy, spasticity, fatigue and quality of life, support the thesis that TEMigE is an effective treatment of patients with Multiple Sclerosis.
Discussion and Conclusions In light of the findings and despite the methodological limitations of our studies, we can say that TEMigE could be a valuable procedure among the reeducational programs, given the positive influence on balance, coordination, proprioception, muscular strengthening and psychological factor of patients studied.

OP278
MECHANICAL VIBRATION: A PHYSIOTHERAPY TECHNIQUE IN PHYSICAL AND REHABILITATION MEDICINE

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Introduction The mechanical vibration (MV) represents a main topic in Physical and Rehabilitation Medicine (PRM). MVs are mechanical waves induced directly or indirectly, at low and medium frequencies, producing physiological effects in the human body.
Purpose To evaluate the effectiveness of MV in different PRM areas.
Methods Three studies have been performed: 3 case reports (CR), 2 randomized clinical trials (RCT) and 1 quasi-experimental design.
Results In the first two CRs, the effectiveness of MV in osteoporosis (increase of 15.41% in BMD) and non-union fractures has been evaluated. In the third CR, clinically significant reduction of flexor hypertonia in hemiplegic patients was observed, with increased range of motion of the elbow (T_0=84,9° – T_1=164°) and spasticity reduction (Modified Ashworth Scale from 4 to 2). In the RCT the MV effectiveness in improving the activity of the pelvic floor muscles has been demonstrated. After Whole-Body-Vibration (WBV) treatment, the median values of both phasic pubo-coccygeus (PC) test (T_0=3.0 – T_1=4.5) and tonic PC test (T_0=2.00 – T_1=3.00) showed an improvement. In the quasi-experimental design, in subjects with multiple sclerosis the MV has been effective in reducing lower limb hypertonia and fatigue, and improving quality of life, showing statistically significant differences ($p<0.05$) between the pre- and post-treatment assessment.
Discussion and Conclusion According to the above results (despite of their methodological limitations), an improvement in different outcome measures has been reported. Thus, MV application in Orthopedic, Neurological, and Uroginecological disabilities seems to provide benefits for patient conditions.

OP279
MULTIVARIATE STATISTICAL PROCESS CONTROL FOR MIXED-TYPE DATA AND ITS USE IN HEALTHCARE

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Introduction: Multivariate statistical process control (MVSPC) based on mixed-type data (MTD) is a very recent and little known field. We review the possibilities for MVSPC with MTD (some numeric and some categorical variables, which is common in healthcare) and identify four main approaches: nonparametric approach, machine-learning approach, dimensionality reduction yielding numeric dimensions from which control charts can be constructed, and measuring distances between MTD-points (from which control charts can also be constructed).
Purpose: To examine different approaches for MVSCP for MTD, perform realistic simulations to evaluate sensitivity and type 1 error, and apply the studied methods on a real case study.
Method: We conducted pilot simulations of applying the distances-between-MTD-points approach to healthcare quality monitoring with 6 options (Euclidian distance local/global, Hotelling's T^2 bootstrap-based/formula-based, Gower distance local/global). We will do the same for other approaches and try to assess their applicability and effectiveness in clinical setting with a sample of patients after lower limb amputation who had been rehabilitated and fitted with prosthesis. Out-of-control patients before discharge are those who return after discharge because of problems with the prosthesis.
Results: Global Euclidian distance approach may be the most sensitive but its type 1 error rate is slightly too high. Local Gower distance approach improves as number of categorical variable increases and excels with non-normally distributed numeric variables.
Discussion: Local Gower distance approach seems to be the most appropriate for MTD. We will try other suggested approaches, construct ROC (receiver operating characteristic)-type curves, study average run length, consider updating the phase-1-sample and perform a clinical case study.
Conclusions: If it turns out that one of the approaches can be applied to the selected group of patients, it would be an important contribution to quality improvement in healthcare.

OP280
OUTCOME MEASURES IN OCCUPATIONAL THERAPY AND REHABILITATION

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Introduction: Despite the availability of several Patient-Reported Outcome Measures (PROMs) for Patient's Satisfaction with Orthotics (PswO), the majority are developed in English language. To our knowledge, no Arabic versions assessing PSwO is currently available. Thus, there is a need to produce validated versions of the best existing PROMs adapted to the Arabic culture, and utilizing Rasch analysis (RA), as a recommended method to rigorously assess its psychometric properties.
Purpose: To translate into Arabic, culturally adapt and analyze -using RA approach- the Quebec User Evaluation of Satisfaction with assistive Technology (QUEST 2.0) and The Client Satisfaction with Device (CSD) module of the Orthotics and Prosthetics Users' Survey. Additionally, identifying psychometrically valid questionnaires for assessing PSwO.
Methods: A cross-sectional study on 100 individuals from two hospitals in Riyadh, Saudi Arabia. Inclusion criteria: current use of orthosis and age above 18 years. Presence of cognitive deficit and Non-Arabic speakers were excluded. RA used to analyze: functioning of rating scale categories; construct validity; reliability; dimensionality of the scale and local independency of items.
Results: RA scale diagnostics showed that the rating scales complies with the preset criteria for category functioning. A-QUEST 2.0 and CSD-Ar demonstrated a good to acceptable construct validity respectively, however CSD-Ar showed low reliability. Item difficulty for both questionnaires was well targeted to the patient's ability. Furthermore, four questionnaires only were identified (two generic orthotic use and two for application with orthopedic shoes) prove to be potentially suitable after filtering for solid metric characteristics.
Disscusion and conclusions: This thesis extends validity evidence of CSD and QUEST 2.0 for assessing PswO in Arabic language and culture. Futhermore, it allows to suggest further refinement to optimize the measurement performance of the tools. Overall, the thesis provided basis for future research to address the gaps, specifically in Arabic-speaking countries. It aslo attests the need for more studies investigating the psychometric properties of existing PSwO.

OP281
MUSCULOSKELETAL ULTRASOUND, DIAGNOSTIC AND THERAPEUTIC VALUE IN REHABILITATION MEDICINE

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Introduction Musculoskeletal Ultrasound (MSUS) underwent considerable development in recent years;adapting this technology in physical and rehabilitation medicine (PRM) constitute major challenges.
Purpose The aim of the thesis was to evaluate the role of MSUS in PRM from different perspectives, with additional consideration to physiatrists' awareness and education.
Methods 6 studies have been conducted;diagnostic value was examined through literature search on rotator cuff tear (RCT) and patellar sub-luxation.US-guided intra-articular injections in knee and hip osteoarthritis were examined through quasi-randomized cross-over study and prospective observational study respectively. Utility in plantar fasciitis regarding assessment of treatment was tested through prospective observational study and case report. Survey evaluated the awareness of physicians and educational article, were also included in this thesis.
Results Diagnostic US/Reviews; US accuracy was comparable to that of MRI in full-thickness RCT with conflicting results in partial tear,about patellar subluxation,one eligible ultrasonographic study showed that measuring the cartilaginous sulcus angle on femur can distinct between patients and controls. US guided injections; Quasi-randomized cross over study was difficult to conclude that US guidance on knee injections was superior to blind technique. Prospective observational study suggest safety and long-term effectiveness of single US guided injection of Hylastan SGL-80 in patients with moderate primary hip osteoarthritis. Assessing treatment; in prospective observational study and case report, US utility in objective assessment of therapeutic response in plantar fasciitis was observed. Awareness/Education; A 15-question survey before/after a 2½-day MSUS course revealed that PRM physicians are becoming aware of MSUS value in clinical practice. An educational article reviewed history, principles and applications, adding instructions for beginners.
Discussion and conclusions MSUS in PRM is not only efficient in diagnoses and therapeutic guidance but also in evaluating response to treatment, still for high level of competence investment in training is required.

OP282
STRIDE DURATION VARIABILITY AS A BIOMARKER OF FALL RISK AND THERAPEUTIC EFFICACY OF REHABILITATIVE APPROACHES IN PATIENTS SUFFERING FROM PARKINSON'S DISEASE

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In addition to reduced gait speed, shorter stride length, stooped posture and reduced arm swing, typical gait disorders in Parkinson's disease (PD) are characterized by postural and gait instability, which can lead to an increased fall risk.[1] A higher fall risk has typically been associated with a lack of adaptive gait control in the presence of sensorimotor variability or external disturbances.[2] Thus, detection of specific markers of gait instability appears critical for preventing falls and their consequences.
While falls generally occur during locomotion, gait variables from standard three-dimensional quantified walking analyses do not constitute adequate predictors of falls.[3] However, temporal organization of stride duration variability has recently been mentioned as a good candidate from which to derive markers of gait instability as it is tightly linked to rhythm control, which is particularly impaired in PD.[4] Indeed, stride duration fluctuates in a structured, complex manner over the long term, displaying the presence of long-range autocorrelations (LRA) that can span hundreds of consecutive strides.[5,6] LRA result from the memory of the preceding values in the series, highlighting the existence of a complex temporal structure in human locomotion[5-10].
Interestingly, recent studies claimed that the temporal organization of variability (i.e., LRA) would represent the signature of adaptive abilities of healthy systems and their breakdown an index of pathological condition.[11,12] By extension, the degradation of LRA with pathology was associated to dynamic instability in locomotion.[12] However, no studies have included the analysis of LRA in the functional assessment of PD.
Considering gait instability and temporal gait disorders in PD, we hypothesised that stride duration variability would be less structured in PD, could be correlated with their functional assessment and could be improved by specific rehabilitative approaches. Therefore, our PhD project will investigate the analysis of the LRA as a clinical tool for assessing the risk of falling and secondarily for evaluating the therapeutic efficacy of the medication and/or practice of exercise in a population of patients suffering from Parkinson's disease.

OP283
FALL'S EPIDEMIOLOGY ON A PORTUGUESE ADULT POPULATION

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Introduction: Falls and consequent injuries represent a major public health problem as it occurs in 25-30% of people over 65 each year, increases in hospitalized patients and 30-60% of them experienced recurrent falls, with increasing of dependence, immobilization and depression resulting in restriction of their daily activities. Falls culminate in a negative economic impact with significant high costs for the family, community and society partly due to the huge healthcare costs and long-stay hospitalization.
Purpose: Analysis of inpatient's characteristics and epidemiology whose falls led to hospitalization in a General Hospital.
Material and Methods: Observational study, using admission and discharge data of the patients admitted in Orthopaedic Department (OD) in the time period between January 1st and March 31st 2014.
Results: A total of 387 patients were analyzed in OD, 232 women and 155 men with a mean age of 63.0 (±19.9) years and a mean of 1.75 secondary diagnoses. Mean time hospitalization of 8.9 days, ranging of 1-76 days. 174 of 387 (45,0%) patients were admitted in OD after a fall. For these group, the mean age was 72.0 (±18.0) years and a mean of 1.95 of secondary diagnosis. Hospitalization mean time was 11.9 days. About 55.7% had an hip fracture and 34.5% experienced recurrent falls. At admission, 92.5% came from home, 80.0% returned home. First-year mortality of 9.1%.
Discussion and conclusions: Based on the knowledge that our population is getting older and the number of falls increase in magnitude as it occurs, worldwide, it is of major relevance the implementation of preventive measures in immediate future. We consider fundamental an adequate approach in relation to the risk factors, history of previous falls both in in/outpatients group in order to promote security.

OP284
POST-DISCHARGE SURVEILLANCE: RISK FACTORS FOR FALLS FOLLOWING HOSPITAL DISCHARGE IN THE ELDERLY POPULATION

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Introduction: The incidence of falls after hospital discharge was reported to be higher than in routine life, especially in elderly people. Falls are a major cause of disability, with potentially life-threatening complications. The identification of risk factors associated with falls is required to plan preventive actions.
Purpose: To determine the incidence of falls in the 3 months following hospital discharge and related risk factors in elderly patients.
Methods: A hundred patients over 65 years, admitted to an Internal Medicine Ward, took part on this prospective study. A questionnaire was performed during the hospitalization period, and a phone call three months after discharge. Follow-up information was not obtained for 31 patients (25 deceased, 6 unreachable). An analysis was performed to determine risk factors for past and post-discharge falls.
Results: Included 100 patients, 52% male, aged 80±8.1 years (mean±SD). For 69 patients follow-up information was obtained, 18 reported falling during the 3-months period. Higher risk of falls was associated with history of falls in the previous 6 months ($p<0.05$ RR=2.76) and shorter hospital stays (≤7 days) ($p<0.05$ RR=2.78). Polymedication ($p=0.002$), use of psychoactive drugs ($p=0.019$) and analgesics ($p=0.026$) were associated with a higher incidence of falling. Age, sex, polymedication, treatment with psychoactive drugs and short hospital stay were identified as potential risk factors on individual analysis. However, on a multiple logistic regression analysis with these factors, only short hospital stay reached statistical significance.
Discussion and conclusions: Further studies are needed to validate the risk factors identified following hospital discharge and to evaluate the efficacy of preventive measures. Elderly patients discharged from an Internal Medicine Ward, mainly those admitted for a short length of stay (≤7 days), should be screened for previous history of falls and medication and ideally integrate a comprehensive program of falls prevention.

OP285
FUNCTIONAL DECLINE IN HOSPITALIZED ELDERLY PATIENTS: A PROSPECTIVE STUDY

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Introduction: Elderly patients are at risk of functional decline after acute care hospitalization. Previous studies demonstrate that 30 to 60% of the elderly develop new limitations performing activities of daily living (ADLs) after hospitalization.
Objectives: To evaluate variability and associated factors of functional decline after acute care hospitalization (ACH) and to evaluate referral to in-hospital rehabilitation programs.
Methods: We performed an observational, prospective study, of a sequent sample with patients >65 years with a Katz index (KI) >0 admitted to a hospital ward of Internal Medicine. Evaluation of functional capacity (FC) was performed using modified KI and Barthel Scale (BS) in 2 moments. The first evaluation of FC was carried out up to 24 hours after admission and the second at time of discharge. Sociodemographics and clinical data were collected.
Results: During the study period (90 days), 55 patients satisfied the established criteria, with a median age of 81years. Previous to admission at the hospital ward, 65% according to KI and 84% according to BS presented some degree of limitation performing ADLs. The median time of hospitalization was 9 days. During hospitalization, 16% of the patients were referred to evaluation by Physical and Rehabilitation Medicine, a median of 3 days prior to discharge. At discharge, 44% according to KI and 62% according to BS of the patients presented functional decline in at least one ADLs relatively to admission ($p<0,001$). Transfers, gait and climbing stairs were the ADLs with greater functional decline. The age of patients and residence in health care institutions were associated with functional decline after hospitalization ($p<0,05$).
Discussion and conclusions: ACH represents an important risk factor for elderly to develop new functional limitations. The activities related to mobility are most affected. Despite the existence of hospital rehabilitation programs, these are not well articulated as referral to these programs is scarce and occurs belatedly.

OP286
FALL PREDICTORS IN ELDERLY – PRELIMINARY STUDY

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Introduction: Fall-related injury in elderly is a considerable public health problem. Many conditions contribute to falling and some of them can be changed or modified like difficulties of walking and balance, nutritional status and physical inactivity. The ability to identify risk factors for falls might point out which patients are at higher risk.
Purpose: This study aims to identify predictive factors of falls in elderly patients, in order to establish preventive and therapeutic strategies.
Method: A sample of 52 adults, aged 65 to 80 years, with Functional Independence Measure (FIM) greater than 120 and Timed Up & Go Test (TUG) less than 12 seconds, was recruited from an outpatient physical and rehabilitation medicine department. Trained interviewers administered a standardized questionnaire which included (1) socio-demographic, anthropometric, exercise, health and falls parameters, (2) a functional evaluation based on Activities-specific Balance Confidence (ABC) and (3) nutritional status assessment using the Mini Nutritional Assessment Short Form (MNA-SF).
Results: Participants were mostly women (76.9%) aged 71.6±4.7 years old, with FIM 123.0±8.7 and TUG 9.5±3.1 seconds. 63.5% were overweight or obese and, according to the MNA-SF, 26.9% were at risk of malnutrition. BMI showed a non significant correlation with the number of falls ($p=0.06$). 76.9% were physically active but only 25.0% did regular exercise 4 or more times a week. In the previous year, 57.7% of the total fell at least once (mean number of falls 2.7±2.2). In the physical inactive group 83.3% fell. Regular physical activity correlates with falls ($p<0.05$). 55.8% took more than 4 drugs dairy. ABC score was 65.4±19.4 and correlates with the number of falls ($p<0.05$).
Discussion and conclusions: In this stage of the study, ABC score and regular physical activity present an association with falls ($p<0.05$) and can be used as potential fall predictors.

OP287
PHYSIATRIC APPROACH TO NEUROMUSCULAR GENETIC DISEASES: THE CASE STUDY OF A FAMILY AFFECTED BY POMPE DISEASE

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Introduction: Pompe disease or glycogenosis type Ii is an autosomal recessive storage disorder due to mutations of the acid a-glucosidase gene on the chromosome 17q21-23 which causes absent or deficient activity of the lysosomal enzyme acide a-glucosidase. The late onset phenotype leads to limb-girdle weakness and respiratory problems. The introduction of enzyme replacement therapy has significantly improved the treatment of patients with Pompe disease changing their life perspective. Therefore more attention should be paid to the rehabilitative aspects.
Purpose: The aim of our paper is to assess functioning and musculo-skeletal involvement in a group of patients presenting late-onset Pompe disease.
Method: In a family of 13 siblings of which 10 affected by late-onset Pompe disease, we studied 7 siblings that presented the same genotype (p.R40X/p.N882fs). All patients underwent the following assessment: Range of Motion, muscle function, bone mineral status, pain, fatigue, balance, gait, abilities in ADLs and health related quality of life.
Results: The seven siblings (4 females and 3 males) analyzed in the present study had a mean (SD) age of 52 (6.2) years. They received diagnosis of Pompe disease and started ERT on 2011. Four siblings were osteopenic, 1 of them, a female, was osteoporotic and had 2 vertebral fragility fractures. They all had proximal muscle weakness of lower limbs resulting in a waddling gait, one of them needed physical assistance for walking.
Discussion and conclusions: Our 7 patients were siblings characterized by a moderate proximal weakness, a waddling gait, an exercise intolerance and an easy fatigability, one of them also had respiratory insufficiency.

OP288
MOTOR CONTROL STRATEGIES FOR UPPER LIMB MOVEMENTS AFTER TETRAPLEGIA. A KINEMATIC REVIEW

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Introduction: The aim of this literature review is to provide a clear understanding of motor control and kinematic changes during open-chain upper limb (UL) movements after tetraplegia and state the implication for rehabilitation.
Method: Using data from MEDLINE between 1966 and August 2014, we investigated kinematic UL studies after tetraplegia.
Results: We included fourteen control-case and three series-case studies with a total of 161 spinal cord injury (SCI) and 126 healthy control participants. SCI individuals planned UL movements according to two kinematic invariants that are endpoint accuracy and economy. Furthermore, motor slowing is a clear kinematic characteristic, caused by (i) decreased strength, (ii) accuracy requirements at movement endpoint, (iii) triceps brachii paralysis disrupting normal agonist-antagonist co-contractions (above C7 SCI), and (iv) grasping (C6-C7 SCI). Below C5 SCI, these individuals can still achieve a broad range of tasks reflecting effective scapulothoracic and glenohumeral compensations that provide a dynamic mechanical coupling between the shoulder and elbow joints thus palliating elbow extension despite triceps brachii paralysis. However this mechanism is incomplete since C5-C6 SCI individuals reduce overhead workspace to keep the elbow extended and to maintain the mechanical dynamic interaction between the shoulder and elbow. Surgical restoration of active elbow extension causes increased elbow stiffness resulting in increased movement velocity, reduced glenohumeral compensation, and overall improved motor control. After C6-C7 SCI, grasping requires prolonged deceleration phase during transport to ensure hand placement with respect to the to-be-grasped object then wrist extension during grasping to elicit either whole hand or lateral grip. Contrary to the normal pattern, where grasping is prepared during the transport phase, C6-C7 SCI individuals perform reaching and grasping consecutively indicating that reaching is independent from grasping.
Conclusions: Rehabilitation and surgical restoration of UL should take these kinematic findings into account to favor greater autonomy of individuals after SCI.

OP289
USE OF ASSISTIVE DEVICES FOR WALKING IN LONG-TERM FOLLOW-UP OF SPINAL CORD INJURY PATIENTS

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Introduction: Prescription of orthoses that facilitate physical functioning is a major component of the rehabilitation process in spinal cord injury. However, it is a common experience that patients stop using assistive devices once they are discharged from the hospital.
Purpose: To evaluate the long term use of orthoses in spinal cord patients and investigate the factors related to patients' discarding the device.
Methods: Medical records of 163 spinal cord injury patients included in an inpatient rehabilitation were reviewed. Functional state of patients and use of assistive devices for ambulation (knee-ankle-foot, ankle-foot orthoses, walkers, canes..) were recorded at discharge. At follow-up patients were contacted by telephone and queried regarding the frequency and duration of use and if the patient discontinued using the orthoses the reason for discarding the device.
Results: One hundred and sixty-three (66 males, 97 females) patients were included in the study. Time since injury was 54.7±68.9 months and length of stay in the hospital was 82.6±52.4 months. Forty-two (25.8%) patients were tetraplegic (C4-T1), 87 (53.4%) were paraplegic (T2-T12) and 34 (20.9%) were conus-cauda equina syndrome (L1-S4). One hundred and seven patients were AIS A, 15 AIS B, 21 AIS C and 19 were AIS D. Of the 100 patients with prescribed orthoses at discharge, 62 (62%) continued to use it at home while 32 (32%) discarded the orthoses. The most common cited reasons for discarding a device was difficulty in donning and doffing, functional improvement and mechanical problems of the orthoses.
Discussion and conclusions: Ambulation after spinal cord injury is one of the primary goals the patients set for themselves. Assistive devices serve many functions to improve quality of life. Studies have shown the benefits of traditional assistive devices on gait when prescribed and used properly. However, periodic follow-up and patient education are essential for long term compliance.

OP290
FUNCTIONAL OUTCOMES IN SCI PATIENTS UNDERGOING ITB THERAPY

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Introduction. The functional situation of SCI (spinal cord injury) patients is not well established in literature. There are many studies that resume clinical examination and analytical outcomes, but don't specify their real difficulties in daily living. This data could be especially interesting in ITB (intrathecal baclofen) users. It could modify the actual criteria for implantation of the pump, since it has got implication in cost-effectiveness, cost-utility and their quality of life.
Purpose. To analyze the level of independence for displacements, transferences and ADLs of SCI patients undergoing ITB.
Methods. This is a cross-sectional study of SCI patients treated with ITB. In June 2015, 94 patients with ITB for treating spasticity secondary to SCI were followed at a Spinal Cord Injury Reference Hospital. Basic information, SCI characteristics and functional outcomes were collected from their electronic medical history.
Results. 76.60% of the patients were men, the mean age was 48.43 (CI 95%: 18.78-77.98) and the 75% of the patients were under 45 years when injury occurred. 37.2% of the patients were independent in ADLs (Activities of daily living), 29.8% partially dependents and 30.9% totally dependents. In transferences, 38.3% of the patients were independents, 12.8% partially dependents and 47.9% totally dependents. In terms of mobility, 48.9% were independents in self-propelled wheelchairs, 25.5% in electrical wheelchairs and 11.7% use both methods for displacements. On the other hand, 8.5% need external aid to move themselves.
Discussion and conclusions. Nearly 40% of SCI patients were independents for everyday activities and were in working age. This could be relevant for deciding therapeutical support and calculating the cost-effectiveness of treatments/assistive tecnhology. Moreover, it seems important to take into account their quality of life and caregivers charge since their life expectancy is increasing.

OP291
NEED OF MULTIDISCIPLINARY MANAGEMENT OF PATIENTS WITH TRAUMATIC AND NON-TRAUMATIC SPINAL CORD INJURY IN THE CHRONIC PHASE

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Aim: A retrospective study of patients with traumatic (TSCI) and non-traumatic (NTSCI) spinal cord injury (SCI), who visited our outpatient department, in order to analyze their demographic data and their healthcare needs in the chronic phase.
Method-Material: Files of patients who visited our outpatient department the past 12 months were reviewed. In 914 cases, were analyzed: the primary disease, the demographic data, and especially concerning the SCI patients their healthcare needs from different departments.
Results: The primary disease was, of neurological origin in 497 patients, of orthopedic origin in 403, of reumatological origin in 14, one day hospitalization needed 59 patients. Ninety one patients suffered SCI: 62.5%(57) were TSCI and 37.5%(34) were NTSCI with a mean value of 15.8 years post SCI, 53 men and 38 women with a mean age of 46.8 years. Paraplegia 73.6%(67), tetraplegia 26.4%(24). In 21 patients (23.4%) we needed consultation from a radiologist, in 8(8.8%) from a plastic surgeon, in 7(7.7%) from a urologist, in 3(3.3%) from a psychiatrist, in 2(2.3%) from a neurosurgeon, in 2(2.3%) from an infectious diseases' specialist, in 2(2.3%) from a surgeon, in 1 from an anesthesiologist, and in 1 from a gynecologist. In 4/91(4.4%) admission in another department was needed. Consultation from other than PRM specialty was done the same day as a rule.
Conclusions: Long term management of people with TSCI and NTSCI in a PRM department is necessary for maintaining functionality, prevention, timely diagnosis and treatment of complications of SCI (pressure ulcers, deregulation of proper bladder and bowel function e.t.c.) but also timely diagnosis of pathology that affects the general population and can be misdiagnosed due to sensory deficits in SCI patients. In the frame of a general hospital multidisciplinary team work facilitates effective management of these patients.

OP293
EFFECT OF CRYOTHERAPY PRIOR TO STATIC STRETCHING ON HAMSTRINGS EXTENSIBILITY: A FIVE CONSECUTIVE SESSIONS PROGRAM

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Introduction: Flexibility is desired to enhance the performance and reduce the likelihood of muscle injury. There are different techniques used to increase range of motion (ROM) and cryotherapy techniques are known to enhance flexibility gains. However, the combination of stretching and cryotherapy agents is still controversial.
Objective: Evaluate the effects of static stretch alone and with prior application of cryotherapy on hamstring extensibility.
Methodology: Forty-five sedentary subjects with hamstring retraction were randomly assigned in one of three intervention groups: 1) control, 2) 30-seconds static stretch once a day, and 3) 15-minutes static cryotherapy followed by 30-seconds static stretch once a day. Hamstring flexibility was evaluated by passive knee extension test at baseline and again following five consecutive days of intervention. Data were analyzed with a three intervention x two-evaluation moments factorial ANOVA with repeated measures and appropriate post-hoc analysis.
Results: Average extensibility improvement between evaluation moments was 18.5º (standard deviation: 5.01) in 30-seconds static stretch group and 27.6º (standard deviation: 6.03) in 15-minutes static cryotherapy followed by 30-seconds static stretch group. A significant interaction was observed between interventions and evaluation moments for hamstring extensibility ($p<0.001$). Statistically significant differences were found between evaluation moments ($p<0.001$) and between intervention groups ($p=0.005$). However, there was no statistically significant difference between static stretching with and without cryotherapy ($p=1.000$).
Conclusions: We can conclude that both stretching techniques are effective in hamstring extensibility. However, cryotherapy does not seem to improve the stretching results.

OP294
KNEE JOINT ANGLE INFLUENCES GASTROCNEMIUS NEUROMUSCULAR ACTIVITY DURING GEKO ELECTROSTIMULATON IN HEALTHY, OLDER ADULTS: A PILOT STUDY

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Introduction. The geko™ increases venous circulation by stimulating the common peroneal nerve (CPN), which in turn, activates an isometric, muscle-pump contraction of the calf. It is unclear whether leg position influences calf neuromuscular activity during geko™ stimulation.
Purpose. The study aimed to determine whether knee joint angle influences lower-limb neuromuscular activity during geko™ neuromuscular electrostimulation (NMES) in older adults.
Method. Fifteen community-dwelling, older adults (aged 59 – 83 yrs) underwent 60 min of geko™ NMES, with the lower-limb at three different knee angles (random order at: 0°, 45° and 90°, each 20 min). Surface EMG was acquired from the tibialis anterior (TA), peroneus longus (PL), medial (MG) and lateral gastrocnemius (LG), at each angle. Raw EMG signals were root mean square (RMS) processed, normalised (to maximal NMES twitch), and analysed for each knee angle at: 1, 10 and 20 minutes. One-way, Friedman's ANOVAs assessed RMS activity between each knee angle (0°, 45°, 90°); Wilcoxon Signed-Rank tests identified specific knee angle differences in RMS activity.
Results. Leg position did not affect the RMS activity of the TA (p=0.405) or PL (p=0.696) during electrostimulation. The MG RMS activity was influenced by leg position (p=0.002), with greater activity at 90° knee joint, than at 0° (p=0.031) and at 45° (p=0.003). Lateral gastrocnemius RMS activity was higher at 90° knee joint, than at 0° (p=0.004) and at 45° (p=0.003), and also higher at 45°, than at 0° (p=0.05).
Discussion and conclusions. Neuromuscular activity of TA and PL stimulated by the geko™, via the CPN, was not affected by leg position. Antagonist neuromuscular activity of gastrocnemius was influenced by leg position, with greater activity at 90° knee flexion, than at 45° (partial flexion) and 0° (full extension). Further work needs to evaluate whether change in gastrocnemius neuromuscular activity affects lower-limb venous circulation.

OP295
EFFECT OF KINESIO® TAPING ON KNEE POSITION SENSE AFTER QUADRICEPS EXERCISE INDUCED FATIGUE

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Introduction: Muscle fatigue is known to decrease proprioceptive acuity, potentially contributing to injuries. Kinesio® Taping (KT®) supports damaged structures while allowing mobility. However, KT® effects in some of the mechanisms associated with muscle fatigue, namely proprioception, are still controversial.
Objective: The aim of this study was to analyse the immediate effect of KT® on knee position sense after quadriceps exercise induced fatigue.
Methods: A randomized controlled trial was performed. Thirty volunteers were randomly assigned to two groups of 15 subjects each: control (20 min at rest) and KT® (KT® application over quadriceps muscle using a facilitation method with paper-off technique). Prior to the intervention, fatigue was induced in dominant-side knee using a standardized protocol. Knee joint position sense was assessed in two moments, before and after intervention, during passive repositioning tests (2º/s) at the target angle of 60° knee flexion using a isokinetic dynamometer (Biodex®) and without visual guidance. Absolute and variable repositioning errors (target angle – repositioned angle) were computed. Data were analysed with a two groups x two-evaluation moments repeated-measure ANOVA.
Results: There was no statistically significant effect on variable repositioning error. KT® group had a decreased in absolute error of 3.0º. For absolute error we found a significant interaction between interventions and evaluation moments (p=0.018). Statistically significant differences were found between evaluation moments (p=0.014) and between groups in the final evaluation (p=0.010).
Conclusions: The results support the use of KT® applied over the quadriceps muscle for compensating or preventing knee position sense deficits caused by muscle fatigue.

OP296
POWER AND FATIGUE MEASUREMENT OF THE SPATIALLY DISTRIBUTED SEQUENTIAL STIMULATION IN A DYNAMIC KNEE-EXTENSION TASK

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Introduction: Voluntary muscle contraction exploits asynchronous activation and neuromuscular circuits provide smooth contractions with steady power generation, but functional electrical stimulation (FES) employs a relatively crude approach. Spatially fixed activation gives a drop in force when the activated fibres fatigue.
Purpose: The aim of this study was to compare the power and fatigue properties of spatially distributed sequential stimulation (SDSS) against conventional single electrode stimulation (SES) in an isokinetic knee extension task simulating knee movement during recumbent cycling.
Method: M. vastus lateralis and medialis of eight able-bodied subjects were stimulated for 6 min on both legs with both setups (i.e. n=16). In the SES setup, target muscles were each stimulated by a pair of electrodes. In SDSS the cathode electrode was replaced by four small electrodes giving the same overall stimulation frequency and the same total surface area. Torque was measured during knee-extension movement by a dynamometer at an angular velocity of 110 deg/s. Mean power (Pmean) was calculated from all stimulated extensions and fatigue is presented as an index, calculated as the percentage decrease with respect to initial power. Pmean was scaled to a standardised reference input pulse width of 100 μs (Pmean,s).
Results: Pmean and Pmean,s were both significantly higher for SDSS than for SES (11.4±4.5 W vs. 9.1±4.8 W [mean ± s.d.], p=0.023, and 17.9±4.4 W vs. 9.9±3.8 W, p<0.0001, respectively). In contrast to SDSS, SES showed a significantly lower fatigue resistance (p=0.005). The scaling factor for SDSS was 1.6 and for SES it was 1.1, reflecting the substantially lower absolute mean stimulation intensity used with SDSS (62.5 vs. 90 μs).
Conclusions: Although less stimulation was applied, SDSS showed a significantly higher mean power output than SES. SDSS also had improved fatigue resistance when compared to conventional stimulation. The SDSS approach may provide substantial performance benefits for cyclical FES applications.

OP297
A COMPARISON OF MRI AND ELECTROMYOGRAPHY IN LUMBOSACRAL RADICULOPATHY

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Introduction: Lumbosacral radiculopathy affects approximately 3-5% of the population. The diagnosis is not always easy. Although there is no gold standard, a combination of history, physical examination, imaging and electrodiagnosis is usually used to make the diagnosis.
Purpose: to compare the accuracy of MRI and EMG in the diagnosis of lumbosacral radiculopathies;
Methods: Retrospective study including all patients with a clinically suspected lumbosacral radiculopathy admitted to the hospital during 1 year (2014).
Inclusion criteria: older than 18; performed MRI and EMG. Exclusion criteria: previous lumbosacral surgery; patients with documented peripheral neuropathy, myopathy and motor neuron disease. The statistical package for social sciences (SPSS) was used to analyze the data.
Results: A total of 131 patients were included; In 34% (n=45) of the cases, similar abnormal results were obtained both with MRI and EMG; normal results were obtained with both MRI and EMG in 30,5% (n=40); in 28,2% of the cases MRI was abnormal and no changes were detected with EMG; and in 0,02% (n=2) of the patients evaluated the EMG was abnormal and MRI was normal; we also verified that in 0,05% (n=6) of the cases, conflicting abnormal results were detected;
Discussion and conclusions: MRI is very sensitive in finding anatomic changes causing nerve root compression. However, it is not very specific and often shows compressive lesions in asymptomatic people. In addition, there are other causes of radiculopathy besides nerve root compression, which MRI cannot diagnose.
Regarding EMG, this measure has a hight specificity in the diagnosis and gives information about nerve function. Nevertheless, EMG has several limitations and can frequently result in false negatives.
This study supports the hypothesis that these two methods are complementary, and reinforce the importance of history taking and physical examination for a proper interpretation of the results.

OP299
EYEGRESS: HEMISPATIAL NEGLECT REHABILITATION THERAPY WITH IMMERSIVE VIRTUAL REALITY

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Introduction: Eyegress is a medical-oriented software development platform trying to bring the most recent advancements in Virtual Reality to healthcare workers all around the world, with a focus on Virtual Rehabilitation therapy. Hemispatial neglect is a deficit in attention to and awareness of one side of space after brain injury. It is defined by the inability of a person to process and perceive stimuli on one side of the body or environment, where that inability is not due to a lack of sensation.
Purpose: Our objective is to help patients access to the best care we can develope with Virtual Rehabilitation and we believe that providing free solutions to the initial barriers for virtual rehabilitition adoption is key for the advancement of the field.
Method: VRHB Island adventure is the first Immersive Virtual Rehabilitation Therapy available for hemispatial neglect**,** developed by the Eyegress VRHB Lab Development Team. In this therapy, the patient must find the treasure that will spawn around him, including the neglected side, combined with alternative analogical hemispatial neglect treatment strategies, to develop a well rounded multifaceted program. This therapy will be analyzed with a Likert-type questionnaire, QUEST and the Canadian Simulator sickness questionnaire.
Results: Results will be available before the congress date. For more information visit https://eyegress.wordpress.com
Discussion and conclusions: Virtual rehabilitation is an innovative and compelling application of a brand-new technology. It provides clinical practitioner with a new tool to treat their patient's deficits in a novel way. Eyegress Virtual Rehabilitation Therpies are an attractive options to challange the patient in a different enviroment, and they may also be useful for chronic patients, outpatient treatment, or for patients living on isolated areas or developing countries where getting similar therapies would be difficult or expensive.

OP300
DEVELOPMENT AND TESTING OF A COMPACT EMG MONITORING DEVICE FOR TELE-MEDICINE APPLICATIONS

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Introduction The article describes the first usability tests of a compact, portable and autonomous system for online monitoring of EMG signals. The usability tests were made with a prototype developed by the authors and aim to determine the system's viability for telemedicine applications.
Purpose The device aims to provide a situation during an online rehabilitation consultation through videocall where a patient with the device attached could be at home while a health professional in a distant clinic can ask the patient to perform certain movements and see the EMG results in real-time.
Method The system is composed of gel EMG electrodes connected to a compact box with a battery-powered mini-computer. The device connects to the Internet through WiFi or a cellphone network and provides a standard HTML5 webpage that can be viewed online. The EMG readings can be viewed in real-time through the provided webpage, so they can be easily accessed through the Internet by a multitude of devices (e.g. PC, tablet) without the need to install additional software. The device supports up to 6 different EMG readings. In order to simulate a telemedicine situation, the usability tests were made with the device's webpage working together with a standard Skype videocall. The system was evaluated in terms of its time delay between the muscle activation and its reading in the webpage using WiFi and 3G and accuracy of the EMG readings. These tests were performed on devices with different screen sizes and performance segments, and compared to a commercial setup from PLUX.
Results and conclusions Low-power mobile devices can only render one reading at a time with the current webpage. Testing within the same network showed a negligible delay, while the same test in a 3G environment shows a delay of over 5 seconds. Further software optimization is needed to provide a viable solution.

OP301
EFFECT OF AEROBIC AND RESISTANCE TRAINING OVER A 6-WEEK PERIOD ON BODY FAT IN MODERATELY TO SEVERELY OBESE PATIENTS.

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Introduction: Obesity, being a world epidemy, is responsible for an increased risk of mortality and various co-morbidities. The loss of weight, particularly of body fat, would lower this risk. This is why we have developed an aerobic and resistance training program over a 6 week period whose main goal is to reduce body fat by 5%.
Materials and Methods: We have assessed the evolution of body fat by bioelectrical impedance analysis, of VO2peak by a cardiac stress test on a cycle ergometer, of lower body muscular strength, of quality of life by the SF-36 health survey, in twenty sedentary, moderately to severely obese patients between the age of 18 and 70 years old, before and after a 6-week training program mixing aerobic and resistance exercises for 45 minutes, twice daily and 5 days per week, without hypocaloric diet. A follow at 3 and 6 months was perform on body fat.
Results: After the 6-week training program the body fat decreases of 9+/-4,7%. Muscular strengh increases of 15,8+/-13%, quality of life increases of 80,7+/-70% and VO2peak increases of 15,4+/-17,8. The follox shows a decrease of body fat at 3 and 6 months.
Discussion and conclusion: In patients with moderate to severe obesity, a mixed 6-week training program, without hypocaloric diet leads to a significant decline in body fat as well as an increase in VO2max and muscular strength.

POSTER PRESENTATIONS

PP001
PAIN MANAGEMENT OF HETEROTOPIC OSSIFICATION IN A PATIENT WITH HEMORRHAGIC CEREBROVASCULAR ACCIDENT (CVA) WITH PROLO-THERAPY. A CASE REPORT

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Introduction: Prolo-therapy was presented as an innovative therapeutic approach for several types of pain a few years ago.
Purpose: In this study we present the application of prolo-therapy on a patient with hemorrhagic cerebrovascular accident (CVA) with heterotopic ossification at the hemiplegic hip joint in order to reduce the pain intervening in his rehabilitation program.
Method: A 68 y.o male patient with hemorrhagic CVA was inpatient in our department 62 days after the onset with right hemiplegia and heterotopic ossification at right hip joint. The initial range of movement (ROM) of the joint was severely reduced nearly to no motion at all, accompanied with pain preventing further movement and sitting. As a result this hampered patient's participation in his rehabilitation program. We injected Dextrose solution 5% 0,1 ml endodermally at the painful sites of the adductor muscles and the painful area surrounding the joint. The injections were applied once weekly and for 6 weeks. ROM of the joint was measured prior, during and at the end of the therapeutic application. Also we conducted X-rays and MRI of the hip and taken photos of the patient prior, during and at the end of the therapy. After each session the patient was participating in his rehabilitation program.
Results: Prolo-therapy reduced pain, facilitating the rehabilitation program, increasing the ROM from 10 degrees to nearly 45 degrees at the end of the intervention, improving sitting and standing position, gait training, walking ability and also stair climbing.
Discussion and conclusions: We applied this technique as a new clinical innovation. The results were surprising for us.

PP003
THE INFLUENCE OF ELECTROPHORESIS BENFOTIAMINE TO SPEED RECOVERY OF PERIPHERAL NERVE

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Introduction. Peripheral neuropathy presents damage of peripheral nerve system, which can cause a variety of symptoms (such as neurophatic pain, muscle weakness,paresthesia etc.)
Aim. Determining the efficiency of the application of electrophoresis benfotiamine to faster recovery of peripheral nerve. To determine whether to faster and better recovery occurred after applying electrophoresis benfotiamine compared to other physical procedures.
Material and Methods. The study was conducted as a prospective study and included 56 patients. The experimental group consisted of 26 patients, of whom 12 were females and 14 males (mean age 52.3 years). The control group consisted of 30 patients, of whom 21 were females and 9 males (mean age 51.2 years). Data were obtained from medical records, using a questionnaire (DN4, VAS, Pain DETECT, a questionnaire on the superficial sensibility) and by measuring muscle strength, range of motion and EMNG findings.
Results. Based on the research in this paper, we found that there were statistically significant differences between all of the data obtained in patients who received benfotiamine electrophoresis. There is a functional recovery in terms of muscle strength and range of motion. Compared to other physical procedures that were used in the control group, electrophoresis benfotiamine had a better effect in the tested areas, but this difference was not statistically significant between all data.
Conclusions. There have been significant improvement in the patient after electrophoresis benfotiamine. Compared to the control group, the results show that there has been a faster and better recovery after treatment with benfotiamine.

PP004
IMPORTANCE OF EARLY REHABILITATION IN SURGICALLY TREATED PATIENTS WITH ABDOMINAL PATHOLOGY IN INTENSIVE CARE UNITS

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Purpose of our study was to analyze and point out the importance of early rehabilitation of surgically treated patients with abdominal pathology.
Methods: We have evaluated 36 patients with cholecistitis, 42 patients with appendicitis and 27 patients that underwent gastrectomy. Rehabilitation parameters that were analyzed included: breathing exercises and percussion drainage (Group 1), respiratory rehabilitation (Group 2), verticalization (Group 3) and kinesiotherapy (Group 4). Separately the length of treatment was analyzes.
Results: We found statistically significant difference in distribution of evaluated parameters ($p<0.05$) with significantly lower d for Group 2 exercises. The length of treatment in these patients significantly differed as well ($p<0.01$) with lowest duration for patients with appendicitis (2.83±1.37 days) and longest for patients underwent gastrectomy (5.88±1.97 days).
Conclusions: Early rehabilitation should have individual assessed and planned with regards to tehe patients pathology and condition, it schould be multidisciplinary and continuously monitored and evaluated everyday by board certified specialist.

PP005
MALNUTRITION IN THE ICU OF RIGA EAST UNIVERSITY HOSPITAL

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Introduction: Prevalence of malnutrition in intensive care units (ICU) worldwide is 30-50% [Powers, 2014]. Critically ill patients are prone to malnutrition that leads to the loss of body mass and is associated with a bad clinical outcome, prolonged hospital stay and increased health care costs [Nematy, 2012]. Nutrition screening can help detect patients who are at risk of malnutrition or have existing nutritional problems [Agarwal, 2012].
Purpose: Identify prevalence of malnutrition in ICU of Riga East University hospital.
Methods: 146 patients were evaluated during first 24 h in ICU. 70 patients were re-evaluated every third day. NUTRIC score, Nutritional risk screen (NRS) and Subjective Global Assessment (SGA) were used. Body fat percentage (BFP) was calculated using Durnin-Womersley's and Siri's equations. Paired and independent T-test was used for statistical analysis with a confidence interval 95%.
Results: Malnutrition incidence was 27,4% (NUTRIC) and 59,6% (NRS). BFP decreased in 5 days from 29.18% SD=9.88% to 26.45% SD=9.73%, N=8, p=0.001 in high NUTRIC score patients and from 25.39% SD=10.14% to 23.90% SD=9.89%, N=26, p=0.005 in low NUTRIC score patients. There is no statistical difference in relative decrease of BFP between low and high NUTRIC score groups (-0.06% SD=0.09% vs -0.11% SD=0.05%, p=0.175). There is a decrease in BFP from 25.97% SD=9.30% to 24.14% SD=9.30%, N=22, p=0.001 in patients at risk according to NRS and from 26.84% SD=11.98% to 25.04% SD=10.98%, N=12 p=0.005 in patients that are not at risk. There was no statistical difference in relative decrease of BFP between patients that are and are not at risk according to NRS (-0.06% SD=0.04% vs -0.08% SD=0.10%, p=0.643).
Discussion and conclusions: Regardless of the risk, decrease in BFP was observed, probably due to a faster discharge of a low-risk group or a better nutritional supplement of the high-risk group.

PP006
BIOCHEMICAL PROFILE AND EPIDEMIOLOGICAL CHARACTERISTICS OF HOSPITALIZED PATIENTS WITH STROKE IN A REHABILITATION DEPARTMENT

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Introduction: There is growing evidence for an association between serum uric acid and cholesterole in stroke, although in many studies the role of uric acid as a risk factor for vascular disease is controversial.
Purpose: To examine epidemiological data and risk factors in hospitalized patients with stroke. The association between lipid profile, uric acid, glucose, renal function, diabetes mellitus and ischemic/hemorrhagic stroke was assessed in hospitalized stroke patients in a PRM department.
Methods: We studied 50 patients with stroke during the first 6 months of 2015. Clinical records of patients were investigated. Laboratory assessment included fasting blood samples for determination of glucose, total cholesterole, triglycerides, High Density Lipoprotein-Cholesterol(HDL-C), Low Density Lipoprotein-Cholesterol(LDL-C), uric acid(UA) and creatinine.
Results: The percentage of patients with ischemic stroke was 84% (mean age 69) and with hemorrhagic stroke 16% (mean age 53). From Diabetes Mellitus were suffering 26,5% of the patients and from chronic renal failure 14%. Increased serum UA concentrations were measured in 30% of patients. In 17,8% of patients the levels of total cholesterol were above 220mg%, in 15.6% were 200-220mg%, in 66.7% were <200mg% and in 33,3% were <150 mg%. In 28,9% of patients the levels of triglycerides were over 150mg%. HDL-C concentrations <30 mg% were found in 31.1%, 31-40 mg% in 48,9% and 41-50 mg% in 15,6% of patients. Ldl-C>100 mg% had 53,3%, <100 mg% had 44,4% and >160 mg% had 17,8% of patients.
Discussion: The proportion of patients with diabetes mellitus was high. The percentage of patients with abnormal total cholesterol levels (33,3%) was low. Low levels of HDL were associated with stroke risk (80% of patients had pathological values HDL-C). The percentage of patients with increased UA concentrations was high (30.3%).
Conclusions: Lipids have contribution to stroke risk, with a more prevalent role for HDL than LDL.

PP007
MAXIMUM PHONATION TIME AT PATIENTS WITH PARKINSON'S DISEASE

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Introduction: The most author estimate that 60-80% of patients with Parkinson disease (PD) will develop speech and voice deficits as the disease progresses. Duration and intensity of voice depends on functions of respiration , vocal cords and articulation.
The aim of the work is to explore differences in ability of phonation duration at patients with PD, compred to two control groups of different age. We compared relationship between maximum phonation time (MPT) and time when first symptoms of disease appeared and speech disturbance in group with PD.
Methods: The sample consists of three groups: 1. Patients with PD. 2. Health adults and 3. Younger adults (students). The task for the examinees was maximally long to produce vowel "A" after one deep breath, in three attempts. Average duration phonation was count and results between groups were compared. For the patients with PD results were put in relation to time when first symptoms appeared and degree of speech disturbance.
Results and discussion Average age patients with PD (N=22) were 70.86, average MPT=11.29 sec. (male =12.81 sec., female = 9.09 sec.). Average age for healthy adults (N=24) were 70.54, average MPT=20.16 sec. (male = 23.92 sec., female =16.41 sec.). Average age for students (N=24) were 24.75, average MPT=21.57 sec. (male = 29.35 sec., female = 16.32 sec.). Pearson Correlation length of time from onset of symptoms and the average MPT in the first group of patients was r=0,527, p=0.05. 77.27% of patients in the group with PD had speech impairments varying degrees. Normal speech had 5 patients (MPT=13.33 sec). 15 patients with mildly speech impairments had MPT=11.49 sec. Two patients with severely speech impairments had MPT 4.66 sec.
Conclusions MPT persons with PD is importantly shorter compared to examinees from both control groups (p=0.000). Time since first symptoms appeared and level of speech disturbance impact to duration of MPT.

PP008
COGNITIVE FEEDBACK: A NEW THEORITICAL APPROACH FOR RETRAINING IN NEUROREHABILITATION USING A VIRTUAL MIRROR

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Introduction: Feedback (fb) is concerned as the basic element in training and learning process of a new motor and cognitive activity, or in retraining of an activity that has been affected or lost. Fb is the basic tool for the therapist, to communicate with the internal neuronal circuits, which are responsible for an activity, or to attempt to modulate them, through neurorehabilitation. The fb from the "virtual reality" requires sufficient cognitive ability and represents a peripheral "cognitive" stimulus, that is operated by the cognitive aspects in order to affect the mental expression or representation of this specific virtual activity.
Methods: Every activity in the virtual reality offers a specific cognitive stimulus, and consequently stimulation, the way it is presented can be perceived as "virtual mirror". The contribution of the therapist must be oriented in the recognition of every suggested cognitive stimulus, such as attention, awareness, calculation, assessment, recall, concentration, etc, in order to affect a) the identification and recognition of real dimension and "architecture" of the virtual activity, b) the successful decoding, mental programming and integration of the presented activity, as it is expressed through the virtual reality environment and c) the improvement of the specific virtual action with the effort of the cognitive fb, in real-time conditions. Using the above means through virtual mirror, can redefine patient's movement perception in space, constituting a prospective therapeutic tool.
Discussion: This theoretical approach suggests the therapeutic use of the "cognitive stimulus" (arrived peripherally from virtual activity), which must be identified through a) the decoding of the virtual reality activity, b) the action in the enriched virtual environment, or c) a task oriented video game. The focused use of "cognitive fb" helps in better understanding of virtual activity and to its integration in the everyday retraining in the field of neurorehabilitation.

PP009
LIFESTYLE CHANGE: HABIT GOAL SETTING TO REDUCE CARDIOVASCULAR RISK

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Introduction: Life style in terms of exposure to tobacco, unhealthy eating and physical inactivity is the major determinant of cardiovascular diseases (CVD) developing in families. Cardiac and circulatory diseases form the most significant public health problem in Latvia and one of the most important in the whole world. The cheapest, reachable way to perform it is to change the lifestyle habits - behavior that has been repeated until it has become more or less automatic, enacted without purposeful thinking. In order to change and maintain the habit there is a need to implement new habits by choosing new habit goals.
Purpose: To clarify how people form the habit goals and which are most often chosen in order to reduce cardiovascular risk.
Methods: The study included 207 participants from the general population in the range 30-65 age without previously diagnosed CVD. They were screened for cardiovascular risks (CVR) and randomized into 2 groups – one control (n=103) and one active (n=104). 82 participants of active group continued preventive rehabilitation, during 10 weeks once a week receiving educational lectures about CVD prevention, and were leaded in physical activities in groups, and were asked to set the individual habit changing goal every week.
Results: Although many seemingly poorly-specified habit goals were set at the beginning, goals were achieved and sustained during the 3 months for all behaviors. Physical activity increase was set as primary aim for 34% (n=28), 15% (n=12) set to increase use of water and 12% (n=10) were willing to reduce salt consumption.
Discussions and conclusions: Even knowing the CVR factors and its contributors there is great difficulty for people to formulate and choose the aim. In order to implement life style changes and maintain them in population there is need to give already formulated and prepared aims.

PP010
PROCEDURE OF TRACHEOSTOMY TUBE REMOVAL IN ICU/HDU PATIENTS DURING REHABILITATION: OUR EXPERIENCE

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Introduction: ICU patients need rehabilitation in specialized high dependency units (HDUs), with tracheostomy tube removal (decannulation) being one of the priority goals.
Purpose: To present our protocol of decannulation.
Methods: Fifty-six patients were admitted to our HDU during 2014, suffering from stroke (22), traumatic brain injury (10), hypoxic encephalopathy (8), severe heart diseases (6), spinal cord injury (3), other (7). Of them, 48 had a tracheostomy, 22 a gastrostomy and 31 a nasogastric tube. All patients followed an intensive rehabilitation program, carried out by a multidisciplinary team, taking certain steps:

- gradual weaning from the ventilator, until spontaneous breathing
- gradual reduction of administered oxygen
- fiberoptic endoscopic evaluation of swallowing (FEES), decisive for the next steps
- deflating the cuff and placing an occlusion cap, during speech therapy sessions at first, and gradually increasing the time of maintaining the cap.

We evaluated the initial level of consciousness with Glasgow Coma Scale (GCS), the time between disease onset and rehabilitation program initiation, HDU stay, the time of tracheostomy and feeding tube removal.
Results: Patients with initial GCS between 3-7/15 were 10, 8-9/15: 13, 10-11/15: 22 and 15/15: 3. The mean time between disease onset and rehabilitation program initiation was 60.6 days. Thirty-four patients were transferred to the ward. The mean HDU stay was 42.2 days. The tracheostomy tube was successfully removed in 20 patients - the mean time for the removal was 90.6 days. The gastrostomy/nasogastric tube was successfully removed in 22 patients - the mean time for the removal was 99.3 days.
Conclusions: Rehabilitation of critically ill patients with tracheostomy requires close cooperation of a multidisciplinary team, along with the observance of certain procedures and steps, for the safe removal of the tracheostomy tube. A better initial level of consciousness on admission seems to promote the final goal.

PP011
CYSTIC FIBROSIS AND PHYSICAL EXERCISE

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Introduction: Cystic fibrosis (CF) is the most common autosomal recessive lethal hereditary disorder in Caucasians. Is caused by mutations in the cystic fibrosis transmembrane conductance regulator gene. The clinical consequences include multi-system disease, characterised by progressive pulmonary damage leading to respiratory failure, pancreatic dysfunction, liver disease, gut motility problems and elevated sweat electolytes. Physical activity and exercise training play an important role in the clinical management of patients with CF. Physical exercise has become an important part of the physiotherapy treatment. Whether physical exercise is to be used in order to maintain function, prevent dyfunction or rehabilitate what has been lost. Regular exercise training is associated with higher pulmonary function and enhanced airway mucus clearance.
Purpose: Study the association of patients with CF and the practice of physical exercise.
Methods: A systematic review of the literature about "Cystic fibrosis" and "physical activity" was conducted using the PUBMED.
Results, discussion and conclusions: Physical activity is well recognized as part of health care and rehabilitation programmes in CF. Higher levels of habitual activity have been associated with higher aerobic and anaerobic capacity, a better quality of life and improved survival. However the relationship between activity and health are still poorly understood and more studies are needed. The physical exercise programs and types of exercises used should be individually tailored, taking into account age, nutritional condition, interests, physical capability and current pulmonary condition. Key words: Cystic fibrosis, physical activity, exercise training

PP012
CHARACTERIZATION AND EPIDEMIOLOGY OF FALLS DURING HOSPITALIZATION IN A GROUP OF PATIENTS

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Introduction: Falls occurs in 25-30% of people over the age of 65 each year. This number increases in hospitalized patients and 30-60% of them experienced recurrent falls. An interaction of biological, behavioural, environmental and socioeconomic factors can lead to fractures or Postfall syndrome with dependence, loss of autonomy, immobilization, with restriction in daily activities and even death. The impacts and costs are increasingly significant with consequences for the Healthcare System, family and community.
Purpose: Characterization and epidemiology of falls during hospitalization in a group of patients.
Material and methods Observational study, using Hospital statistic data of the patients who had a fall during the hospitalization. These patients were hospitalized in the time period between January 1st and December 31st in the year of 2012. The results were statistically analysed using the Statistical Package for the Social Sciences version 18 of Windows.
Results: 91 patients (51,6% male, 48,4% female) had a fall during the hospitalization. 46% are aged between 61 and 80 years old. 29% were hospitalized with Cancer diagnosis and 16% for Traumatolgy. 25% stayed in the Hospital for a period between 6 to 15 days. 47% of the falls occurred between 12 p.m. and 8 a.m..60.5% happenned on their Hospital room. Only 29% of them had history of fall when home. 50% of patients returned home and 22% died.
Discussion and conclusions: It is very important to recognize the risk factors, such as age, sex, comorbidities, time period or previous fall history in hospitalized group of patients for a good protection. It is highly necessary and recommended the development and implementation a fall prevention program and educate patients and families on measures to prevent falls and promote safety.

PP013
SAVING WORKING HOURS AND HYGIENE COSTS WHILE USING DISPOSABLE FIXING FILMS FOR ELECTRODES DURING THE ELECTROTHERAPY

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Introduction So far, in physical therapy elastic bandages and rubber straps were used for fastening the electrodes for the electrotherapy. However, these methods are not optimal due to hygienic and economic causes. After each application elastic bandages have to be reprocessed and rubber straps have to be cleaned and disinfected.
Purpose In order to save working time and costs, we developed and patented a disposable fixing film for electrodes, which can be used for the short-term application in the physical medicine and sticks to itself due to adhesion.
Method On the basis of extensive clinical tests and researches in my specialist ordination for physical medicine and general rehabilitation, the product was tested and the evidence of saved working time and costs was proved.
Results During the usage of disposable fixing films for electrodes the results showed, that more than 2 minutes working time can be saved and at the same time costs for the cleaning process (washing agents, energy, water, etc.) can be saved, because the films can simply be disposed of.
Conclusions The disposable fixing films for electrodes for the short-term usage for the physical medicine is a cost-efficient disposable product, which saves working time and economic costs due to the loss of reprocessing the material. In conclusion, saving working time is significantly higher than the costs for the disposable fixing films for electrodes.
Declaration of conflict of interest: The author is the owner of the patent for disposable fixing films for electrodes for the electrotherapy.

PP014
THE APPLICATION OF LASER BIOSTIMULATION IN PERIPHERAL FACIAL PALSY REHABILITATION

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Introduction: The facial palsy is the loss of motor control in the same part of the facial nerve lesion, the most common cause is could exposure.
Objectives: We aimed to evaluate the effectiveness of laser biostimulation applied to the affected hemi face to reduce recovery time and getting some optimal parameters.
Material and methods: The study included 35 patients between September 2012-September 2015, of which 28 had an "a frigore" facial palsy, 3 patients were diabetic, but paralysis occurred after exposure to cold. 7 cases were considered diabetic neuropathy; in that patients' history it was not found any exposure to cold either air currents or air conditioning. All patients received electrotherapy galvanic and exponential currents, massage, and kinetic therapy-occupational therapy. Patients were divided into 2 lots: Lot A which remained with the presented therapy, and group B where applied to specific points to stimulate, was laser therapy for 1 minute. Rehabilitation program lasted 10 days. Patients were evaluated neurological, initially and the end of program. Recovery phase was repeated at 2 weeks on the same program, changing only the parameters of electro stimulation, as obtained from stimulating response. At the end of this stage the patients were evaluated again. It used muscle testing scale and evaluation of paresis on a scale of 0 to 5.
Results: The group that followed only electro stimulation presented increased muscle strength from 0 to 3.08, and group B obtained values of 4.1, at the first assessment. After the second recovery phase group A had reached values of 3.8, group B of 4.5. The lowest were recorded in patients with diabetes, especially those which had no exposure to cold.
Conclusions: Removing cases of diabetes, to final assess, the additional laser stimulation has proven to have a superior efficiency to the usual only classical electro stimulation.

PP015
EFFECT OF THERAPEUTIC ULTRASOUND ON PAIN INTENSITY AND QUALITY OF LIFE IN PERSONS WITH KNEE OSTEOARTHRITIS

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Introduction: The OA is a chronic and degenerative disease. To decrease the pain and improvement the functional limitation and QOL are the main goals of the physical therapy treatment. Purpose: To evaluate the effect of 5 and 10 sessions of TUS on pain intensity (rest, palpation and after functional activities) and QOL in persons with knee OA.
Methods: Quasi-experimental study with three assessments: at baseline (T0), at the end of 10th session (T2) and at the end of the 5th session (T1). The sample size calculation (power of 80%, a significance level of 5%) determined a sample size between 15 and 20 participants. Participants received 10 sessions of pulsed TUS, temporal average intensity: 0.6 W/cm2, ERA: 10 cm2, BNR 6:1. The treatment area corresponded to 2 times the ERA demarcated in the medial and lateral compartment of the knee.
Results: We evaluated 17 participants (61.4±6 years) with disease severity grade II and III (scale of Kellgren & Lawrence). Pain intensity at rest and to palpation showed significant decrease between T0, T1, T2 as well as between T0 and T2. In addition, at 5th session of intervention (comparison T0 and T1) was observed significant reduction in pain intensity. The QOL showed a significant improvement (T0 vs. T2) for pain intensity, mental health, physical activity and social activities.
Discussion and Conclusion: TUS reduced significantly the intensity of pain at rest, to palpation, and at functional activities and had a positive impact on QOL (pain, physical activity and social activities). These findings support the use of TUS in people with knee OA in clinical settings and indicate the importance for include this physical modality during the rehabilitation. However, future studies are necessary to evaluate the TUS effect over time and in combination with the therapeutic exercise, looking for an enhanced effect of this modality.

PP016
ULTRASOUND THERAPY IN LOW BACK PAIN - COMPARING DIFFERENT DOSES.

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Introduction: Low back pain (LBP) affects almost everyone, at least once in their lives [1], [2].
Purpose: The study design was a randomized prospective study that evaluated the efficacy of two different dosages of ultrasound therapy (UD) for LBP.
Methods: The study design was a cohort trial that compared two different UD dosages to a control group. Ninety two patients, 73 women and 19 men, aged from 30 to 65 years with chronic lumbar pain were examined. Inclusion criteria: pain in the lumbosacral area lasting more than 8 weeks, features of osteoarthritis in imaging studies, age 30- 65 years.The exclusion criteria: radicular pain, nonmechanical cause of pain (cancer , inflammation), contraindications for UD, any other LBP therapy conducted during the study.To evaluate disability the Oswestry Disability Index (ODI) was used. To asses pain intensity we used Visual Analog Scale (VAS). Patients enrolled in the study were divided into three groups: the first group- A (30 subjects) underwent ten ultrasound treatment sessions of intensity 1W/cm2, lasting 6 minutes, the continuous stream, area- lumbar paraspinal muscles of the spine. Second group- B (32 subjects)- underwent ten ultrasound treatment sessions of intensity 0,5W/cm2, lasting 6 minutes, the continuous stream, area- lumbar paraspinal muscles of the spine. Control group- (30 subjects) - did not receive any physiotherapy.
Results: Significant reduction in ODI and VAS score was seen in both study groups using T- Student test, X^2 test. In control group no significant change occured.
Discussion and conclusions: Many issues related to LBP, incluing its diagnosis and treatment, are yet to be solved. Ultrasound therapy gives promising results in decreasing disability level and pain intensity, however it is important to determine the effective parameters of the treatment because it seems that effectiveness depends on used dosages.

PP017
HEATING PROPERTIES OF RESONANT CAVITY APPLICATOR WITH ANGLE-ADJUSTABLE ELECTROMAGNETIC SHIELDS FOR THERMOTHERAPY OF OSTEOARTHRITIS

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Introduction In our research, we proposed a new heating method for treating osteoarthritis (OA) inside the human knee using a resonant cavity applicator. In clinics, a microwave diathermy system is widely used for thermotherapy of musculoskeletal disorders. For effective treatment of OA, the deep-seated joint cavity should be heated to approximately 36 to 38° C. In this research, a new resonant cavity applicator for deeper thermotherapy of OA was developed. The resulting temperature distributions inside the anatomical knee model using both resonant cavity applicator and a microwave diathermy system were compared and discussed.
Purpose In our previous method, OA patients had to extend their knee for treatment. Because OA patients find it hard to extend the knee, we proposed a new heating method using a resonant cavity applicator with angle-adjustable electromagnetic shields. In this new heating system, patients can insert their leg in a bent position and their knee can be heated by electromagnetic energy.
Methods First, we constructed a 3D anatomical human knee model from 2D medical images. Second, temperature distributions were calculated using the finite element method (FEM) with the knee model. Third, the estimated temperature distributions with the developed applicator were compared with the results of a microwave diathermy system.
Results In the calculated results for a microwave diathermy system, the penetration depth of the heating energy was approximately 20mm. In contrast, the results for the resonant cavity applicator show that the heating power was concentrated on the deep tissue inside the joint, about 60mm deep.
Discussion and conclusions From the estimated results, it was found that the proposed heating method is able to heat the deep tissue with the leg in a bent position. Furthermore, the hot spot can be controlled by adjusting the electromagnetic shield's angle.

PP018
DEVELOPMENT OF RESONANT CAVITY APPLICATOR FOR DEEPLY THERMAL REHABILITATION OF OSTEOARTHRITIS

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Introduction For effective thermotherapy of Osteoarthritis (OA), the deep tissue of the knee joint must be heated to 36-38°C. Current therapeutic methods, such as paraffin baths, hot packs, or microwave diathermy systems heat less than approximately 20mm deep into the knee. Therefore, we proposed a new deeply heating system using a small resonant cavity applicator for more effective thermotherapy of OA.
Purpose The purpose of this study is to develop a new effective thermotherapy applicator which can heat the deep region of the human knee with a cylindrical cavity applicator. The proposed resonant cavity applicator can concentrate the electromagnetic energy on the center of the applicator in electromagnetic resonance mode. In this study, we develop a prototype cavity applicator and experiment with an agar phantom shaped like a human leg.
Methods The cavity is 300mm in diameter and 400mm in height. This applicator has two openings in order to insert the leg in a bent position. To concentrate the heating energy on the deep region of the knee, two inner electrodes are used. In order to protect the healthy tissue from electromagnetic energy, the shields, which are connected to the cavity wall, cover the thigh and calf region. In experiments, the heating power was set to 30W and the heating time was 10min. After the experiment, we take thermal images of the center of the phantom by an infrared thermal camera.
Results From the heating results, it was shown that the deep region of the agar phantom, which is an effective region for thermotherapy of OA, was heated optimally. The temperature increase is approximately 6°C.
Discussions and conclusions Our experimental results show that the proposed new applicator was effective in heating deep tissue of the knee. This method can be used in the clinical therapy of patients with OA.

PP019
EFFECT OF ENDURANCE TRAINING, CONTINUOUS OR INTERVAL ON PERIPHERAL BDNF LEVEL IN HUMANS WITH OR WITHOUT DISORDER. REVIEW

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Introduction: Brain-derived neurotrophic factor (BDNF) is a protein which promotes the survival of hippocampus and neocortical neurons.
Purpose: The aim of this study will be inspect if the modality of training "continuous or interval" affect the peripheral BDNF level.
Methods: We searched the following electronic databases: PubMed, Web of Knowledge, Science direct, and Medline. The thematic search used to find the studies were variants of endurance training, chronic exercise, aerobic fitness, brain-derived neurotrophic factor. Within each of the identified studies, several variables were evaluated to determine if there is an association between exercise and changes in BDNF levels from pre-training to post-training.
Results: Twenty one publications have relived, based on specific criteria and 1002 subjects included in total (mean age = 52 ± 17). All the studies demonstrated that peripheral BDNF were increase significantly after an interval training protocol. Sixty percents of studies using continuous training protocol showed a significant increase of peripheral BDNF level.
Discussion: In interval training, the intensity and training work load could be an important factor in amplitude of BDNF response to training. Different studies showed that exist a positively correlation between Body mass Index and serum BDNF, which can explained that endurance training induced a decreasing trend of serum BDNF level, in metabolic syndrome and diabetic type 2. BDNF expression is reduced in the elderly, mild cognitive impairment, Parkinson's disease, Alzheimer's disease and psychiatric disorders. Aerobic exercises play a protective role by attenuating progression of cognitive symptoms and play a preventive role
Conclusions: The effect of continuous training on peripheral BDNF level is more contrasted than interval training. Different elements can prevent a modification of BDNF level after a training period.

PP020
MENTAL PRACTICE EFFECT IN MULTIDIRECTIONAL FUNCTIONAL REACH AND GRIP STRENGTH IN ADULT SPINAL CORD INJURED PATIENTS, BASKETBALL ATHLETES – CASE SERIES

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Introduction: There is evidence of the positive effects concerning mental practice in the motor performance and optimization of motor function in athletes, healthy individuals and stroke patients. However, the benefits in spinal cord injured patients are still unknown.
Purpose: To verify the effect of a mental practice program on the functional reach (anterior and lateral) and grip strength in spinal cord injured basketball athletes.
Methods: A repeated-measurement within-subjects design was used. The sample involved four male basketball athletes, aged between 30 and 32, whose functional level was between T3 and L2. Patients underwent 3 mental practice sessions which lasted 15min throughout 6-weeks: training with audio help in the presence of a physiotherapist twice a week and once a week at home with the aid of a descriptive mental training. The grip strength of the dominant hand and the anterior and lateral modified functional reach test were assessed in three different moments: baseline (m0- before a 6-week period without mental practice) pre-treatment (m1) and post-treatment (m2).
Results: All patients exhibited stable motor deficits between m0 and m1 and clinical improvement between m1 and m2 in both the anterior and lateral modified functional reach test, more noticeable in the anterior range (gains between 0.9 and 3.0 cm) than in the lateral (gains between 0.4 cm and 1.9 cm). In terms of grip strength, no differences were found.
Discussion and conclusions: Despite no efficacy in grip strength, mental practice seems to improve anterior and lateral functional reach. Nonetheless, conclusions must be carefully taken into consideration, since the gains did not constitute minimal clinical important differences and because of the limited number of patients. Large trials of mental practice in this population are warranted.

PP021
EFFECT OF NORDIC WALKING ON BODY COMPOSITION AND EXERCISE TOLERANCE IN OVERWEIGHT AND OBESE ADOLESCENTS

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Introduction. Obesity is rampantly increasing throughout the world and needs to be detected and treated early to prevent non-communicable diseases like diabetes, hypertension and cardiovascular diseases in adulthood. Obesity in Lithuania hasn't reached epidemic proportions in comparison with other countries, but is becoming a growing problem. Different exercise programs are used for obesity treatment.
Purpose – was to determine and compare the effect of Nordic walking and walking without poles on body composition and exercise tolerance in overweight and obese adolescents.
Methods: 40 adolescents (20 boys, and 20 girls) from 12 to 16 yrs. with overweight (BMI>85 percentile) or obesity (BMI>95 percentile) were randomly divided into two groups: investigative (Nordic walking) and control (walking without poles). Anthropometry, 6 min. walk test were used, and VO2max was calculated. The study was carried out in sanatorium, where duration of treatment 3 weeks.
Results: after intervention all measured indicators in Nordic walking and walk group got better respectively: body weight decreased 2.91kg/2.32kg, body mass index decreased 0.99kg/m^2/0.84kg/m^2, body fat percentage decreased 2.03%/1.51%, body muscle percentage increased 0.80%/ 0.54%, waist circumference decreased 2.35cm/2.20cm, hip circumference decreased 1.85cm/1.60cm, the 6-minute walk distance increased 26.35m/22,85m, and maximum oxygen consumption increased by 0.74 ml/kg/min/0.64ml/kg/min.
Discussion and conclusions. After intervention body mass index, body fat percentage, waist and hip circumference decreased significantly, body muscle percentage and exercise tolerance increased significantly in Nordic walk group as well as in walk group, but significant differences between these two groups were not observed. Nordic walking as well as walking without poles are effective means in reducing body weight and increasing exercise tolerance, and can be used in obesity management.

PP022
ELECTRICAL NERVE STIMULATION AFFECTS LOWER-LEG NEUROMUSCULAR ACTIVITY, BUT NOT BALANCE ABILITY, IN HEALTHY, OLDER ADULTS

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Introduction – Neuromuscular electrical stimulation (NMES) of the common peroneal nerve can promote lower-leg circulation, by intermittently initiating ankle dorsiflexion and eversion, and thus stimulating the calf muscle-pump. It is unclear whether this muscle activity affects balance ability.
Purpose – The study aimed to determine the effects of calf NMES to alter i) balance ability and, ii) lower-limb neuromuscular activity during balance tests.
Method – Fifteen healthy, older adults (age 66 ± 8 yrs) received 60 min of NMES using a geko™ device. Participants performed the Frailty and Injuries: Cooperative Studies of Intervention Techniques–4 (FICSIT-4) balance test before and after NMES. Balance score and time were recorded with eyes open, and closed, with feet: parallel, semi-tandem, tandem and one-legged. Surface EMG activity was recorded in each position from tibialis anterior (TA), peroneus longus (PL), medial gastrocnemius (MG) and lateral gastrocnemius (LG) of the non-dominant leg. Filtered EMG signals were root mean square (RMS)-processed and normalised to participant maximal NMES twitch. Wilcoxon Signed-Rank tests compared pre and post-NMES differences in balance scores, balance times, and individual muscle EMG activity in each position.
Results – After 60 min of NMES there was no difference in FICSIT-4 balance score (pre 24.9 ± 2.3; post 25.3 ± 2.8; p=0.4) or balance times in each standing position. There were no changes in TA and PL EMG activity for each position during the FICSIT-4 test. However, EMG activity was reduced for the MG in feet parallel (eyes closed; p=0.02) and semi-tandem (eyes open; p=0.05) positions, and for LG in one-legged balance (eyes open; p=0.02) after NMES.
Discussion and conclusions – It appears 60 min of geko™ NMES reduces plantarflexor neuromuscular activity in the more challenging FICSIT-4 balance tasks. The clinical relevance of this alteration in lower-limb, neuromuscular recruitment strategy should be investigated further in clinical cohorts.

PP023
EFFECTIVENESS OF DIFFERENT PHYSIOTHERAPY PROGRAMS FOR ADOLESCENTS WITH LOW BACK PAIN

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Introduction. Wide spreading of low back pain in young people is a serious concern because the pain that occur in adolescence tends to recur in older age. Scientific literature lacks information about rehabilitation efficiency for adolescents suffering from low back pain.
Purpose. Tasks of work was to compare efficiency of different spinal stabilization programs on low back pain intensity, level of functional state, trunk muscles static endurance, static balance and hips extensor and flexor muscle flexibility.
Methods. The study was carried out in July 2013 to March 2014. Study included 60 (n=60) low back pain experiencing 11 - 17 aged adolescents. The subjects were divided into two groups: group I (n=30) carried out spinal stabilization program on the gym mat, group II (n=30) - with therapeutic balls. During the study, the patients were applied 10 physiotherapy procedures each, lasting 30 min. Visual Analog Pain Intensity (VAS-10) Scale, Modified Oswestry Questionnaire, Roland & Morris Disability Questionnaire, Modified McGill test, Flamingo balance test, Modified Thomas Test, passive Straight Leg Raise test were applied to assess the subjects.
Results. After the course of spinal stabilization programs low back pain reduced significantly: from 4.8 to 2.0 in group I, and from 4.1 to 1.2 in group II. Functional state improved significantly in both groups. Trunk muscles static endurance increased significantly. Physiotherapy with therapeutic balls significantly more improved back (57.9±24.7 -> 71.5±24.8 s), right (31.6±21.5 -> 44.3±21.8 s) and left side (30.3±20.0 -> 43.1±18.7 s) muscle groups' endurance, static balance, hips extensor and flexor muscle flexibility.
Conclusions. Both spinal stabilization programs reduced low back pain and improved functional state in adolescents. Physiotherapy program with therapeutic balls has advantages against physiotherapy on the gym mat.

PP024
ELECTRICAL NERVE STIMULATION FOR 20 MINUTES DOES NOT INDUCE NEUROMUSCULAR FATIGUE IN OLDER ADULTS, REGARDLESS OF LEG POSITION

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Introduction – The geko™ neuromuscular electrical stimulation (NMES) device innervates the common peroneal nerve, evoking the calf muscle-pump to promote lower-leg circulation. A potential neuromuscular fatigue effect has not been examined for different leg positions.
Purpose – The study aimed to monitor lower-leg neuromuscular activity during 20 min bouts of geko™ NMES in older adults, with the leg in three different positions.
Methods – Healthy, older adults (n=15; aged 59-83 yrs) underwent geko™ NMES for 20 min at either: 0°, 45° or 90° knee angle (random-order). Electromyography (EMG) recorded neuromuscular activity of the: tibialis anterior (TA), peroneus longus (PL), medial gastrocnemius (MG) and lateral gastrocnemius (LG). This was repeated separately for the other knee angles (total time=60 min). Discomfort was self-reported during NMES using a visual analogue scale (0=no pain, 10=severe pain). Raw EMG signals were processed (root mean square [RMS] and median frequency [MDF]) and normalised to participant maximal NMES twitch. For each knee angle, RMS, MDF and discomfort were analysed separately at: 1, 10 and 20 min using one-way Friedman's ANOVAs.
Results – The RMS activity of the TA ($p>0.4$), PL ($p>0.3$) and LG ($p>0.2$) did not change during electrostimulation in each leg position. The MG RMS activity decreased ($P=0.01$) after 10 min of electrostimulation at 90° knee angle (-5.2%; $p=0.006$). The MDF muscle activity was similar during 20 min NMES for each knee angle ($p>0.09$). No pain was reported during NMES (0°, 2.0±0.8; 45°, 1.9±0.6; 90°, 1.7±0.7; $p>0.05$).
Discussion and conclusions – Lower-leg neuromuscular activity during 20 min of geko™ electrostimulation remained consistent with the knee at 0° (full-extension) and 45° (partial-flexion). Medial gastrocnemius activity reduced during NMES at 90° flexion, but an unchanged EMG signal frequency (MDF) indicates a lack of fatigue.

PP025
INFLUENCE OF CORE STABILITY EXERCISE ON LUMBAR VERTEBRAL TRANSLATION AND ROTATION IN PATIENTS WITH LUMBAR SEGMENTAL INSTABILITY: A RANDOMIZED CLINICAL TRIAL

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Introduction: Excessive lumbar vertebrae translation and rotation in sagittal plane has been attributed as an associated factor of lumbar segmental instability (LSI).
Purpose: The aim of study was to investigate the effect of core stability exercise on the translation and rotation of lumbar vertebrae in sagittal plane in patients with LSI.
Methods: 30 patients aged 18-40 years old with LSI were included. The participants were randomly divided into two groups of treatment and control. The treatment group received general exercises plus core stability exercise for 8 weeks whereas; the control group received only general exercises. The magnitude of translation (mm) and rotation (deg) of lumbar vertebrae in the sagittal plane was determined by radiography in flexion and extension at baseline and after intervention. The primary outcome measures were to determine the mean changes from baseline in translation and rotation of the lumbar vertebrae after 8 weeks of intervention in each group. The secondary outcome was to compare the two groups in regard to translation and rotation of the lumbar vertebrae at the end of the study period. Data were analyzed using paired t-test and independent t-test.
Results: Compared with baseline values, mean value of translation and rotation of the lumbar vertebra reduced significantly in both groups ($P<0.05$). At the endpoint, mean translation value of L4 ($P=0.04$) and L5 ($P=0.001$) and rotation of the L5 ($P=0.01$) in the treatment group was significantly lower than the control group.
Discussion and conclusions: These findings indicate that in patients presented with lumbar segmental instability, core stability exercises plus general exercises are more efficient than general exercises alone in the control, reduction and improvement of excessive lumbar vertebrae translation and rotation.

PP026
EFFECTS OF BIOFEEDBACK REHABILITATION WITH THE USE OF A SIGNAL CANE AND A BALANCE TRAINER ON FUNCTIONAL EFFICIENCY AND GAIT BALANCE AFTER STROKE

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Introduction. Balance disorders in patients after stroke can be observed when the base of support is reduced while standing, but it can also manifest itself in a sitting position. Balance trainer and signal cane with biofeedback are devices, which can be used in stroke rehabilitation.
Purpose. Evaluation of the rehabilitation effects of balance and gait reeducation in people after stroke with the use of signal cane and balance trainer with biofeedback.
Methods. The study was conducted in a group of 75 patients after stroke. A control group (n=25) had conventional therapy, the test group 1 (n=25) had conventional therapy and balance trainer exercises and the test group 2 (n=25) had traditional therapy, balance trainer exercises and signal cane training. All the participants trained 45 min per day, 5 days per week for 2 weeks. The functional efficiency in ADL was tested by means of Barthel Index and FIM, gait speed with the speed test, the number of steps taken by paretic lower limb at a distance of 10 meters, an independent mobility in the test "up and go". The balance examination was performed on the posturography platform.
Results. The clinical improvement after rehabilitation in all patients has been observed. However, there were significant statistical differences in effects of rehabilitation between the groups. Significantly better efficiency of the test groups was observed in terms of ADL in FIM scale (p=0,0005***), Barthel Index (p=0,0222*) and the number of steps taken by paretic lower limb (p=0,0103*). Higher effects of rehabilitation in the test groups also concerned balance in Berg Balance Scale (p = 0.0216 *) and scope of the surface (with the eyes closed) (p = 0.0064 **) in the study group was obtained.
Conclusions. The use of signal canes and Balance Trainer with biofeedback in rehabilitation after stroke significantly improves balance and functional abilities. The biofeedback methods are more effective than conventional therapy in balance and gait rehabilitation after stroke.

PP027
THE EFFICACY OF GAIT TRAINING USING A BODY WEIGHT SUPPORT TREADMILL AND VISUAL BIOFEEDBACK IN EARLY REHABILITATION AFTER STROKE

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Introduction. One of the most important goals of stroke patients rehabilitation, is to regain the ability to walk and to improve the functional independence in everyday life. Gait training programs are often based on a treadmill training, body-weight support and biofeedback.
Purpose. The objective was to assess the early and long-term results of body weight supported treadmill training, with or without spatio-temporal biofeedback in early period of rehabilitation after stroke.
Methods. Thirty people at early period (<3 months) after stroke were randomly divided into two groups. The group (n=15), with a physiotherapy program based on body weight-supported treadmill training with visual (step lengths) biofeedback, and the group (n=15) with body weight-supported treadmill training but without biofeedback. Inclusion criteria: first ischemic stroke, independent gait, improvement period according to Brunnstrom 3 to 4, spasticity of lower limb according to Ashworth ≤1 plus, level of disability-3 in Rankin Scale. The program consisted of 15 sessions during 3 weeks. The outcome measures contain, spatio-temporal and kinematics gait parameters (gait speed, step lengths, time of gait phase, hip and knee range of motion). The assessment was conducted before, immediately after and 3 months after the training.
Results. Following program completion, in all patients in all parameters, statistically significant improvement was observed. ($p<0,05$). After 3 months, significant improvement in all parameters in the Study group was maintained. However, in the Control group the only progress in gait speed and rhythm was preserved. There were no significant differences between groups in other spatio-temporal parameters of gait nor additionally assessed parameters.
Conclusions. Gait training using a treadmill with body weight-support improves gait and functional efficiency of stroke patients. The study did not provide clear proof which would confirm the hypothesis that gait training after stroke, is more effective with use of visual spatio-temporal biofeedback in early period of rehabilitation.

PP028

ROBOTIC GLOVE WITH VIRTUAL REALITY BIOFEEDBACK IN SPASTICITY MANAGEMENT ON ACUTE AND CHRONIC PATIENTS WITH SPASTIC HAND PARESIS: IMPACT ON GOAL ORIENTED FUNCTIONAL THERAPY AND ROUTINE MASS THERAPY

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Introduction-Functional restraint of upper extremity is a frequent complication after Stroke, Spinal Cord Injury and Traumatic Brain Injury, with significant impact on quality of life and self-independence for tens of thousands of citizens per year in Czech Republic.
Purpose-Hand therapy needs more time and more focused therapy. Manual therapy is performed one to one; it usually provides the continuous presence of a therapist and it is time consuming. Patients need frequently hand therapy, so many therapy tasks can be performed by modern technologies, with higher treatment intensity and reliability.
Methods-Automated intervention was part of Specific Intensive Repetitive Utility Program. Patients inclusion criteria was ability of focusing at least 20 minutes on the screen, no Neglect syndrome, no fixed contracture. Protocol aims was to monitor and detect the effects of automated movement therapy on short-term and long term. Evaluation timing before the 1st and after the 15th application. Sessions duration: 30 minutes per session.
Results-Therapy was applied on 103 patients. Positive functional outcome was seen on 31 patients; for 72 patients therapy effect was seen on the level of ROM improvement. The best result was found on patients with least minimal active fingers movement or twitch, and fingers spasticity graded at maximum level 2 Modified Ashworth Scale.
Discussion-To achieve optimal therapeutic long-term results was important follow up with practical daily tasks after automated therapy. Short-term benefit from automated treatment is related pain alleviation, swelling reduction. No side effect was reported.
Conclusions-Gloreha glove therapy is feasible and can be applied in acute and chronic phase if there is no evidence of fixed contracture. Robotic glove doesn´t pose timing increase for therapist and it can be applicable in mass therapy in rehab clinics with limited therapists to maintain focus on hand therapy.

PP029
EFFECTS OF A SINGLE TDCS STIMULATION ON GAIT PERFORMANCE IN CHRONIC HEMIPLEGIC PATIENTS

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Introduction: transcortical direct current stimulation (tDCS) can be efficient to improve motor recovery in hemiplegic patients after stroke. Proofs of concepts are still needed regarding its potential use for gait recovery.
Purpose: to evaluate the effect of a single session of stimulation of the primary motor cortex (M1) with tDCS versus placebo (Sham) on the walking performance of hemiplegic patients at a chronic stage.
Methods: randomize, cross over and double-blind study. 18 chronic stroke patients (6 females, 12 men, average age 60 years) were included, with an initially complete hemiplegia. The post-stroke delay varied from 14 months to 11years. Subjects participated to two randomly ordered sessions of stimulation: a session of anodale stimulation (2 mA, 20 min) of the lower limb ipsilesional M1 (STIM condition) and a sham session (20 min; SHAM condition). The primary endpoint was the six minute walking test (6MWT), the secondary end point was the Wade test. These tests were performed 2 days before, during, after one hour, and 10 days after each session.
Results: comparisons were based on the linearly corrected data of each patient. The comparison between the 6MWT under STIM versus SHAM conditions demonstrated a significant positive effect of the stimulation by 11% during stimulation (Wilcoxon matched pairs $p = 0.019$) and 6% 1 hour after stimulation (Wilcoxon matched pairs $p = 0.025$). There is no significant difference regarding the Wade test.
Discussion and conclusions: these results support a positive effect of a single session of anodal tDCS of the M1 ipsilesional area of the lower limb in chronic hemiplegic patients. This improvement is significant regarding the 6MWT.

PP030
REHABILITATION OF THE PELVIC FLOUR MUSCLES: PATIENTS' COMPLIANCE

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Introduction: The rehabilitation of the pelvic floor (PF) muscles is a procedure that requires good cooperation between the patients and the rehabilitation team.
Purpose: The study of the association of patients' compliance in a PF rehabilitation program according to their subjective and objective improvement.
Methods: Eight women participated with average age 50.75 and two men 72 years old. The two men had undertaken prostatectomy, 3 women suffered from multiple scleroses, and the rest 5 from stress incontinence (SI). Detailed medical history and physical examination were performed. Questionnaires for voiding disorders (women with SI answered: ICIQ-FLUTSLF & ICIQ-FLUTSsex), bladder and exercise diaries and 24h pad test were used. Therapeutic protocol with: personalized, exercises of the PF muscles with EMG biofeedback, program duration: 10 sessions in 3 months and monthly follow-up up to 6 months.
Results: Seven patients had moderate to good compliance, and they performed at least the 15 out of the 21 weekly sets of 5min exercises that were asked to do. The rest performed less than 15 weekly sets of exercises and considered to have bad compliance.Five patients who mentioned subjective improvement, and was confirmed by their bladder diaries and pad tests, had shown moderate to good compliance. Improvement was reported after the 4thsession (one month of exercising).Two patients with prostatectomy had good compliance and subjective improvement but it was not objectively confirmed.
Discussion and conclusions: Our findings are in agreement with international literature. Conservative management of urinary incontinence with PF muscles exercises and bladder training is a first-line therapy but therapeutic results are delayed by several weeks. Patients' compliance constitutes an important success factor of the program. The subjective improvement of symptoms accompanied by objective criteria is associated with the dedication in treatment programs.

PP031
IS ISOKINETIC EXERCISE DANGEROUS FOR THE HEART?

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Introduction: Very strenuous exercises can be performed on an isokinetic dynamometer in order to evaluate the resistance to fatigue of different muscular groups. Good cardiac function is necessary in order to perform these very intensive exercises; otherwise an acute myocardial dysfunction could theoretically appear in predisposed patients.
Purpose: Our study aimed to observe the cardiovascular impact (by biological point of view) of maximal intense isokinetic eccentric and concentric protocols performed by a population of sedentary young men.
Methods: Resting (T0) and post-exercise (just after (T1), 3 hours (T2) and 24 hours after the exercise (T3)) blood samples were taken in 2 populations of young sedentary men: 12 subjects (22.5±1.15 yo) for the eccentric protocol and 18 subjects (22.4±2.6 yo) for the concentric protocol. These subjects performed an intense maximal isokinetic exercise of the quadriceps muscles involving 30 knee flexions–extensions for each leg. We evaluated markers of cardiovascular risk (highly sensitive troponin T (hs-TnT), N-Terminal Brain natriuretic peptide (NT-proBNP), myoglobin (MYO)), of inflammation (highly sensitive C-reactive protein (hsCRP)), muscle damage (creatine kinase (CK)) and of oxidative stress (myeloperoxidase (MPO), lipidic peroxides (POXL), reduced (GSH) and oxidised glutathione (GSSG)). Haemodynamic parameters were measured continuously using a Portapres, and respiratory parameters were measured using a Sensormedics Vmax 29C.
Results: All the physiological parameters measured presented statistically significant changes. For the eccentric exercise, no significant modification in cardiac (NT-proBNP, hs-TNT) and inflammation (hsCRP) biomarkers was observed. However, a significant increase for CK (T3), MYO (T2), MPO (T1), POXL (T1), GSSG (T3) and ratio GSH/GSSG (T2-T3) was shown. For the concentric exercise, the results showed significant increases for the CK (T1-T2-T3), MYO (T1-T2), GSH/GSSG (T1). Evolutionary trends were also observed for the following biomarkers: NT-proBNP (T1-T2-T3), MPO (T2), and GSSG (T4).
Discussion and conclusions: No modification in cardiac biomarkers was observed after the maximal eccentric isokinetic exercise but some variations can be observed for these biomarkers after the concentric exercise. However, these changes do not exceed the reference values in healthy subjects. We were thus able to prove that the exercise could be performed without any risk to cardiac function in young sedentary subjects. Nevertheless, a significant level of oxidative stress was induced by both exercises.

PP032
A REPEATED EDUCATIONAL INTERVENTION ON HYGIENE POSTURAL AND RESPIRATORY IN CHILDREN WITH NEUROLOGICAL DISORDERS TO IMPROVE THEIR QUALITY OF LIFE

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Introduction: Children with severe neurological disorders (SND) have a severe motor impairment. The combination of immobility, weakness and skeletal deformity can lead to significant prevalence of respiratory illness. In fact, respiratory infections are the main causes of hospitalizations, morbidity and mortality in people with SND. Research has shown a significant relationship between posture and pulmonary function. Purpose: Evaluate the effectiveness of an educational intervention on hygiene postural and respiratory for the parents of children with SND aimed to optimize respiratory status.
Methods: Clinical trial of eleven patients, between 0 and 24 months with SND and respiratory complications. An educational intervention on hygiene postural and respiratory for the parents of these children was done through workshops. Parents practiced with their children in their homes the techniques learned every day. The number of exacerbations for was registered the 6 months prior to the study and for 6 months of this. Quality of life questionnaires were registered at the start and end of the study.
Results: The number of visits to the doctor decreased significantly ($p < 0.05$) the number of admissions decreased by 10% and emergency room visits by 30%. All children improved the score of the test of quality of life "Pediatric Quality of Life Inventory ™" (PedsQL ™) at an average of 100 points in the Physical Health Summary section.
Discussion: Muscles of respiration are also muscles of postural support, and vice versa. This duality of function means that respiration and postural control can never be treated as isolated responses. By teaching the patient ventilatory strategies and the importance of positioning to improve pulmonary function, will stimulate the optimal chest and trunk development.
Conclusions: Educational intervention on postural and respiratory hygiene for parents of children with SND is effective to make a good management of respiratory problems, improving their quality of life.

PP033
BEST FACILITATED CORTICAL ACTIVATION DURING DIFFERENT STEPPING, TREADMILL, AND ROBOT-ASSISTED WALKING TRINING PARADIGMS AND SPEEDS: A FUNCTIONAL NEAR-INFRARED SPECTROSCOPY NEUROIMAGING STUDY

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Introduction: Robot-assisted and treadmill-gait training are promising neurorehabilitation techniques, with advantages over conventional gait training, but the neural substrates underpinning locomotor control remain unknown particularly during different gait training modes and speeds.
Purpose: The present optical imaging study compared cortical activities during conventional stepping walking (SW), treadmill walking (TW), and robot-assisted walking (RW) at different speeds.
Methods: Fourteen healthy subjects (8 men and 6 women, mean age 30.06 years ± 4.53) completed three walking training modes (SW, TW, and RW) at various speeds (self-selected, 1.5, 2.0, 2.5, and 3.0 km/h). A 31-channel functional near-infrared spectroscopy (NIRS) system (LABNIRS, Shimadzu corp., Kyoto, Japan) determined cerebral hemodynamic and oxy-hemoglobin changes associated with cortical locomotor network areas in the primary sensorimotor cortex (SMC), premotor cortex (PMC), supplementary motor area (SMA), prefrontal cortex (PFC), and sensory association cortex (SAC) at a frequency of 6 Hz. We calculated the map of cortical activities with the level of significance at a p-value of 0.001 using NIRS-statistical parametric mapping (NIRS-SPM, http://bisp.kaist.ac.kr/NIRS-SPM).
Results: There was increased cortical activation in the SMC, PMC, and SMA during different walking training modes. More global locomotor network activation was observed during RW than TW or SW. As walking speed increased, multiple locomotor network activations were observed, and increased activation power spectrum.
Discussion and conclusions: This is the first empirical evidence highlighting the neural substrates mediating dynamic locomotion for different gait training modes and speeds. Fast, robot-assisted gait training best facilitated cortical activation associated with locomotor control. Further investigations are required to probe neuroplastic changes and associated locomotor recovery and functional ambulation following long-term robot-assisted gait training with different training modes and speeds in individuals with neurological locomotor impairments.
Acknowledgments: This study was supported by the Department of Translational Research Center for Rehabilitation Robots, National Rehabilitation Center (grant no. NRCTR-IN14001).

PP034
THE EFFECT OF MASSAGE ON WEIGHT GAIN IN VERY LOW BIRTH WEIGHT NEONATES

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Introduction: Achieving optimal weight is one of the factors that take into consideration in discharge of preterm infants from hospital.
Purpose: The aim of this study was to assess the effect of massage on weight gain in very low birth weight neonates.
Methods: This study is a nonrandomized blocking clinical trial in NICU. 40 neonates who had inclusion criteria, were divided in two groups of case (n=20) and control (n=20). Both groups received standard care of preterm neonates. Additionally, case group received the massage three times daily for 15min for each time at 7 days. During the study, the weight of neonates was measured every day at 12 am. Data were analyzed by $SPSS_{19.}$
Results: Average weight of neonates between two groups had no statistically significant difference until 4th day of study. However, this difference became statistically significant after 4th day, while the average weight gain was higher in the case group (p=0.04, 0.02, 0.01 respectively). The mean duration of hospital stay in massage group (34.1days ± 7.5) was less than control group (41.7days ± 9.1) (p=0.007).
Discussion and conclusions: The massage can promote weight gain in very low birth weight neonates and also led to earlier discharge. This is recommended as an effective method to increase weight gain in very low birth weight neonates.

PP035
EFFECTS OF PROGRESSIVE RESISTIVE EXERCISES IN PATIENTS WITH SUBACROMIAL IMPINGEMENT SYNDROME

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Introduction: Effects of progressive resistive exercises (PRE) for reduction of pain and improvement of shoulder function in subacromial impingement syndrome and its comparison with resistive exercises.
Purpose**:** To evaluate the effects of PRE on pain, shoulder range of motion, strength and function.
Methods: In this randomized control trial, 40 patients were divided randomly into group 1 (20 subjects) and group 2 (20 subjects). Group 1 received TENS (30 min), ultrasound (10 min), hot pack (30 min), CEFAR (atrophic electrical stimulation program) (15 min), shoulder mill exercises, shoulder pulley exercises, wand exercises, codman exercises, stretch exercises, Group 2 received; TENS (30 min), ultrasound (10 min), hot pack (30 min), CEFAR (atrophic electrical stimulation program) (15 min), shoulder mill exercises, shoulder pulley exercises, wand exercises, codman exercises, stretch exercises and progressive resistive exercises, for 15 sessions (5 days a week for 3 weeks). Patients were evaluated with a form according to their pain, joint movement range, muscle strength and functional assessment. Pain was scored with VAS, joint movement range was assessed with goniometer, muscle strength was evaluated manually and DASH survey was used for functional assessment.
Results: Significant differences were found in both group's VAS value average and moving averages, range of motion, functional DASH questionnaire before and after treatment while resting and moving ($p<0.001$). However there was no significant differences between two groups ($p>0.05$). Group 1's average percentage DASH scores, VAS-movement score, changes in muscle flexion percentages before and after therapy was significantly lower than the group 2.
Discussion and conclusions: This study showed that both group has favorable effect on pain, joint movement range and function. Giving the fact that the average changing percentage of DASH score, VAS-movement score, was found to be lower in group 2 than those in group 1, it is thought that clinically, progressive resistive exercises are more beneficial in functional recovery.

PP036
THE EARLY STAGE EFFECT OF HIP ABDUCTORS STRENGTHENING ON KNEE OSTEOARTHRITIS

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Introduction: Osteoarthritis is a common cause of knee pain in elderly people. It can severely interfere with patients' daily activity and work performance, and it may eventually lead to a handicap and disability of the lower extremity.
Purpose: To determine if patients with knee osteoarthritis (KOA) who perform hip abductors strengthening demonstrate greater improvements than females who perform quadriceps strengthening.
Methods: Forty-two old females with KOA either initial hip abductors strengthening group (hip group) or initial quadriceps strengthening group (quad group) for 2 weeks. Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) pain, stiffness, and physical function score were measured. Isokinetic strength peak torque (PT) was assessed for knee extensors and flexors.
Results: From baseline to 2 weeks, the hip group demonstrated improvement in WOMAC pain (135.36±74.99 vs. 46.45±41.05, P=0.042), stiffness (57.06±54.82 vs. 19.93±30.24, P=0.042), physical function score (368.74±311.31 vs. 172.12±215.14, P=0.042), knee extensor PT (42.21±19.64 vs. 73.70±29.88, P=0.000) and flexor PT (20.78±11.86 vs. 36.32±14.89, P=0.000) , while knee flexor PT (20.81±12.82 vs. 30.24±9.93, P=0.001) were increased in the quad group. After 2 weeks, there were less mean ± SD pain (46.45±41.05 vs. 103.05±113.78, P=0.042), stiffness (19.93±30.24 vs. 45.79±48.06, P=0.045) and physical function score (172.12±215.14 vs. 425.71±381.91, P=0.012) in the hip group than in the quad group. Knee extensor PT was higher in the hip group than in the quad group (73.70±29.88 vs. 37.77±13.39, P=0.000).
Discussion and conclusions: Hip abductors strengthening are good choice for knee osteoarthritis in the exercise early stage, which could avoid the pain increasing of quadriceps strengthening and improve compliance. Supported by the major project of Shanghai health system (No. 2013ZYJB0501) and Shanghai Integrated Chinese and Western Medicine Talent project (No. ZY3-RCPY-4-2005)

PP037
THE EFFECTIVENESS OF WHIRLPOOL FOR PATIENTS WITH NEUROPATHIC PAIN DUE TO KNEE OSTEOARTHRITIS

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Introduction: Whirlpool has been widely used in various musculoskeletal conditions.
Purpose: To determine the efficacy of warm whirlpool for patients with neuropathic pain due to knee osteoarthritis (OA).
Methods: This is a randomized,placebo controlled study.Thirty five patients with neuropathic pain due to knee OA were randomized into either intervention or placebo groups.Group 1 (n=20) were treated with whirlpool and group 2 (n=15) were treated with placebo for 20 minutes during 15 sessions.Patients were evaluated according to pain,knee range of motions (ROM),quality of life (QoL) and sleep quality.Pain severity was assessed using a visual analogue scale (VAS) and the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC).WOMAC disability and functional scores for functional ability, Short Form-36 Health Survey (SF-36) for QoL,Pittsburgh Sleep Quality Index (PSQI) for sleep,DN4 for neuropathic pain were used for assessments.Patients were evaluated at baseline and the end of the 15 day intervention.
Results: At the end of the therapy, there were statistically significant improvements in VAS, knee ROM,DN4 scores,WOMAC scores and PSQI for both groups ($p<0.05$).There were a statistically significant for SF-36 scores ($p<0.05$) except for general health score in group 1 ($p>0.05$) and physical function and general health score in group 2 ($p>0.05$). Also there were a statistically significant difference between the groups for VAS, WOMAC functional score and SF-36 role limitation, pain, vitality, social function and mental health scores ($p<0.05$).
Discussion: Whirlpool provided significant improvements in pain, range of motion and disability when it was used as placebo or intervention.
Conclusions: Whirlpool can be used as an additional therapy method in the treatment of patients with neuropathic pain due to knee OA.

PP038
EFFECT OF ELECTRICAL STIMULATION ON NEURAL REGENERATION IN SPINAL CORD INJURED RAT

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Objective To investigate the effect of electrical stimulation on injured spinal cord could influence the neural regeneration.
Methods A total of 20 Sprague-Dawley female rats weighing 250~300 g were divided into 3 groups: control (CON, n=5), spinal cord injury only (SCI, n=5) and spinal cord injury with electrical stimulation (SCI+ES, n=10) group. A complete spinal cord transection was performed at the 10th thoracic vertebra level. The electrode was implanted into injured spinal cord region and electrical stimulation was applied 4 hours for seven days. The behavioral tests using a Basso Beattie Bresnahan (BBB) locomotor scales and Touch test sensory evaluator (TTSE) were conducted at the 2nd and 7th day. Somatosensory evoked potential (SEP) by tibial nerve stimulation were recorded at the 2nd and 7th day. Western blot assays were performed to determine the quantity of PGP 9.5, ROKá, RhoA, ERK, pERK, NFkB and p38.
Results There are no significant differences in BBB locomotor scales and TTSE between SCI group and SCI+ES group ($p>0.05$). N1 and P2 latencies at the 2nd day were showed significant difference between SCI group and SCI+ES group ($p<0.05$). P1-N1 and N1-P2 amplitudes at the 7th days were showed significant difference between SCI group and SCI+ES group ($p<0.05$). In western blot study, there was significant decrease in the density of RhoA and was significant increase in the density of PGP 9.5, ROKá, ERK, pERK, NFkB and p38 in the SCI+ES group.
Conclusion These results suggest that the electrical stimulation at the injured spinal cord region can improves electrophysiological and can influence the neural regeneration.

PP039
THE EFFECTS OF MANUAL THERAPY ON HAND SYMPTOMES AND MEDIAN NERVE TENSION IN PATIENTS WITH CARPAL TUNNEL SYNDROME

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Introduction: nerve mobilization is a relatively new approach in manual therapy that its mechanism, efficacy, and the most effective method for using in treatment of nervous system involvement are not clear.
Purpose: The aim of this study was to investigate the effectiveness of manual therapy on severity of hand symptoms and median nerve tension in patient with carpal tunnel syndrome (CTS).
Methods: In this randomized clinical trial study, 32 patients with CTS were assigned into two groups; treatment and control group. In both groups, the patients received the routine physiotherapy including the rest splint, TENS, and therapeutic ultrasound for 4 weeks. In addition to the routine physiotherapy, the patients in the treatment group received the manual therapy for both nerve mobilization and mechanical interface structures. The severity of hand symptoms (pain and tingling), using of visual analogue scale, and median nerve tension, using of median neurodynamic test, were assessed at the baseline and after 4 weeks. Paired and independent t test were used to comparison of data within and between the two groups respectively. The significance level was considered $p<0.025$
Results: There was a significant improvement in severity of hand symptoms and median nerve tension in both groups at the end of study period compared to baseline values ($p<0.025$). The median nerve tension and severity of hand symptoms in the treatment group were significantly decreased ($P<0.025$) relative to the control group.
Discussion and conclusions: Using of manual therapy for nerve mobilization and mechanical interface structures, in accompany to physiotherapy modalities, leads to more improvement in hand sensory discomfort and median nerve tension in patients with carpal tunnel syndromes.

PP040
THE PREVENTION OF NEUROLOGIC LESION AFTER A THORACIC SPINAL FRACTURE, ABOUT A CLINICAL CASE

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Introduction: The unique anatomy of the thoracolumbar junction predisposes this level of the spinal column to dislocation fractures as the thoracic spine loses its structural rigidity. Fracture dislocations are associated with the highest incidence of neurologic injury and the primary goals of treatment include protection of the neural elements, prevention of deformity and instability.
Purpose: The purpose of this presentation was to alert for the neurological consequences of an unstable fractures and to highlight the importance of using a rigid thoracolumbosacral orthosis (TLSO) in prevention.
Methods: The case describes a female patient of 61 years old with osteoporosis and depression under pharmacological support. After an accidental fall the patient had an unstable fracture of D12 with retrolisthesis grade II L5-S1, without neurological compromise. Medical treatment was proposed for pain. Not been prescribed any orthosis.Complementary examens were asked. After 6 weeks the patient reported severe increase in spine pain, paresthesias in lower limbs and perineum during a movement with trunk flexion. Neurologic deterioration was observed with impairment in motor and sensor function, bladder and bowel control. The patient was referred to surgical procedure.
Results: The patient was classified by the American Spinal Injury Association (ASIA) Impairment Scale (AIS) as ASIA D. Hospitalization lasted 21 days. After this period the patient was admitted to a rehabilitation center.
Discussion and conclusions: Fractures are the most feared osteoporosis complications and often result in disability. If surgery has not been recommended the use of a rigid TLSO provides immobilization, alignment and controls pain and is essencial in the prevention of neurological deficits in unstable thoracolumbar spine fractures.

PP041
KNEE OSTEOARTHRITIS IN PATIENTS WITH LYMPHOEDEMA – REHABILITATION OPPORTUNITIES

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Introduction: Lymphoedema may cause significant physical and psychosocial problem. One of the most important comorbidity is the knee arthrosis which has an additional negative impact on quality of life of patients with lymphoedema. The aim of this study was to investigate rehabilitation needs and therapeutic oppurtinities of patients with lymphoedema who suffer from knee arthrosis at the same time.
Methods: Medical documentations of treated patients with lymphoedema between 01.09.2013-31.08.2015. were examined retrospectively on our 40 beds rehabilitation department.
Results: In the last 2 years 308 patients with lymphoedema were treated and 134 of them had knee osteoarthritis (43,5 %) at the same time.This ratio is much higher than for the total population (woman: 15%, man: 10 %). A number of risk factors are common (obesity, age, gender, immobility, trauma etc.), but it was suggested that may be a association between the alteration of lymphatic vessels and osteoarthritis (1). In the rehabilitation program most important elements are physiotherapy (mainly individual gymnastic), education and food therapy. Beside oral medication local injection treatment takes a back seat due to an increased risk of infection. The electro- and physiotherapy used in many forms (TENS, ultrasound, interference, magnetic therapy, wraps etc). It's advisable to avoid direct current, because it often causes skin damage. Because patients outsize mostly custom-made braces and orthopedic shoes comes into play.
Conclusions: During the rehabilitation program of patients with lymphoedema and knee osteoarthritis there are fewer opportunities and well we should consider which one to apply.
Reference
1. Jixiang Shi, Qianqian Liang, *et al.* Distribution and alteration of lymphatic vessels in knee joints of normal and osteoarthritic mice. Arthritis Rheumatol. 2014 March; 66(3): 657-66.

PP042
JOINT HEALTH, FUNCTIONAL ABILITY AND PHYSICAL ACTIVITY IN ADULT PATIENTS WITH HEMOPHILIA

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Introduction: Joint health, functional ability and physical activity are the main determinants of daily life in people with haemophilia (PWH) and they are related to complications and ageing. It is important to consider the following metrics due to the better guidelines for the management of haemophilia and in order to determine the current principles of treatment for PWH.
Purpose: To evaluate joints health, functional ability and physical activity of PWH.
Methods: 24 adults with severe or moderate haemophilia (H) (mean 31.79±10.43 years) and 29 control (C) man (mean 29.82±9.69 years) volunteered for the study. Subjects performed isokinetic knee flexion and extension test at two angular velocities (Biodex System III dynamometer). Subjects activity level was assessed with the short form of International physical activity questionnaire (IPAQ), functional walking ability with a Six-Minute Walk Test (6MWT). All H subjects joints were evaluated using the Haemophilia Joint Health Score (HJHS version 2.1).
Results: C were consistently stronger than H in all dynamic strength measures ($p<0.001$). Functional ability and activity level were also higher in C compared with H ($p<0.001$). Age displayed significantly weak correlation with the HJHS ($r=0.016$, $p<0.05$) and strong correlation with 6MWT ($r=0.960$, $p<0.05$) scores. Physical activity, functional ability of H was significantly related with good functional state of joints ($p<0.05$).
Discussion and conclusions: Adults with hemophilia are characterized by lower muscle strength, activity level and functional ability compared with age-matched controls. Impaired functional ability and lower activity level are connected with lower extremities damage. Increasing of leg's functional capabilities, leads to improvement of participation in leisure activities and sport. The result of this study verify the influence of joint damage and strength on functional ability physical activity.

PP043
THE BENEFITS OF RECOVERY TREATMENT IN REFLEX SYMPATHIC DYSTROPHY SYNDROME

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Introduction. The etiology of reflex sympathic dystrophy syndrome is manifold. So remember trauma, poliomyelitis, polymyalgia rheumatica, carpal tunnel syndrome, prolonged immobilization, prolonged bed rest, stroke, ALS, cardiovascular disease, surgery. In 25% of cases is unknown etiology. Clinically diagnosed in 4 of the 5 signs: pain, swelling, skin color changes in temperature and local decreased range of motion.
Materials and methods. We studied a group included 11 patients with the following configuration: 2 patients with upper limb AND post stroke, representing 18.18% of all patients included in the study, five patients with upper limb post AND fracture humerus- humeral head and cervical surgery (45.45%), 2 patients with AND knees, tibial plateau fracture job (18.18%) and 2 patients (18.18%) with post knee sprain AND knees. We evaluated the lot in terms of pain using VAS function by conducting range of motion.
Results. In the study, we found increased incidence of male patients, 64% diagnosed with AND. 27% of patients included in the study come from rural areas. The highest incidence is seen in the humerus after fracture of the humerus, the incidence of other causes (stroke, knee sprain, fracture of the tibial plateau) is similar. At the first determining the values were between 4 and 7 on the VAS scale, averaging 5.27, ten days of treatment average value reached 2.72, and after three months average value reached 2.45. A mobility legally, passive flexion of the shoulder improves active and passive parallel, averages of 38^0 , 112 , 99^0 respectively. Active and passive shoulder extension increases from 16.5^0 to 21^0 , 23.5^0 ; abduction increases from 55^0 at 74.5^0 or 84.5^0. We note about knee improves mobility similar flexion increased from 45^0 at 94 and 112^0 .

PP044
CYTOKINES AND PHYSICAL EXERCISE IN HEMODIALYSIS PATIENTS – PRELIMINARY REPORT

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Introduction: The association between cytokines and physical exercises in hemodialysis patients is relatively little-known. Reverse epidemiology is observed in end-stage renal disease (ESRD) patients.
Purpose: The aim of this study was to evaluate serum cytokines concentration and inflammatory markers in hemodialysis patients before and after a four-week mobility rehabilitation program.
Methods: This was a prospective study including 18 patients (13 women and 5 men) on hemodialysis. The mean age of the studied group was 55±14 years (within the range of 24–74 years).
The mean time on hemodialysis was 65±64 months (6–269 months). The patients were dialysed three times a week for 4–4.5 hours.
The patients aged > 18 years were included after signing the informed consent. The enrolment criteria included ability of a patient to perform a minimal physical activity. The patients with heart failure of NYHA class IV or with advanced disorders of the motor system were excluded, as well as the patients with systemic and malignant diseases. The patients spent 4 weeks in the Rehabilitation Department. The following biochemical tests were performed before and after the exercise program: cystatin C, hs-CRP (high-sensitivity C-reactive protein), homocysteine, leptin, IL-6 (interleukin-6), TNF-á (tumor necrosis factor), adiponectin, resistin, TGF-â1 (transforming growth factor beta 1), PAI-1 (plasminogen activator inhibitor type 1). This project was supported by National Science Centre, Poland (NN 404273740).
Results: Cystatin C, TNF-á, PAI-1 levels were reduced and hs-CRP, homocysteine, leptin, IL-6, adiponectin, resistin, TGF-â1, PAI-1 levels were increased after the program.
No significant changes in biochemical tests results have been found. Only increase of serum resistin concentration was significant (p=0.0467).
Discussion and conclusions: The greatest difference was seen in the concentration of cystatin C but the change was not significant. Increase of serum resistin concentration was significant. Additional research is needed to confirm these effects.

PP045
DETERMINING WHETHER A FUNCTION-BASED HOME EXERCISE PROGRAM WITH CONSULTS CAN REDUCE FALL RISK IN ELDERLY PATIENTS

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Introduction: Strong evidence supports the use of exercises to prevent falls in the elderly. Shubert has elaborated an evidence based exercise prescription for fall prevention.
Purpose: The goal of this pilot study is to compare Schubert's recommendations with our current practice. The hypotheses were the proposed program decreases patient's fall risk, is more effective than current practice, and consults after discharge improve compliance.
Methods: 35 community dwellers, ≥65 years-old, ≥1 neurological condition, and ≥1 risk of falls (FTSTS>15sec, TUG>14sec, BERG<45, ABC<67%, fall≥1 in past 12 months), were recruited from outpatient PT department, and randomly assigned into a control (CG, n=22) or experimental group (EG, n=13). Both groups received PT, 2x/week, 10-32 visits. CG received standard practice. EG received a moderate-high intensity exercise program (designed using the mini-best), used a diary to emphasize exercise volume (50 hours in 6 months) and received 4 consults post discharge. TUG, FTSTS, BERG, ABC, and minutes of exercise/week were assessed at evaluation, 2, 4, and 6 months.
Results: The baseline analysis showed that groups were similar. A random effect model analysis adjusting for baseline scores and number of risk factors showed that groups made significant improvements in reducing fall risk over the 6M. EG improvements were significantly greater than CG over time. EG was associated with a faster increase in ABC (Estimate (E)=1.96, p=0.03), BERG (E=0.91, p=0.007) and faster decrease in TUG (E=-0.48, p=0.01). EG exceeded the target exercise volume, exercising significantly more than CG (2M=62.42 min more; 4M=93.34 min more and 6M=61.23 min more).
Discussion and conclusions: This study supports our 3 hypotheses. EG increased compliance with exercise may be attributed to consults and emphasis on dosage. This pilot study provides some preliminary evidence to support Shubert's recommendations.

PP046
QUALITY OF LIFE THREE MONTHS AFTER OPERATIVE TREATMENT OF THE FRACTURE OF FEMORAL NECK IN ELDERLY

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Purpose: To evaluate the quality of life and functional status three months after operative treatment of femoral neck fracture in elderly patients and to find out correlation between functional status and quality of life.
Methods: In a prospective study we included elderly patients with femoral neck fracture who were admitted and operated in the Department of Traumatology of the University Medical Centre Ljubljana in the period of six months. The patients were reviewed at admission and three months after surgery. Functional status was evaluated with Functional Independence Measure (FIM) and quality of life with Nottingham Health Profile (NHP).
Results: Sixty-six patients aged 64 years or more with femoral neck fracture were included, average age was 81.4 years (range 65 -95), 52 (78.8%) participants were women and 14 (21.2%) men. 55 (83.3%) were independent before the fracture, 10 (15.2%) were partly independent and 1 (1.5%) was dependent in activity of daily living. They were all able to walk before the fracture, 38 (58%) without walking aid. Average FIM before the fracture was 114 (range 47- 126), after three months the average FIM was 83 (range 19-122). The average score in category energy level of NHP was 58.85, in category pain 32.87, in category physical activity 63.75, in category sleep 36.80, in category emotional reaction 20.56 and in category social isolation 16.63. The patients with better functional status evaluate their quality of life better ($p<0.001$).
Conclusions: Functional status is important in assessment of quality of life.

PP047
THE EFFECTS OF AGE AND GENDER ON FUNCTIONAL ABILITY OF HEALTHY WOMEN AND MEN

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Introduction: Functional ability is a key factor for the elderly populations both for the maintenance of independence and participation in family and community activities. Chronic diseases and aging can affect the balance ability of older people. Therefore, a critical assessment of balance ability is valuable for the detection and prevention of those at risk of falls, reduction in independent living among elderly people.
Purpose: The aim of this study was to determine the effect of gender and aging on functional ability and assess the incidence of reduction in functional ability of the elderly.
Methods: A cross-sectional study was performed on two hundred and two subjects separated into two gender groups (20 females, 20 males). Each group was categorized into six age groups between 21 and 80 years. Functional ability was measured with the timed up and go (TUG), functional reach (FR) and single leg stance (SLS) tests.
Results: The functional ability tests showed a significant decrease in the fourth decade in healthy women ($P<0.0001$). The results of the male groups indicate that none of the functional tests showed significant changes until the fifth decade but functional ability decreased significantly thereafter ($P<0.0001$). There was a significant correlation between the research variables and age ($P<0.0001$).
Discussion and conclusions: Functional ability declined significantly with age and this decline was identified earlier in women than in men. So it is important to find a good solution to reduce and delay the loss of functional ability, especially in women.

PP048
THE THERAPEUTIC VALUE OF ROMANIAN MINERAL WATERS IN KIDNEY DISEASES

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Hydromineral therapy is recommended in digestive diseases, chronic liver and metabolic diseases, kidney diseases. Drinking therapy is a major element of diuretic hydromineral therapy and consists of the ingestion of mineral water in the mineral water pump room of the specific establishment. Kidney stones represent an important problem of contemporary pathology. They have a high incidence among the active population, with many recurrences, complications and a long duration of temporary work incapacity. Administered internally, mineral waters first influence the functions of the digestive tract and after absorption, they influence water electrolyte metabolism and the urinary system by acting on the renal parenchyma, urinary tract, urine composition. Mineral water therapy in kidney diseases can be indicated both for prophylactic purposes in persons with conditions favoring the development of urinary tract stones or infections, in persons with a history of 1-2 renal colics or urinary tract infections, and for therapeutic purposes in patients with kidney or urethral stones with a permeable urinary tract, chronic urinary tract infections, chronic glomerulonephritis, gout, hyperuricemia. The dose should be adapted to the urinary excretion possibilities, in order to obtain the best diuretic efficacy, compatible with the urinary absorption, circulation and secretion conditions. Unlike drug therapy, which is sometimes accompanied by side effects, crenotherapy, if administered correctly, only very rarely causes side effects. Mineral waters administered internally are not active in single doses; their effect becomes apparent after 20-30 days of administration. In Romania, there are 15 balneary resorts for the treatment of kidney diseases. The natural therapeutic factors used for internal spa treatment in kidney diseases are: hypotonic oligomineral waters, hypotonic sulfur, calcium, magnesium, chloride oligomineral waters, hypotonic carbonated mineral waters, hypotonic alkaline mineral waters, and sedative bioclimate. The recommended spa resorts are: Olăneşti, Călimăneşti-Căciulata, Slănic Moldova, Băile Tuşnad, Sângeorz Băi, Vatra Dornei, Herculane, Borsec.

PP049
HYPERHIDROSIS REHABILITATION: IS IT POSSIBLE?

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Primary focal hyperhidrosis (HH) is a disorder of idiopathic excessive sweating that typically affects face, axillae, palms, groins and surface of the feet. Although under-diagnosed is a prevalent disease in our society, with high impact on the quality of personal life and the participation of the patient in his social and professional environment. Conservative (topic aluminum salts, tap-water iontophoresis, anticholinergic drugs) or permanent (sympathectomy) treatment has numerous risks and undesirable effects such as xerosis or post-surgical neurotmesis. Treatment with abobotulinium toxin-A (BTX-A) is an mild solution in this therapeutic duality. Our goal was to demonstrate the evidence of clinical viability of using the BTX-A in treating hyperhidrosis. We use PubMed platform, basing our search in the MESH terms hyperhidrosis AND treatment, obtaining 3046 articles. Although the use of BTX-A only be approved to treat axillary hyperhidrosis, there are studies demonstrating their effectiveness and safety in the treatment of other body regions. In palmar HH the efficacy measured both quantitatively and subjectively, was around 80-90%, with less durantion than axilary HH treatment. Uncontrolled studies have found that BTX-A treatment of plantar HH may be 50% less effective as for palmar, riquiring more dosages to yielding aproximatly 6 months of symptoms relief and improved quality of life. BTX-A has been sucessful in the treatment of frontal or forehead and groins HH, effecting a reduction in sweating of aproximately 75% that is mantained for at least 5 month. Other pathology that the BTX-A has been widely used and with some degree of evidence in the results was in hyperhidrosis of amputees. Adverse effects include pain and hematomas are commun in plantar and palmar regions. The percutaneous administration techniques of botulinum toxin should be taken as should be regarded as a potential option for the hyperhidrosis treatment in Physical Medicine and Rehabilitation.

PP050
NATURE AS A BENEFIT FOR HUMAN HEALTH: REVIEW

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Introduction: During the last few decades, numerous studies have been made concerning the benefits that close contact with a relaxing and peaceful natural environment has on human health.
Purpose: The goal of this article was to review studies showing that the natural environment has a positive effect on health, establishing homeostasis in almost all systems of a human organism, improving therapeutic treatment and rehabilitation outcomes and increasing the length and quality of life. These positive effects were substantiated with objective scientific evidence in many reviewed studies.
Methods: The review was based on a method used by the NHS Centre for Reviews and Dissemination, a world renowned institute that produces policy relevant research and innovative methods that advance the use of research evidence to improve population health. This method involves a systematic examination of selected databases using keywords, subject headings and references chosen from the primary paper.
Results and discussion: The article presents a summary of empirical and theoretical evidence from international literature. The collected data showed that humanity evolved in adaptive response to natural conditions and stimuli, which are essential for health, productivity, emotional and intellectual well-being and survival. For assessment of the positive effects of nature on health different physiological indicators were tested. Data confirmed that Nature influences: the nervous system (providing better brain activity, increased cognitive reserve, reduced negative effects of mental stress, better relaxation and sleep, decreasing incidence of anxiety and depression, delaying brain aging and onset of dementia, crime and increasing social cohesion); endocrine system (decreasing blood adrenaline, cortisol, glucose, dopamine, glycated haemoglobin and triglycerides, increasing HDL-C and decreasing the risk of type 2 diabetes and atherosclerosis); cardiovascular system (decreasing pulse rate and blood pressure); immunity; incidence of allergies, asthma and chronic obstructive pulmonary disease.
Conclusions: Nature plays a vital role in human health and well-being. evidence from international literature. The collected data showed that humanity evolved in adaptive response to natural conditions and stimuli, which are essential for health, productivity, emotional and intellectual well-being and survival. For assessment of the positive effects of nature on health different physiological indicators were tested. Data confirmed that Nature influences: the nervous system (providing better brain activity, increased cognitive reserve, reduced negative effects of mental stress, better relaxation and sleep, decreasing incidence of anxiety and depression, delaying brain aging and onset of dementia, crime and increasing social cohesion); endocrine system (decreasing blood adrenaline, cortisol, glucose, dopamine, glycated haemoglobin and triglycerides, increasing HDL-C and decreasing the risk of type 2 diabetes and atherosclerosis); cardiovascular system (decreasing pulse rate and blood pressure); immunity; incidence of allergies, asthma and chronic obstructive pulmonary disease.

PP051
PES ANSERINUS TENDINITIS/BURSITIS AFTER TOTAL KNEE ARTHROPLASTY: MESOTHERAPY TREATMENT – OUR EXPERIENCE

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Introduction: The term pes anserinus refers to the conjoined insertion of the sartorius, gracilis and semitendinosus muscles along the proximal medial aspect of the tibia. Pes anserinus tendinitis/bursitis is a common cause of knee pain and its development is associated with many causes, including gonarthrosis and, sometimes, the subsequent total knee arthroplasty (TKA). Mesotherapy is a minimal invasive technique that consists of subcutaneous injection of drugs with the objective of prolonging their effects at local level.
Purpose: To determine the efficacy and safety of mesotherapy with ketorolac and lidocaine for pes anserinus tendinitis/bursitis associated with TKA, refractory to conservative treatment.
Methods: We conducted a retrospective study where we evaluated 42 patients on our outpatient clinic, who were submitted to TKA. After exclusion criteria were applied, 8 patients remained. The WOMAC and VAS scales were assessed at baseline (3 weeks after initiating physiotherapy). Patients were submitted to mesotherapy at baseline, 2 and 4 weeks. The WOMAC and VAS scales were applied at 6 and 12 weeks and adverse events were recorded.
Results: 8 patients (8 TKAs), all women, were submitted to mesotherapy treatment and included in the present study. Mean age of 67.25 years and mean BMI of 27.6 kg/m^2. 4 TKAs were left and 4 right. Mean VAS values before mesotherapy treatment and at 6 and 12 weeks after were 7, 2.5 and 3.5, respectively. Mean WOMAC values before mesotherapy treatment and at 6 and 12 weeks after were 52.8, 25.6 and 38.2, respectively. The only adverse event was ecchymosis in the site of injection, in 2 patients.
Discussion and conclusions: Mesotherapy treatment with ketorolac and lidocaine for pes anserinus tendinitis/bursitis after TKA, refractory to conservative treatment, is a safe and effective technique.

PP052
MESOTHERAPY IN TIETZE SYNDROME - CLINICAL CASE

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Tietze syndrome is a benign, self-limited, nonsuppurative localized painful swelling of the upper costal cartilages of unknown etiology. It affects the costochondral, costosternal, or sternoclavicular joints. Mesotherapy involves the use of multiple intradermal or subcutaneous injections of a mixture of compounds in minute doses, by means of very fine needles, directly over/near the affected sites. We present a clinical case of a 35 year old woman, housekeeper, that went to an appointment with a non-traumatic chest pain with irradiation to the right shoulder. The site of the first costosternal was swollen and painful. Passive and active movements of the shoulder were painful, too. The X-Ray was normal. This kind of episodes were recurrent, and normally they used to pass after 7-10 days with oral NSAIDs. As the symptoms were so intense, we decided to do a Mesotherapy with a mixture of NSAID and Anesthetic. The patient referred improvements of the swelling and pain after some hours. She became asymptomatic the day after. This case shows the importance that Mesotherapy may have in these kind pathology, reducing the duration of the symptoms, and re-establishing the function.

PP053
ACUPUNTURE TREATMENT FOR POST-THORACOTOMY NEURALGIA IN A PATIENT OPERATED OF A PULMONARY ADENOCARCINOMA: A CASE REPORT

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Introduction Pain in patients with pulmonary cancer is multifactorial, being post-thoracotomy neuralgia a frequent complication, derived from the surgery, hence on some occasions, being difficult to handle, affecting the patient´s quality of life. Recent literature on the subject shows that acupuncture may be applied as a complimentary treatment or integrated with in the symptoms derived from the tumoral disease, so allowing a symptomatic relief.
Purpose To assess if post-thoracotomy neuralgia in a patient operated of a pulmonary adenocarcinoma improves with acupuncture.
Materials and methods A 75-year old male diagnosed with right lung adenocarcinoma (pT1aN0M0) with right pneumonectomy (2013) and six cycles of adjuvant chemotherapy (QT). After surgery neurophatic pain appears on the thoracotomy area, radiating to right shoulder together with articular limitation, with a set of symptoms that do not improve with conservative measures (analgesics, kynesiotherapy, mesotherapy). Two years later the patient is referred to us by thoracic surgery for physical sequelae. We decided to begin treatment with acupuncture with a minimum of 6 – 20 minute sessions. We did one session a week, with a Ener-Qi 0.26x0.25mms needle and the following points: 4 points around the surgical scar and also 20DM; 17RM; 7P right; 3ID left ; 13V, 6B y 36 E bilateral.
Results As from de the second session, the pain diminished, according to the VAS scale with an average of 2 points out of 10, with an articular increase of the shoulder and reducing the pharmacology intake which lasted three and a half months.
Discussion and conclusions Acupunture is a frequent procedure, free from important side-effects which may improve many affections. In patients with a post-thoracotomy neuralgia refractory to conservative treatment acupuncture can become an effective alternative treatment to invasive treatments (neural block). It is a simple procedure that can be easily carried out on the rehabilitation consultations on an outpatient basis.

PP054
COMPLEX INTERVENTIONS IN REHABILITATION MEDICINE - MINDFULNESS-BASED INTERVENTIONS IN PEOPLE WITH MULTIPLE SCLEROSIS

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Introduction: Multiple sclerosis is stressful. Comorbidity is common. Managing stress can improve quality of life (QOL). Effective treatments are sparse; the best existing evidence is for cognitive behavioural therapy. Mindfulness-based interventions (MBIs) are effective in other long term conditions (LTCs). Outlining their use MS is a research priority.
Purpose: Rigorously evaluate the use of MBIs in people with MS.
Methods: Based on the UK Medical Research Council guidelines (2008) on developing and evaluating complex interventions, including: 1) systematic review of effectiveness of MBIs in MS; 2) a cross-sectional analysis of a nationally representative primary care database (n=1,751,841), assessing prevalance of 39 other LTCs in people with MS, versus age, sex, and deprivation-matched controls. 3) a pragmatic, pilot randomised wait-list controlled trial (RCT) of an MBI (n=50), testing feasibility of trial procedures and likely effectiveness (perceived stress, QOL, fatigue, mental health, emotionalism, mindfulness, self-compassion), MBI completion, and 3-months post intervention; 4) assessing MBI acceptability and accessibility via thematic analysis of 19 nested, semi-structured stakeholder interviews
Results: 1) A small international literature (n=3) supports MBIs in MS, with significant and sustained improvements in mental, physical, and psychosocial domains; 2) Mental health comorbidity is extremely common in MS in Scotland; 3) An MBI for people with MS is feasible under trial conditions, with gold standard (>80%) levels of recruitment, adherence, retention, and follow-up. Significant improvements were noted in mindfulness, self-compassion, mental health, and fatigue; 4) Existing MBI approaches need modified in MS populations.
Discussion and conclusions: Comorbidity is very common in MS. MBIs can help with mental, physical and psychosocial domains of MS. MBIs can be tested under trial conditions in MS. Standard MBIs need modified for people with MS and modifications should be informed by those with the condtion, and those who regularly care for them.

PP055
ROLE OF ACUPUNCTURE IN PERIARTHRITIS OF SHOULDER AFTER TRAUMA – CASE REPORT

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A 88 year old women presented with a 7-month history of very painful left shoulder and very limited range of motion, which have been developed after fall in January 2015. Orthopaedic examination and radiography didn't show any fracture on bones of left shoulder. Laboratory examinations were in normal range. She didn't have any comorbidities and didn't take any medications. During a period of 6 months she went through a three cycles of physical therapy (10 days each cycle), with concomitantly usage of topical NSAIL, without any improvement. Physical examination revealed a restricted range of motion (ROM): she was able to elevate left, stretched arm up to 90 degrees throught flexion, and up to 45 degrees throught abduction. Extension was normal, but active external and internal rotation were very limited and painfull. She is right handed and she had mild paresis of hole left arm. There was no sensory deficits. In july she strated with acupunture treatment. Visual analog scale (VAS) was used as a measure for pain intensity and initially it was 7 on VAS. After second administraton of acupunture she can easily elevate hands in full ROM, above her head. Acupuncture treatment included points Li 4, Li 11, Li 14, Li 15, Sj 14, Sj 5, St 38, GB 34 and local „ah shi“ points (trigger points). The needles were 0.25 mm in diameter and 25 mm in length (DongBang AcuPrime Ltd.). Acupuncture was applicated for 20 minutes, 10 days continuously. It was noticed that the patient can easily elevated left arm after inserting the needle in St38 point. After treatment course the pain was 4 on VAS and she had full ROM in left shoulder. In conclusion, acupuncture showed good efficacy in periarthritis of shoulder in releieving pain and improving functional activity of humeroscapular joint.

PP056
THE ROLE OF ACUPUNCTURE DURING REHABILITATION OF TOTAL KNEE ARTHROPLASTY PATIENTS

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Introduction: In rehabilitation of patients undergoing total knee arthroplasty (TKA), the main hindrance is often represented by the pain and the stiffness of the operated limb. Many studies regarding acupuncture proved its efficacy in pain reduction during treatment of knee Osteoarthritis, but just few of them studied its role in the rehabilitation after TKA.
Purpose: Proving the efficacy of acupuncture in reducing pain, stiffness and swelling of the operated limb and in improving the general physical functioning of patients undergoing TKA
Methods: Patients are assessed on preoperative day with KOOS scale and Time Up and Go test (TUG) as physical function evaluation, with NRS scale as pain measurement, ROM and knee circumference at the upper border of the patella as stiffness and swelling measurement. Then they are randomly allocated into the Control or to the Acupuncture group, where, as additional therapy, they are treated 3 times per week from postoperative day 5 to postoperative day 20. Each treatment consist in the insertion of sterile disposable acupuncture needles in adjacent and distal areas to the operated knee for 30 minutes. Patients would be evaluated for follow up 2 months after TKA.
Results: The study is currently ongoing. Increasing the records, we expect to reinforce the nowadays weak evidence about the positive influence of acupuncture during the acute phase of rehabilitation, at postoperative day 20. Furthermore we're creating new evidence about its role on the long term rehabilitation.
Discussion and conclusions: Acupuncture can be provided as a valid therapeutic tool improving the whole rehabilitation treatment of TKA patients.

PP057
TREATMENT OF TENSION HEADACHE BY NEUROLYMPHATIC STIMULATION: PILOT STUDY

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Introduction The literature has shown that 37% of cases tension-type headaches are accompanied by an increase of muscular tension in peri-cranial and neck muscles. The data highlight how in people suffering from tension-type headaches, can be present biochemical and neuroendocrine alterations, able to determine a disorder on the body's response mechanisms to general stress conditions.
Aim The aim of the study is to assess the effects of manual lymphatic drainage applied to the head and neck in the treatment of tension-type headaches.
Methods 10 patients were selected (of both sexes, aged between 24 and 50 years) diagnosed with episodical, frequent or chronic tension-type headache, were selected. Patients were selected according to "headache impact test" and the HIT-6 and an instrumental evaluation using Myoton for tone, elasticity and strength of certain muscle groups assessement, such as upper trapezius, suboccipital, thunderstorms, sternocleidomastoid. Patients with score => 50 were included. Patients were treated twice a week for three weeks.
Results At the end of the treatment period there was a reduction in the level of head pain. As regards the evaluation with HIT-6 it went from an average score of 60 to an average score of 45.3 found in the last assessment.
Discussion and conclusions Results show that the choice of treatment with neuro-lymphatic stimulation allows to obtain a significant reduction in pain intensity and frequency of attacks of headaches.

PP058
COMPARATIVE ANALYSIS OF THE INFLUENCE OF BALNEOTHERAPY AND HYDROKINESIOTHERAPY OF BANJA KOVILJACA ON BLOOD PRESSURE VALUES

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Introduction Unregulated blood pressure can be counter-indicated for the application of general hydro and balneo procedures.
Purpose To examine the influence of bathing in pools with sulphuric and hygienic water on blood pressure values.
Methods The research was conducted at Specialized Rehabilitation Hospital Banja Koviljaca, in Serbia, during 2013 and 2014. There were 60 participants included in the study, who were divided into two groups. One group used the pool with sulphuric thermo-mineral water, temperature 35°C, depth 115 cm, and the other group used the pool with hygienic water, temperature 32°C, depth 140 cm. Blood pressure values were measured using automatic digital device Omron M3. The measurements were done on the left upper arm before bathing, 5 minutes into bathing, at the end of the bathing in the pool (20 minutes), and after 15-minute rest. The results were statistically processed (Student T-test and variance analysis).
Results In patients that used sulphuric thermo-mineral water, we have noted a constant and statistically significant drop in systolic and diastolic pressure which is the most prominent after bathing and short rest. In patients who used hydrokinesiotherapy in thermal hygienic water, we have observed a statistically significant drop in systolic blood pressure after 5 minutes of therapy, which after bathing and short rest returns to the original values. A similar occurrence happens with diastolic pressure as well, only without a statistically significant result.
Discussion and conclusions Bathing in sulphuric thermo-mineral water of Banja Koviljaca causes the decrease in blood pressure, both systolic and diastolic. Bathing in warm water should not be counter-indicated in patients with mild increase in blood pressure.

PP059
HOW TAI CHI IMPROVES BALANCE: A "BODY-MIND" APPROACH

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Introduction: Tai Chi is a martial art with a chivalrous aspect, originating in ancient China, with principles from traditional chinese medicine and from taoist philosophy. It is characterised by exercising through adequate movement, free breathing and relaxation, and not by using sheer force or muscular tension. This makes it one of the most perfected martial arts, allowing the weak to beat the strong by using gentleness and flexibility to win over brute force. Tai Chi is now used as gymnastics for health, as its soft movements can be practiced slowly.
Purpose: To understand how Tai Chi can improve balance, as it is kown to reduce falls since 1996.
Methods: We electronically searched Medline, PubMed, and reviewed abstracts and articles published from 1995 to October 2015 and only the studies that analysed Tai Chi effects on balance were selected.
Results: Considerable amount of studies examined the potential of Tai Chi, but only few analysed the way it can improve balance. The practice of Tai Chi improves static balance (better than ballroom dancing), with better stability and larger movements, it also improves dynamic balance, with different strategies (proactive as well as reactive). In clinical practice, Tai Chi can prevent falls in Parkinson disease and in elderly, better than computerized balance training. And even if (in some studies) Tai Chi has no better apparent benefit on postural stability in older subjects, it has another benefit: after Tai Chi, people have less fear to fall (than after computerized balance training).
Discussion and conclusions: Tai Chi can improve balance not only through a "body training" (proprioception, ankle strength, anticipatory postural adjustement, visual and vestibular adaptation, etc.), but also through a "mind training" (less fear, less anxiety, improving sleep and humor, better stress management).

PP060
EFFECT OF ACUPUNCTURE COMBINED WITH REHABILITATION TRAINING ON UNILATERAL SPATIAL NEGLECT

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Introduction Unilateral spatial neglect (USN) as one of the most common cognitive and behavioral disorders after stroke, seriously affect the recovery of motor function and activities of daily living in patients.In our study, acupuncture combined with rehabilitation interventions in stroke patients with USN, explore the effect of acupuncture treatment on rehabilitation of stroke patients with USN and its possible mechanisms.
Purpose To explore the effect of acupuncture combined with rehabilitation training on USN.
Methods 100 stroke patients with USN were divided into treatment group (n=50 and control group (n=50). Both groups were treated with rehabilitation training for 4 weeks. The treatment group was treated with acupuncture combined with rehabilitation training. Digital elimination test Remove line test The Fugl-Meyer assessment (FMA) the modified Barthel index (MBI) and the incidence of shoulder pain of the two groups were evaluated before and after the treatment.
Results During treatment, two cases of the observation group off, shedding 4.00 percent rate, three cases of the treatment group off, shedding 6.00 percent rate, both expulsion rate <20%. Before and after treatment, the scores of Digital elimination test and Remove line test of the two groups decreased significantly ($P<0.05$), FMA scores, MBI scores significantly increased ($P>0.05$), the incidence of shoulder pain in control group increased ($P<0.05$) but in treatment group not significantly changed ($P>0.05$) after the treatment. The treatment group improved more significantly USN degree, the scores of Digital elimination test and Remove line test were lower ($P<0.05$), FMA and MBI scores were higher ($P<0.05$), the incidence of shoulder pain decreased ($P<0.05$), compared with the control group.
Discussion and conclusions Acupuncture combined with rehabilitation training can significantly improve symptoms of stroke patients with USN, improve hemiplegic limb motor function and activities of daily living.

PP061
POST-TRAUMATIC MYOSITIS OSSIFICANS : IMAGING METHODS DIAGNOSTICS AND FOLLOW UP

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Introduction: Post-traumatic myositis ossificans (PTMO) is a condition that in 11-22% follows traumatic brain injury. Hip region is the most commonly affected. Imaging studies are crucial for distinct staging of maturity of the lesion and therefore appropriate intervention.
Purpose: to describe phases of PTMO by using high resolution ultrasound (HRUS), power Doppler, radiographs and Multisliced Computed Tomography (MSCT) and discuss their usage in distinct phases.
Methods: case report of spastically quadriplegic 17-year old patient after severe traumatic brain injury who developed PTMO. Follow up consisted of using imaging methods of PTMO 3 months, 6 months and 9 months after traumatic brain injury.
Results: in early stage PTMO high resolution ultrasound (HRUS) showed heterogeneous hypoechoic soft tissue masses with hyperechoic core. Positive power Doppler signal was detected. By maturing peripheral lamellar calcification and posterior acoustic shadowing was seen using HRUS. In the late, mature stage completely calcified periphery with acoustic shadow were seen. Power Doppler signal was negative. Early radiographs showed soft tissue edema and faint peripheral calcification. By maturing of the lesion well-defined peripheral calcification with coarser central calcification developed. In the late phase PTMO presented as dense calcified lesion in whole. MSCT in early stage showed pale calcification and soft tissue swelling. Maturing of the lesion showed peripheral calcified rim with central zone isodense to muscle. In mature phase dense ossificate is present.
Discussion and conclusions: ultrasound combined with power Doppler is the most usefull diagnostic imaging modality for early, immature phase PTMO diagnosis and evaluation of the maturity of the lesion. MSCT optimally evaluates both calcifications as well as soft tissue.

PP062
CORTICOSTEROID INJECTION OF THE SUBACROMIAL-SUBDELTOID BURSA IN ADULTS WITH SHOULDER PAIN – LITERATURE REVIEW

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Introduction – Shoulder pain is a common symptom worldwide and can have several etiologies. Corticosteroid injections in the subacromial-subdeltoid bursa are used as treatment for shoulder pain and are one of the most frequent local injections administered in daily clinical practice. These injections can be performed with image-guidance or with landmark-guidance (blind) and this may result in different outcomes.
Purpose – To perform a literature review accessing the role of subacromial-subdeltoid bursa injections in the treatment of shoulder pain and to compare the effectiveness and safety of image-guided versus blind injections of the bursa.
Methods – It was made a bibliographic research using PUBMED CENTRAL online resources. Search items included combinations of the words: "Corticosteroid"; "injection" "Ultrasound", "bursa", "shoulder". Additional studies were identified by searching bibliographies of relevant articles.
Results – From the research, resulted 125 articles. We only chose articles written in English, and published since the year 2000. We decided to include randomized controlled trials comparing the clinical effectiveness and safety of ultrasound and landmark injections. It was excluded case reports. In the end, there were 15 relevant articles.
Discussion and conclusions – Corticosteroid injection in the subacromial-subdeltoid bursa is effective in reducing shoulder pain and improving function especially in short-term follow-up. Ultrasound-guided injections potentially offer safety and greater clinical improvement over blind injections.

PP063
SUPRASPINATUS MUSCLE THICKNESS ASSESSMENT ON THE OVERHEAD ATHLETS' DOMINANT VERSUS NON DOMINANT SHOULDER

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Introduction. The supraspinatus, as one of the most important rotator cuff muscle, frequently demonstrates clinical outcomes like injuries and disorders affecting its strength and shoulder functionality. The supraspinatus muscle thickness (MT) could consider as a critical anatomical factor of determining strength production (Tae et al. 2012). Limited studies have reported the differences on the supraspinatus MT as indicator factor of strength, which is highly correlated with the anatomical cross sectional area (ACSA), between the dominant and non dominant shoulders (Yanagisawa, et al 2009;2014). So, the purpose of this study was to explore the differences in the supraspinatus MT -between the dominant and non-dominant shoulder on tennis players using brightness-mode ultrasonography (US).
Methods. US images from the supraspinatus ACSA and MT at the scapular notch were recorded in 20 tennis players, 23-27 years of age, who were involved in tennis for more than five years. Standardized methods by Tae Im Yi et al. 2012 and Papatzika et al. 2015 were used to gather US measures on both shoulders. The Pearson Correlation Coefficient (PCC) was obtained to identify the intra-rater correlation of the supraspinatus MT. The mean differences were examined using t-test for paired samples.
Results. The PCC showed a strong relationship for the dominant (r= 0.94) shoulder and for the non dominant one (r=0.93) respectively. The average supraspinatus MT of the dominant shoulder was 1.52±0.31cm and that of the non- dominant 1.38±0.30cm. Significant statistical differences were observed on the supraspinatus MT of the dominant shoulder compared with the non-dominant one (t=8.363, [2-tailed] $p<0.05$).
Conclusions. The findings of this study should provide evidence for the evaluation of the supraspinatus MT using US in many scientific objectives related in specific shoulder training exercise protocols or rehabilitation regimes regarding supraspinatus muscle atrophy or hypertrophy and in the interpretation of various imaging interventions.

PP064
A PILOT STUDY : CROSS-SECTIONAL AREA OF MEDIAN NERVE AS A PROGNOSTIC FACTOR FOR STEROID INJECTION IN CARPAL TUNNEL SYNDROME

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Purpose: We aimed to investigate whether the ultrasonographic cross-sectional area (CSA) of median nerve could be a prognostic factor of carpal tunnel syndrome (CTS) after steroid injection.
Methods: We consecutively recruited 25 wrists of 20 patients (mean age 57.7 years, 13 females and 7 male) with CTS. All of the participants received carpal tunnel steroid injection. Ultrasonographic cross-sectioal area (CSA) of median nerve was measured at maximal swelling site around wrist. Visual analogue scale (VAS) and VAS (Visual analogue scale) and Boston Carpal Tunnel Questionnaire (BCTQ) were asked to the patients before and 4 weeks after the procedure. According to CSA of median nerve at pre-injection, we divided the patients into 2 groups: mild (CSA (mm2) < 13.0) and moderate to severe (CSA (mm2) ≥ 13.0, group 2). We compared the changes of parameters in relation to steroid injection between the groups.
Results: All participants in mild group (N = 13) showed significant improvement in all assessments (VAS: from 5.7±2.3 to 2.7±0.8, CSA (mm2): from 11.1±1.5 to 9.0 ± 12.0, BCTQ: from 3.1±0.5 to 1.8±0.4 in symptom status and from 2.5 ± 0.8 to 1.4 ± 0.3 in function status, $p < 0.05$). However, patients with mild to severe CTS (N = 12) showed significant improvements only in subjective assessments (VAS: from 6.0±1.0 to 2.8±1.3, BCTQ: from 3.0±0.6 to 1.8±0.1 in symptomatic status and from 3.0 ± 0.3 to 1.7 ± 0.2 in functional status, $p < 0.05$). On the other hand, medial nerve CSA showed no significant difference (from 16.4±1.3 to 14.7±3.4, $p = 0.225$).
Conclusions: The CSA of median nerve could be the prognostic factor for steroid injection in CTS. Further larger size study would be needed to investigate optimistic CSA value for steroid injection.

PP065

COMPARISON OF ULTRASONOGRAPHIC MEASUREMENTS OF ULNAR NEUROPATHY AT THE ELBOW: RELATIONS TO ELECTROPHYSIOLOGIC LESION-TYPE AND SEVERITY.

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Objective: Ulnar neuropathy at the elbow (UNE) is the second most common entrapment neuropathy. Recently, a few studies reported that ultrasonography may reflect the type and degree of neuropathy. The aim of this study is to investigate whether ultrasonographic findings of ulnar nerve could provide information about type of lesion and electrophysiological severity in UNE.
Methods: Seventy-one arms of sixty-three UNE patients (male: 43, female: 20, mean age 47.3±14.6 years) were recruited. According to electrophysiologic findings, they were classified to demyelinating type and axonal type. To assess the degree severity, we evaluated electrophysiological severity score (ESSS). Ultrasonographic evaluation was performed to measure ulnar nerve CSA at maximal swelling point (CSAmax) around the elbow and CSA of mid-humerus (CSAmh). We compared the ultrasonographic findings between the axonal and demyelinating groups. Additionally, the correlation analyses were conducted among the ultrasonographic findings, electrophysiologic parameters and ESSS.
Results: In accordance with the electrophysiologic findings, there were 43 arms of axonal injury and 28 arms of demyelinating lesion. The CASmax and the ratio of CSAmax to CSAmh (CSAmax/CSAmh) were significantly lager in axon group (17.6±7.3 mm2 and 2.7±0.9 mm2) than demyelinating group (14.3±5.0 mm2 and 2.2±0.7 mm2, $p < 0.05$). In correlation analysis between ultrasonographic findings and electrophysiologic parameters, both the CSAmax and CSAmax/CSAmh were significantly correlated with amplitude of distal compound motor action potential, distal motor conduction velocity, sensory nerve action potential (SNAP) amplitude, and SNAP latency ($p < 0.05$). However, in correlation study of ultrasonographic findings and electrophysiologic severity, only the CSAmax/CSAmh revealed the significant correlation with ESSS ($p < 0.05$).
Conclusions: In UNE, ultrasonography could reflect electrophysiologic pathophysiology. Especially, the CSAmax/CSAmh would be more useful ultrasonographic parameter that could provide information about the type and severity of neuropathy.

PP066
USEFULNESS OF ULTRASOUND MEASUREMENT OF THE TRANSVERSE MUSCLE IN CONTINENT AND INCONTINENT WOMEN: PILOT STUDY

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Introduction Urinary incontinence is the most frequent genitourological dysfunction in women. Studies with electromyography show that there is a synergetic contraction of abdominoperineal muscles. Any factor that may affect the anatomic integrity can cause incontinente.
Purpose To observe if there is a synergetic contraction of the abdominoperineal muscles. Compare if there are changes in the thickness of the transverse abdominal muscle in response to pelvic floor muscles (PFM) contraction in women with and without incontinence. To assess whether there are predictive variables in the change of the thickness of this muscle.
Methods A descriptive study in 30 women: 15 continents and 15 with clinical diagnosis of stress urinary incontinence. Transverse measurements (cm) have been recorded with Premium ultrasound LOGIC Q5 linear transducer frequency 12 MHz with the PFM at rest and in contraction. We've measured concomitantly the strength of the PFM using Oxford scale. The statistic analysis was performed using the SPSS version 12.0 for Windows using non-parametric tests: U- Mann-Whitney (Wilcoxon independent data) (for paired data) and Spearman's rank correlation. Statistical significance was defined as $P<0.05$.
Results We observed a synergistic abdominoperineal contraction. The thickness (cm) of transversus abdominalis, with PFM at rest, in continent women is lower than in incontinent group, average 0.32±0.10 versus 0.34±0.11. In contraction of PFM continues to maintain this difference by increasing the thickness of the transverse in both groups $p<0,05$. We have not objectified predictive variables in terms of thickness (age, BMI, parity, oxford,…).
Discusion and conclusions There is a synergystic abdominoperineal contraction in both groups. There is a statistically significant change in thickness of transverse muscle between rest and contraction of PFM regardless of continence. It is necessary to increase sample size the to objectify predictors of muscle thickness and pelvic floor dysfunction in incontinent women.

PP067
ULTRASOUND-GUIDED INFILTRATION IN SUBCORACOID IMPINGEMENT: TECHNIQUE DESCRIPTION AND CASE REPORT

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Introduction: Subcoracoid impingement is an unrecognized and under-diagnosed cause of anterior shoulder pain. Is aggravated by movements in forward-flexion, adduction and internal rotation. The diagnosis is firstly clinical. The subcoracoid infiltration can relieve the pain and help to establish the diagnosis. Sometimes we need to do imaging test, because is possible that suprascapularis tendon is damaged, thus necessitating coracoplastia.
Purpose: The objetive is to present the technique description of the subcoracoid space infiltration with ultrasound-guide and to present a case report.
Methods: A 57 year old man that 3 months before suffered a right shoulder pain, located in anterior area. It started without any preceding injury or trauma and was related with movements, specially when he was driving and was turning the steering wheel. At physical examination, he had a complete shoulder mobility, the lift-off test was positive and the pain got worse with internal rotation movements. The palpation over subcoracoid area increased the pain. We performed an infiltration at the subcoracoid area. Technique description. We use a linear transducer at frequency of 10 MHz. The patient is in sitting position, turned his back to us. The transducer is in transverse axis of the proximal and anterior shoulder. The subcoracoid space is between the coracoid and the humerus head. Once identified the space, we proceed to perform the infiltration with 1 ml of mepivacaine and 1 ml of triamcinolone.
Results: 2 weeks after, the patient was asymptomatic. We gave him exercises to strengthen the external rotators muscles of shoulder. We reviewed the patient 2 months later and he was asymptomatic.
Discussion and conclusions: Treatment of subcoracoid impingement with ultrasound-guided is a promising and safe method to relief this kind of pain. Further studies are required to assert that this technique is effectively to treat patients who suffer this impingement.

PP068
THE ADVANTAGE OF ULTRASOUND-GUIDED INJECTION IN THE TREATMENT OF MORTON'S NEUROMA. A SIGNIFICANT CASE IN POINT.

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Introduction: Morton neuroma is a perineural fibrosis and nerve degeneration of the common digital nerve. Within the scope of Physical and Rehabilitation Medicine (PRM) intervention, modification of footwear is usually recommended, however, due to footwear specificities of the competitive sport, this is not always a practicable solution for an athlete. Another treatment approach involves corticosteroid/anesthetic mix injection of the Morton's neuroma. It is highly important that the injection is delivered precisely between the nerve and the perineural tissue causing nerve compression.
Purpose: The authors present a clinical case elucidating the benefits of ultrasound-guided injection over blind injection. Clinical Case: A 31 year old professional futsal player presented with neuropathic pain in the distribution of the interdigital nerve between the third and fourth metatarsals of the right foot, preventing him from carrying out his sport activity. The diagnosis of Morton's neuroma was confirmed by MRI. Modification of footwear was not feasible. The patient had been previously treated with two blind corticosteroid/anesthetic mix injections with no improvement; treatments within the scope of PRM were administrated equally with no success. The patient was referred to the Pain Management Unit. An ultrasonographically guided of local anesthetic and steroid mixture injection was performed and the patient experienced immediate pain relief and partial resolution of complaint. At three months the patient had only slight complaint with no activity limitation after treatment.
Discussion and conclusions: Blind percutaneous therapeutic injections have been performed with relatively poor overall clinical outcomes. Ultrasound is a quick, reliable method for guiding percutaneous Morton's Neuroma injections. The ability to directly visualize the neuroma and needle tip placement allows for confident placement and verification of the anesthetic-steroid mixture into the neuroma. It is this improved injection accuracy that we feel contributed to our good short-term clinical outcome following a single ultrasound-guided injection.

PP069
ULTRASONOGRAPHIC EVALUATION OF RADIAL NERVE IN PATIENTS WITH UNILATERAL REFRACTORY LATERAL EPICONDYLITIS

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Introduction: Ultrasound (US) can provide clinically valuable imaging for tendons and tendon insertions, peripheral nerves, and therefore it has become an attractive supplementary tool for electrodiagnostic studies.
Purpose: The aims of this study were to evaluate the common extensor tendons (CETs) in clinical evidence of refractory lateral epicondylitis (LE), to measure the cross-sectional area (CSAs) of radial nerve (RN) at the levels of the spiral groove and bifurcation, and furthermore to determine whether US findings were related with clinical/electrophysiological parameters.
Methods: Fourty-four consecutive patients (29 female and 15 male; mean age 47.5±9.95 years) with unilateral symptoms of refractory LE were included. All patients underwent a detailed clinical assessment, electrodiagnostic and US studies. Pain intensity (visual analog scale, 0: no pain - 100 mm: maximum pain); local tenderness (0-3 point scale: absent, mild, moderate, severe); grip strength (with a Jamar Dynamometer) were performed in each patient. The sonographic CET thickness, and morphologic characteristics, and CSAs of the RN in two different regions were obtained bilaterally. The values concerning to the unaffected sides were taken as controls.
Results: CET thickness and CSA values of the RN on both interested levels were larger on the affected sides (all, $p<0.001$) compared to the unaffected sides. Age was positively correlated for CSA values at the spiral groove ($p=0.039$), and negatively correlated for motor amplitude ($p=0.024$) as well as there was positive correlation between symptom duration and motor conduction velocity ($p=0.040$), all with regard to the affected sides.
Discussion and conclusions: Refractory LE seems to show inhomogeneous CET and CSA enlargement in RN at the spiral groove, and bifurcation. The information provided in this study may provide insight into better understanding the refractory pain in this group of patients.

PP070
DIABETIC PERIPHERAL NEUROPATHY: CORRELATION BETWEEN ULTRASOUND FINDINGS AND CLINICAL FEATURES

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Introduction: The current study aimed to evaluate the cross-sectional area (CSA) of peripheral nerves in people with diabetic peripheral neuropathy (DPN) using US and correlate the CSA with clinical and demographic data.
Methods: Patients with DPN (n=53) and a matched healthy control group (n=53) underwent US imaging of the sciatic, tibial and median nerves. CSAs of the nerves were recorded,nd the associations between pain intensity (VAS), the Leeds Assessment of Neuropathic Symptoms and Signs (LANSS) pain scale, DM duration, BMI, HbA1c and blood glucose levels were evaluated.
Results: CSAs of the nerves were larger than those of the healthy individuals ($p<0.05$). No correlations were found between the CSA of nerves and the mentioned parameters ($p>0.05$). VAS and LANSS pain scores were not correlated with the CSA of peripheral nerves ($p=0.32$; $p=0.31$).
Discussion: US is a sensitive diagnostic technique for DPN; however, it does not indicate the severity of the disease.

PP071
ASSESSMENT OF D TYPE PERSONALITY PREVALENCE

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Introduction: Cardiac and circulatory diseases form the most significant public health problem and nowadays psychological stress - negative emotions, including depression, anxiety, and anger may predict the development and progression of cardiovascular disease (CVD). Such specific traits as hostility and anger are characterized for Type D personality.
Purpose: To explore the prevalence of type D personality in persons without previously diagnosed cardiovascular disease in Latvia.
Methods: The study included 204 participants from the general population in the range 30-65 age without previously diagnosed CVD. They all filled out the DS14 questionnaire, containing 7-item NA (negative affectivity) and SI (social inhibition) subscales. They also completed other psychological tests and other measurements to screen other cardiovascular risks (CVR).
Results: In a study participated 204 respondents, 68% (n=138) were women and 32% (n=66) men. The mean age of participants was 43,7 (SD 7,7). Using a cutoff of 10 (NA 10 and SI 10), 27% (n=55) were classified as Type D and 36% (n=74) had risk to Type D personality (either one of NA or SI were above 10).
Discussion and conclusions: At this moment there is no united opinion about optimal screening instrument of psychosocial factors in cardiovascular disease prevention. DS14 can be used for type D personality screening in cardiology, preventive medicine. In order to get targeted psychosocial factor screening, doctors should get acquainted with psychosocial risk factor screening instruments and use them for next studies. It is necessary to evaluate association between type D personality and other CVR factors in longer period of time for several health outcomes.

PP072
EVALUATION OF SPINAL CORD PATIENTS AND CAREGIVER USING SHORT-FORM 36

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Introduction Spinal cord injury patients (SCIP) whose central nervous system is injured due to the unexpected unfortunate accident or the congenital disease happen every years. These SCIP have a serious effect on the patient's family and main caregivers in charge of nursing including the patients' physical & mental problems. The role of the main caregivers works as the biggest factor as a main factor of the successful rehabilitation and the health promotion. However, the main caregivers can be the 2nd victim due to a lot of physical and mental pains and burdens because they nurse the patients for a long time. It is reported that if the burden degree on nursing increases, the quality of life of main caregivers declines. While there have been many studies about the life quality of SCIP until now, the studies on the life quality of main caregivers for patients are poor.
Purpose In this study, since the main caregiver's life is closely related to the patient's life, the physical and mental condition of main caregivers will be evaluated to recognize the life quality problem of main caregivers and to research the improvement on the life quality of the disabled.
Methods Subjects: This study recruited 10 persons: 5 paretic due to the SCI and 5 main caregivers. They participated in the systematized program including the use of customized round-trip walking aid that is korea orthopedics rehabilitation engineering center reciprocating gait orthosis (KOREC-RGO) more than 1 year. Evaluation tool: Short Form-36: SF36 was chosen as an evaluation tool.
Results The results on before & after the program participation for 1 year were analyzed. In the 5-patients group, the scores in the physical, mental, and entire aspects increased, and the increase of mental aspect (39.5±7.5=>51.8±6.2) was more remarkable than the increase of physical aspect(28.5±5.4=>27.3±6.8) in the 5-main caregivers group.
Discussion and conclusions The life quality of the physical and mental aspect of the disabled was improved in the similar proportion through the making and use of round-trip walking aid(KOREC-RGO) and the participation in the systematized program. However, as for main caregivers, the score in the mental aspect was improved more than 10 score than the increase in the physical aspect. It is thought this result was created because the program participation was conducted with the object of promoting the disabled people's health and improving the physical function. It is thought the mental quality of life of main caregivers was heightened because their mental burden of nursing the disabled who could not move easily was relieved. In conclusion, it is important to improve the life quality of main caregivers as well as patients through the mutual improvement because the improvement of the main caregivers' mental health is closely related to the improvement of the entire life quality of the disabled.

Acknowledgments: This research project was supported by the Sports Promotion Fund of Seoul Olympic Sports Promotion Foundation from Ministry of Culture, Sports and Tourism. This work was supported by the Industrial Strategic Technology Development Program (No.10048732,Development of Smart Musculoskeleton Substitution Device for Functional Recovery and Assistance of Lower Limb) funded By the Ministry of Trade, industry & Energy (MI, Korea)

PP073
STROKE REHABILITATION ASSESSMENT IN THE ELDERLY

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Introduction: Cerebrovascular disease (CVD) is the third cause of death and second cause of disability and dementia in adults aged ≥65 years worldwide.
Purpose: Characterize the elderly patients hospitalized in the geriatric unit of El Carmen Hospital (GUECH) with a principal discharge diagnosis of stroke, who were referred for evaluation by physical and rehabilitation medicine (PRM) unit.
Methods: The analyzed population were 73 users from GUECH with a principal discharge diagnosis of stroke, who were referred for evaluation by PRM unit, between 16/01/2015 and 29/07/2015. It was used the Hospital database with access to the clinical records. Data were collected and analyzed in Excel spreadsheet 2013.
Results: The sample included 60 users, middle age 77 years. Average days of stay were 18, and the average latency days until assessment by physiatrist was 2. 58% were female, 78% with ischemic event. 83% previously walk. And 88% have previous history of hypertension. Only 5% of users were previously institutionalized and 95% lived at home. The discharge to home were 34%.
Discussion: We found that 43% of the patients aged ≥80 years. Most of the patients had the previous diagnostic of Hypertension and a previous stroke event, as the pre-existent literature. The study had some limitations. First, a significant number of patient had no evidence of stroke at the CT. Second, although collection of data was reliable, clinical record about provenance and discharge destination were insufficient.
Conclusions: Our study confirms that stroke is a prevalent disease and that hypertension is the principal comorbidity associated. Through this study we aim to propose the creation of a community CVD prevention program and a multidisciplinary team including a physiatrist with the implementation of an internal stroke protocol that includes a functional evaluation and inpatient comprehensive rehabilitation.

PP074
METHODOLOGY OF GRAVITATIONAL INCLINOMETER APPLICATION IN EVALUATION OF ANTERIOR-POSTERIOR SPINAL CURVATURE

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Introduction: Scientific achievements in the field of early detection of postural defects in the sagittal plane are not sufficiently disseminated. Numerous objectified methods are available to evaluate posture, however, they are often very expensive and not available for general practitioners. One of postural test methods which is low cost and easy-to-use is a mechanical or gravitational inclinometer.
Purpose: The aim of the study is to present the methodology for measuring anterior-posterior curvatures of the spine using gravitational inclinometer.
Methods: Gravitational, liquid, electronic inclinometers. Measurement accuracy up to 2 degrees. Measurement conducted in a relaxed habitual posture, legs extended in the knees, a subject's eyes looking perpendicular to the device.
Results: Determination of: ALPHA angle (S1), sacral inclination - (the upper inclinometer foot in the middle of the intervertebral space on the line connecting of the posterior superior iliac spines), the ALPHA angle (S2), the medial point of the sacrum on the line connecting the so-called Venus dimples (between the inclinometer feet), the BETA angle (TH / L) intervertebral space Th12- L1 (inclinometer on thoraco-lumbar transition in the middle between the inclinometer feet), GAMMA angle (7) intervertebral space C7-Th1 (top inclinometer foot on C7), DELTA angle (Th3) intervertebral space Th3-Th4 - inclinometer in the plateau of kyphosis, the upper foot right at the end of the convexity forming dowager's hump. To obtain the lumbar lordosis an angle - (S2) + (Th12 / L1), the thoracic kyphosis angle (Th12 / L1 + C7 or Th3 / Th4), the dowager's hump angle (C7 + Th3 / TH4)
Discussion and conclusions: Inclinometer allows to obtain fast, objective and non-invasive results characterizing the shape of the spinal curvatures, it allows for quick detection of dowager's hump. Taking into account anterior-posterior curvatures of dowager's hump in the measurements allows for accurate selection of physiotherapy to the actual shape of the thoracic kyphosis.

PP075
ELECTRODIAGNOSTIC STUDIES FOR PREDICTION OF OUTCOME AFTER TRANSFORAMINAL EPIDURAL STEROID INJECTION FOR LUMBAR RADICULOPATHY.

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Introduction and purpose We investigated the predictive value of components of electrodiagnostic studies for outcome after lumbar transforaminal epidural steroid injection in patients with clinically diagnosed lumbosacral radiculopathy.
Methods In 38 patients with clinical lumbosacral radiculopathy, visual analog scale (VAS) for pain, functional outcome by Roland Morris Disability Questionnaire (RMDQ), and Oswestry Disability Index (ODI) were evaluated after lumbar transforaminal epidural steroid injection in a retrospective study.
Results Subjects with clinical lumbar radiculopathy showed significant improvements of VAS. Of 38 patients tested with electrodiagnostic studies before injection, 28 patients were positive for lumbar radiculopathy and 10 patients had negative examination. There were significantly greater improvements of VAS and ODI for patients with a positive lumbar radiculopathy confirmed by the electrodiagnostic study. Each component of electrodiagnostic studies was not significant regarding VAS, RMDQ and ODI.
Discussion and conclusions Electrodiagnostic study of lumbar radiculopathy is a predictor of improvement in pain and functional outcome after transforaminal epidural steroid injection for lumbar radiculopathy. But component of electrodiagnostic studies, respectively, did not predict the improvement of pain and functional outcome in patients with clinical lumbar radiculopathy.

PP076
ULTRASONOGRAPHIC FINDINGS AND ELECTRODIAGNOSTIC SEVERITY IN CARPAL TUNNEL SYNDROME

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Introduction: In a previous study, we conducted several ultrasound measurements in healthy individuals and patients with carpal tunnel syndrome (CTS), including flexor retinaculum thickness and ratio of thenar to hypothenar muscle thickness. These measurements were then correlated with motor latency and cross-sectional area of the median nerve.
Purpose: The purpose of the present study was to investigate the severity of CTS with ultrasonographic evaluation of the median nerve, thenar muscle, and flexor retinaculum.
Methods: We assessed 160 dominant-hand wrists, of which 120 were electrodiagnostically graded as having mild, moderate, or severe CTS, while the other 40 were from healthy individuals. Ultrasonographic findings of the thenar and hypothenar muscles, flexor retinaculum, and median nerve were used to determine severity. An optimal discriminatory threshold, sensitivity, and specificity of ultrasound criteria for CTS were also determined.
Results: Thickness of the flexor retinaculum was 0.10±0.09, 0.15±0.04, 0.15±0.02, and 0.19±0.07 cm, and the ratio of thenar to hypothenar thickness was 0.99±0.11, 0.98±0.14, 0.93±0.12, and 0.82±0.14, in controls (n=40), mild (n=40), moderate (n=40), and severe (n=40) CTS, respectively. Flexor retinaculum thickness and cross-sectional area of the median nerve were significantly difference among the controls, mild, moderate, and severe CTS groups. However, there was no significant difference between mild and moderate groups. The ratio of the thenar to hypothenar thickness was significantly different between controls and each CTS group. This ratio was also significantly lower in the severe CTS group than in the others groups.
Conclusions: The ultrasonographic findings on the flexor retinaculum, the ratio of thenar to hypothenar thickness, and the cross-sectional area of median nerve are useful in diagnosing and evaluating the severity of CTS. Both the thickness of the flexor retinaculum and cross-sectional area of median nerve are highly correlated with the severity grade of CTS.

PP077
ELECTROPHYSIOLOGICAL FINDINGS IN HEREDITARY NEUROPATHY WITH PRESSURE PALSIES – A CASE REPORT

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Introduction: Hereditary neuropathy with pressure palsies (HNPP) is an autosomal dominant polyneuropathy usually caused by a deletion in the gene coding for the peripheral nerve myelin protein 22(PMP22).
Case description: A 29 year-old woman with bilateral hand numbness and weakness, with greater involvement of the third to fifth fingers, underwent an EMG to study the hypothesis of carpal tunnel syndrome and/or ulnar neuropathy. A moderate bilateral sensori-motor demyelinating neuropathy of the median nerve located on the wrist and a mild bilateral sensori-motor demyelinating ulnar neuropathy located on the elbow were found on the exam. Additionally, there was an increase in the minimum latency and chronodispersion of the F waves in the right peroneal nerve with normal persistence and increased chronodispersion of the F waves of the right median, ulnar and tibial nerves with normal persistence and minimum latency, which are typical of HNPP.
Discussion: HNPP is a recurrent peripheral mono-neuropathy with the onset of symptoms in the second to third decade of life. It manifests itself especially after prolonged work on a kneeling position, where painless focal sensory loss and muscle weakness in a single nerve are usually triggered by mechanical stress to the nerve – the peroneal at the fibular head, the ulnar at the elbow and the median at the wrist. Half patients recover from these episodes within a few days to months, but others have incomplete recovery and suffer from recurrent focal sensory and motor deficits. The EMG shows prolonged distal latency at the sites susceptible to mechanical stress. Genetic analysis of PMP22 gene showed the typical 1,4 MB deletion confirming diagnosis. Patient was referred to the genetic analysis.
Conclusions: Electrophysiological findings are helpful in establishing a HNPP diagnosis. Early diagnosis is important in order to facilitate appropriate genetic counseling and provide the appropriate care for these patients.

PP078
CLINIC GAIT ANALYSIS IN UPPER MOTOR NEURON SYNDROME IS ENOUGH? - A CASE REPORT

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Introduction: Spasticity occurs in post stroke patients, is one of the main problems in gait rehabilitation process, accounting for the loss of selective function, including comfort, speed and gait symmetry. The upper limb (UL) contribute to gait balance and speed.
Clinical case: MJJC, male, 56 years old, with left hemiparesis after a single stroke and unilateral fronto-temporo-parietal right, a year earlier. Moderate stroke by the National Institutes of Health Stroke Scale. Main clinics parameters evaluated and results: in 2 moments, pre botulin A toxin (BoNTA) in upper limb muscles and 5 weeks after: modified Ashworth scale (MAS) [4 – 0] ; 10 meters walk [0.66m/s - 0.83 m/s] , timed up and Go test (TUG) [15s -13s] ; instrumental parameters-analysis of spatial-temporal and symmetry of gait, comfortable and fast speeds analysis of hole body during gait, Disability assessment scale (DAS) for stroke [4-12], pain numeric scale during activity [5-0]. The evaluation of the gait was observational and conducted on regular ground by 10m straight, with usual footwear and comfortable speed, and measured by stopwatch, by medical doctor in department of MFR
Discussion: Treatment with BoNTA is safe and effective, producing positive functional outcomes. Recent studies have demonstrated improved gait speed after treatment of BoNTA in upper limb, like in this case. We proposed the control of spasticity of the UL with BoNTA housed in a global rehabilitation program. The gains in gait speed may not only due to improvement in spasticity but also to control the pain.
Conclusions: The results obtained in this case point to a potential contribution of BoNT for managing pain and spasticity. The improvement observed in the patient gait speed is encouraging and a stimulus to further gait studies, including laboratorial kinetics and kinematics analysis of hole body function.

PP079
GAIT ANALYSIS FOR THERAPEUTIC PLANNING IN BECKER MUSCULAR DYSTROPHY

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Introduction: Muscular Dystrophy is a genetic disease that causes progressive weakness and muscle atrophy. The most common types are Duchenne Muscular Dystrophy (DMD) and Becker Muscular Dystrophy (BMD). DMD and BMD are X-linked recessive allelic disorders, caused by mutations of the dystrophin gene. The absence of dystrophin or abnormal conformation allows Ca2+ entry leading to cellular death by necrosis. BMD is a generally milder and more variable form of dystrophinopathy, with an incidence of 1 in 18,518 male births. The diagnosis is based on a careful review of the clinical features and confirmed by additional investigations including muscle biopsy and / or genetic testing.
Methods: Case reports and literature reviews, about the gait pattern in BMD, and the evidence for improving gait, using orthotics. For this review, databases of Pubmed and Medline were researched from 2005 to 2015, finding 20 articles.
Case report: A 12-year-old male was diagnosed with BMD when he was 7-years-old, showing a hypertrophy on the rectus abdominis and calf muscles, and a waddling gait on tiptoes. A muscle biopsy showed a partial loss of dystrophin. Physical examination shows hypertrophy of both the calf muscles, Achilles tendon retraction and equinovarus feet bilaterally. Muscle strength G4 flexor and back feet. Gait analysis was performed to compare the gait pattern with and without AFO braces; was made a kinetic and kinematic analysis to assist in supporting the decision to perform surgery.
Conclusions: Rehabilitation is the main therapeutic weapon, not only by delaying musculoskeletal and postural consequences but also by prescribing orthosis, made from high technology to improve the quality of life of the patients. Gait analysis gives us quantitative information about the gait pattern and posture, which allow us to improve the decision of better orthosis and therapeutic planning. It also gives feedback to re-educate the movement.

PP080
A RELATIONSHIP BETWEEN VARIABILITY OF GAIT DYNAMICS BY DUAL-TASKING AND THE RISK OF FALLING IN PATIENTS WITH STROKE

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Introduction: Falling in patients with stroke is a common occurrence which leads to serious problems. Acceleration time-series data analysis were reported as a useful tool to detect the changes of gait dynamics by task-loads. However, it is unclear whether variability of gait dynamics caused by dual-tasking is related to the risk of falling in patients with stroke.
Purpose: The purpose of this study was to investigate the relationship between variability of gait dynamics caused by dual-tasking and the risk of falling in patients with stroke.
Methods: Participants were 14 patients with stroke who were capable to walk without any assistance. Participants were instructed to perform 10-meter walking test (10MWT) under single-task and dual-task condition. Trunk acceleration data were recorded using a tri-axial accelerometer during 10MWT. Using the peak antero-posterior accelerations of the non-paralyzed side at heel contact, ten gait cycles were extracted. Each gait cycle data was divided into seven 64-sample sections with 50% overlapped portions. Within each section, root mean square (RMS) and power spectrum entropy (PSEn) were calculated as parameters representing the magnitude of motion and smoothness of motion, respectively. Coefficient variations (CV) of both parameters were calculated. On the basis of Berg balance scale and Stops walking when talking test, participants were allocated to high-risk of falling group or low-risk of falling group. Data were analyzed by non-paired t-test.
Results: Significant differences regarding amount of change in CV of PSEn were found from pre-swing phase to initial contact of the paralyzed leg between the groups. There were no significant differences regarding amount of change in CV of RMS between the groups.
Discussion and conclusions: The results suggested that amount of change in CV of PSEn by dual-tasking is useful to identify the risk of falling in patients with stroke.

PP081
THE SPEED OF BACKWARD WALKING: A KINEMATIC STUDY

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Introduction: Backward/retro walking is an important modality in the rehabilitation of the musculoskeletal, neurological and cardiovascular systems.
Aim: The purpose of this study is to analyse the kinematics of backward walking (BW) at three different walking speeds.
Methods: In this study two healthy participants were recruited from the student body of the department of physiotherapy, University of the Witwatersrand. The trails were captured with 14 Optitrack cameras. The captured data were recorded with Amass software. These files were imported to Visual3D software to create a 3D anthropometric model with 6 degrees of freedom (DOF). The joint movements were analyzed to find joint angle, acceleration, velocity, force, moment and rotation during walking.
Results: The stride characteristics were found to vary significantly with respect to the BW speed. In a gait cycle, the notable standard deviations were observed in mean stance phase (63±3.4) and swing phase (34±4.8). The joint angles were significantly different in fast speed compared to slow speed ($p<0.005$), while joint velocity and acceleration showed a significant difference in BW.
Discussion and conclusions: During fast BW on ground, a knee flexion movement were more in swing phase and extension was high in foot flat to mid stance phase. Ankle joint movement at swing phase shows greater dorsiflexion at a slow speed, and relatively higher planter flexion movement at a fast speed during the stance phase. This study provides reference data for joint contributions over a wide range of BW speeds on ground and the kinematic parameters which emphasize the importance of backward walking.

PP082
GAIT TRAINER EFFECTIVENESS ON FUNCTIONAL INDEPENDENCE LEVEL IN THE REMOTE PERIOD

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Introduction - Gait training is one of the most important goal of rehabilitation for stroke patients, because limited walking reduces participation in community activities and return to work.
Purpose - To evaluate gait training outcomes in the remote period on functional independence level.
Methods - 66 stroke patients were randomly assigned to experimental and control group. All patients received 2 conventional physiotherapy procedures per day and one additional 20 minutes procedure: experimental group gait training with gait trainer, control group gait training with walker and manual assist. Gait parameters were collected measuring ability to walk maximal distance. Functional independence tests measures were taken at the beginning of the study, after 4 weeks and in the remote period 5 months after rehabilitation. Patients were tested with 3 functional independence tests: Barthel index, Functional Independence Measure and Trunk control tests.
Results - Patients in experimental group significantly improved in gait: for example patients could walk almost 3 times longer distance comparing with control group in the remote period. The results of Barthel index, Functional Independence Measure and Trunk control tests were significantly higher in experimental group after trial and in the remote period comparing with control group.
Discussion and conclusions - Research data agreed that robotics and gait trainers is very useful and easy to use in rehabilitation. But it's still lack of data about impact of gait trainers to patients functional independence level in remote period after rehabilitation process. The experimental group patients were more functional independent after rehabilitation and even after 5 months after rehabilitation than control group patients which had physiotherapy procedure using traditional compensatory measures.

PP083
TIBIOFEMORAL ADDUCTION ANGLE IS MODERATELY CORRELATED TO EXTERNAL KNEE ADDUCTION MOMENT DURING THE STANCE PHASE OF GAIT

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Introduction The knee adduction moment (KAM) is a varus torque of the knee during the stance phase of gait and is widely used as a surrogate marker of medial knee joint loads. An increased in knee adduction moment is associated with the occurrence and progression of knee osteoarthritis. Using 3-dimensional motion analysis allow us to assess the kinematic and kinetic variables of the tibiofemoral joint during walking and provides a way to set goals for training program.
Purpose The purpose of this study is to explore the KAM and kinematic performance of the hip and knee in the frontal plane during level walking.
Methods 10 healthy adults (mean age: 24.2±1.8) were recruited in this study. Twenty-two reflective markers were attached to the subjects according to the Plug-in gait manual, then the subjects underwent 3–dimensional gait analysis during barefoot walking at their self-selected comfortable speed. Kinematic and kinetic variables were recorded using the Vicon 8-camera motion analysis system and AMTI force plates. External KAM was estimated through inverse dynamics calculations from the ground reaction force and kinematic data.
Results The first peak KAM averaged 2.3±1.1 Nm/(body weight ·height) %, peak knee adduction averaged 11.8±5.2º and peak hip adduction averaged 15.4±9.9º. Positive correlation was found between the first KAM and peak knee adduction (r=0.6) and peak hip adduction during the early stance phase of gait.
Discussion and conclusions Frontal plane hip and knee kinematics are positively correlated to the first peak KAM during walking. Gait strategies to maintain the hip and knee in neutral alignment might help reducing the first peak KAM during the stance phase of gait.

PP084
COMPARISON OF DUAL TASK PERFORMANCE ON LEVEL GROUND AND STAIRCASE BETWEEN HEALTHY YOUNG AND OLDER ADULTS

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Ambulation on level ground and stairs are common functional mobility tasks. For older adults, there are some age-related changes that may increase fall risk. Previous studies indicated that older adults adopt some compensatory strategies to reach the higher demand of stair ambulation task. The purpose of this study was to investigate the effect of dual task paradigm on stair ambulation and level walking. We recruited twelve healthy young adults and eleven healthy older adults. Participants were asked to complete the level walking and stair ambulation tasks under both single and dual conditions. For the dual task condition, participants encountered three different task prioritizations. The backward-digit-span test was used as the cognitive task. Six-infra-red-camera-motion-capture-system was used to measure the kinematics of the lower extremities. Three-way ANOVA with repeated measures was used to analyze the joint angles of lower extremities and the result of trail making test between two groups. The significant level was set at p-value lesser than 0.05. A lesser peak left knee valgus angle was found during stair descent task. Furthermore, while ascending stairs, older adults demonstrated greater peak ankle plantar flexion angles than young adults; meanwhile, they required greater dynamic range of motion in left ankle dorsi-plantar flexion. During stair descent task, older adults performed greater peak left hip flexion angle. (all $p<0.05$) As for the spatiotemporal parameters, participants walked with a longer stride length and faster gait velocity under single task condition as compared to dual task which is only valid during level walking (all $p<0.05$). As for the elderly, some kinematic data changed due to the insufficient neuromuscular control and age-related decline in functional capacity. Therefore, physical therapist should not only pay attention to motions in the sagittal plane but also motions out of progression directions while evaluating the stair ambulation performance of elderly.

PP085
CLINICAL BIOMECHANICS IN CHARCOT-MARIE-TOOTH: CASE REPORT

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Introduction Patiets with Charcot Marie Tooth (CMT) disease offen have neurotrophic pressure ulcers in feet and falls secondary to gait disturbances.
Purpose We report a patient with CMT type I studied in the laboratory biomechanics. We analyzed the gait and plantar preassures to try to avoid falls and neurotrophic pressure ulcers.
Methods 39 year-old-male with progressive gait disturbance caused by CMT disease. It was performed a physical examination, a dynamic plantar preassure analysis (NOVEL system) and an kinematic and kinetic motion gait analysis (CODA system). The electromyographic (EMG) study shows active denervation and neurogenic pattern of dominance in severe left leg. Evoked potential amplitude <0.5.
Results The study of dynamic plantar pressure reveals a forefoot pressures close to 300 kPa with forefoot-rearfoot ratio of 1.20 kPa left foot; 1,81Kpa right foot. The gait analysis reports a left knee extensor moment without high pressure in the rear compartment (recurvatum even offset). With the results obtained, patient treatment consists in place full insoles, decreasing decreased hindfoot to more physiological values (1.04 kPa and 1.47 kPa left foot right foot). To decrease the risk of falling it was used a Rancho de los Amigos orthesis in the left foot and a foot-up orthesis in right foot.
Discussion and conclusions To systematize clinical biomechanics is essential to decide the types of enabling the most appropriate brace during the loss of walking ability in Charcot neuropathy. Alongside the dynamic plantar pressures to prevent neurotrophic ulcers and individualized design insoles for each patient more widespread use, it allows a rational and greater adherence to the requirements to provide maximum use without technical aids in these patients.

PP087
IMPACT OF INTENSIVE REHABILITATION ON BALANCE IN PATIENT WITH SPINOCEREBELLAR ATAXIA FOLLOWING A STEM-CELL THERAPY: A CASE REPORT

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Introduction: There is evidence to say that balance can be improved by rehabilitation and physical activity in spinocerebellar ataxia(SCA) . Stem-cell-based therapies represent new promise for clinical research in this disease.
Purpose: Our hypothesis was, that improvement in balance after stem cell therapy in SCA can be more important if it is follwed by intensive rehabilitation care.
Methods: We report a case of a 23 years old woman with SCA type 2 who recived intrathecal infusion of UCMSCs (human umbilical cord mesenchymal stem cells) and enrolled a 8 week intensive rehabilitaion care . Outcome measures were Berg's balance scale and a postural evaluation using the platform SATEL for the balance analysis associated with four conditions: static on stable plan open eyes (OE) then closed eyes (CE) and static on unstable plan OE then CE. The parameters under study were the averages of the total lengths, total surfaces, and the X and Y means.
Balance was trained by making the subject perform balance exercises standing over the Platform. balanceTraining was given for 30 mins/day, 5 days in a week,during 2 months.
Results: We observed a15 to 32 % decrease in values of total lenght and total surface (OE) in static balance on stable plan and 19% to 58 % on unstable plan. improvement were more important in lef/ right balance than in antero/posterior balance ,Berg's balance score improved from 42 to 47.no significant improvement were noticed at the (CE) conditions. this improvemets were maintened 9 month later in the same conditions.
Discussion: No studies have tried to asses the impact of intensive reahabilitation care and balance training following UCMSCs among subject with SCA on a postural platform.
Our studie report a better recovry of overall balance and especially in (OE) conditions either on stable and unstable plan.

PP088
STATIC AND DYNAMIC BALANCE ASSESSMENT IN PATIENTS WITH CEREBELLAR ATAXIA

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Introduction: The cerebellum plays an important role in the neural control of balance. Cerebellar lesions lead to ataxic symptoms of stance, gait and limbs. Studying cerebellar ataxia most researchers have measured static balance. Only few studies support the efficacy of rehabilitation with quantitative measures of static and dynamic balance.
Purpose: The aim of this study was to assess static and dynamic balance using the Biodex Balance System (BBS) in ataxic cerebellar patients.
Method: 15 cerebellar ataxic patients and 15 healthy subjects (49-82 years) were tested. 11 patients had a post-acute stroke lesion, 4 had a degenerative damage. Ataxia was graduated with SARA scale. Balance tests were performed with BBS before and after rehabilitation. 'Stability Index' (SI) was measured with open eyes (OE), closed eyes (CE), on firm or foam surface. 'Fall Risk' (RF) and 'Limits of Stability' (LOS) were measured on unstable surface. The ratio between SI with OE and CE was considered as index of 'visual preference' if > 2.
Results:Healthy subjects showed an age-related worsening of visual preference, RF and LOS. Before rehabilitation stroke patients had worse disability (FIM), more severe ataxia (SARA) and worse LOS (average 22 vs 28) than the others. Patients with a degenerative damage showed more visual preference. After rehabilitation stroke patients showed better improvement both in FIM and SARA scores and in dynamic tests. We found a moderate correlation between SARA and SI (r 0,50).
Discussion and conclusions: Evaluating static and dynamic balance is an important part of the rehabilitation protocol of an ataxic patient. Patients with degenerative cerebellar lesions showed compensatory strategy in postural control such as the visual preference. After rehabilitation we found better outcomes in stroke patients. BBS training is more useful in stroke patients because it stimulates learning of balance control, postural strategy and coordination of voluntary movements.

PP089
RELIABILITY OF TESTING CRANIOCERVICAL CONTROL USING A NEWLY-DEVICED AUTOMATIC PRESSURE FEEDBACK SYSTEM

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Introduction:The deep cervical flexors (DCF) are important in craniocervical control. Deficiencies of the DCF are associated with increased lordosis, neck pain, and headaches. Clinicians often use the craniocervical flexion test (CCFT) with a pressure biofeedback unit (PBU) to evaluate the control of DCF. However, the accuracy of the PBU is about ± 3 mm Hg and the testing level is of 2-mm Hg pressure increments from the baseline. This would results in error judgment of the craniocervical control. Therefore, our laboratory developed an automatic pressure feedback system for testing the craniocervical control. The system is constructed with a micromanager (arduino mega2560) to digitalize the voltage value from the pressure sensor (mpx5010) and provides with auditory feedbacks. Accuracy of the system is ± 1.3 mm Hg.
Purpose: The objective of this study was to determine inter-rater and intra-rater reliability of the system for testing the craniocervical control.
Methods: Ten healthy young adults (5 males and 5 females; mean age of 22 years; range, 19-27 years) participated in this study. For testing CCFT, subjects were positioned in supine lying with an inflatable pressure cuff of the automatic pressure feedback system placed under the neck. Each subjects performed CCFT consisting of 5 incremental stages (22, 24, 26, 28, and 30 mm Hg) guided through the auditory feedback of the system. The trial was scored separately by 2 raters. The same procedures were repeated after 2 days. Kappa coefficients (K) were calculated to estimate the intra-rater and inter-rater reliability.
Results: The between-day inter-rater and intra-rater reliability of the CCFT using the automatic pressure feedback system was perfect (K=1).
Discussion and conclusions: The newly-deviced automatic pressure feedback system is highly accurate and showed perfect inter-rater and intra-rater reliability for testing the craniocervical control.

PP090

BOBATH THERAPY VERSUS REPETITIVE TASK - THE EFFECT IN THE MOBILITY, LIMITS OF STABILITY AND STATIC BALANCE

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Introduction: The Bobath Concept is based on neurophysiological and motor learning theories, which aims at detecting and analyzing problems within functional activities, such as the task sit-to-stand however, its efficacy is controversial. The issue is, does the facilitation of a task or its repetition interfere with a patient's improvement.
Purpose: Compare the effect of the Bobath Concept therapy with a Repetitive Task in the mobility, limits of stability and static balance.
Methods: 21 female and male patients, aged between 54 and 84, were randomized into two groups: Bobath Concept (n=10) and Repetitive Task (n=11). Throughout 6 weeks, 4-times/week during 30 minutes, the task sit-to-stand was facilitated based on the Bobath Concept, while the other group repeated the task without facilitation (Repetitive Task). The mobility, limits of stability and static balance were assessed through Timed Up & Go (TUG), Multi-Directional Reach Test (MDRT) and Single Leg Stance (SLS), before and after intervention. A Multiple Linear Regression was executed and adjusted to age, body mass index, baseline values and number of repetitions; â and confidence intervals were presented. The significance level was $p<0,05$.
Results: There were no significant differences between the two groups, relatively to TUG â=1,444 (-2,021; 4,909), MDRT to anterior â=0,106 (-1,656; 1,868), to the right â=1,659 (-0,375; 3,693), and to the left â=-0.503 (-2,506; 1,499) and SLS â=1,583 (-1,123; 4,288).
Discussion and conclusions: An intervention program of 30 minutes during 6 weeks based on the Bobath Concept did not show more efficacy than a Repetitive Task in the mobility, limits of stability and static balance.

PP091
INSTRUMENTAL EVALUATION OF THE POSTURAL PROFILE DURING HEMIPLEGIA

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Introduction: Instrumental evaluation was developed since few years. It allows an objective investigation of the postural profile of patients in order to detect postural abnormalities and propose specific rehabilitation. Chronic neurologic affections such as hemiplegia can lead to significant impairment of postural performance, and may be generating progressive loss of autonomy and high risk of falling.
Purpose: The objective of the study is to study balance disorders in patients with hemiplegia in order to organize postural rehabilitation.
Methods: Prospective study conducted in the department of physical and rehabilitation medicine in the Military Tunis hospital during septemeber 2015, concerning walking hemiplegic Patients. All the subjects had clinical and instrumental evaluation with static platform on two conditions: open eyes then closed eyes. The main postural parameters evaluated were the surface of the ellipse of confidence (S), the average position of the center of pressure following laterolateral and anteroposterior axis (x), the quotient of Romberg (QRBG), and the variance of the average speed of movement of center of pressure.
Results: 10 patients were included in the study, 13 men and 8 women. The mean age was 63 years old (51-73 years). Patients were divided in two equal groups according to the side of hemiplegia. The main disturbed parameters were the surface of ellipse of confidence who was enlarged in almost of the patients and the average position of the center of pressure following laterolateral axis (x).
Discussion and conclusions: Alteration of stabilometric parameters may be explained by the nature of the disease witch alter postural control mechanisms. Hemiplegic condition is often characterized by a lateral deviation of the center of pressure to the healthy side. Postural evaluation should be followed by instrumental rehabilitation of the posture in order to improve balance disorders.

PP092
CARDIAC REHABILITATION: OUR FIRST STEPS

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Introduction: Cardiovascular diseases (CVD) are the leading cause of death in Europe, as well as in Portugal. Cardiac Rehabilitation Programs (CRP) play a significant role in the reduction of cardiovascular mortality (26-36%) and in total morbidity (13-26%) in patients with coronary disease, however less than half of eligible patients participate in CRP in most European countries. In Portugal, only 10% of patients with Post-acute Coronary Syndrome (ACS) participate in CRP. Currently, there are only 22 active centers which offer cardiac rehabilitation (12 public). The Hospital Garcia de Orta (HGO) began offering such services during the second semester of 2014, one of the most recent in Portugal.
Purpose: To characterize the patients which participated in the first year of HGO's cardiac reconditioning program in terms of key demographic variables and the prevalence of common cardiovascular risk factors.
Methods; A transversal, descriptive study of patients with ischemic heart disease who were admitted to the CRP between September 2014 and October 2015. The following parameters were analyzed: age, gender, admission diagnosis, lipid profile, blood pressure, diabetes, body mass index, smoking and family history of CVD.
Results: Twenty-two patients were admitted. The mean age was 52,5 [36-73] years old, predominantly male (77%), all were admitted after ACS. The prevalence of total cholesterol ≥175mg/dL was 50%, LDL ≥100mg/dL 73%, HDL ≤45mg/dL 73%, triglycerides ≥150mg/dL 32%, hypertension 73%, diabetes 18%, 68% overweight, 32% obese, 55% smokers, 14% ex-smokers, 68% presented with a family history of CVD.
Discussion and Conclusion: During our first year of activity only 22 patients were admitted. Notwithstanding, a high prevalence of cardiovascular risk factors were observed, highlighting the importance of early and easy access to CRP as they include multifaceted strategies aimed at reducing modifiable risk factors for CVD.

PP093
CARDIAC REHABILITATION PROGRAMME IN CARDIAC PATIENTS OVER 75 YEARS

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Introduction: Benefits of cardiac rehabilitation are well established in coronary heart and heart failure diseases. The effects in patients over 75 years are less known.
Purpose: Evaluation at 6 months of a Cardiac rehabilitation programme in two groups of patients, under and over 75 years.
Methods: One thousand six hundred seventy and two patients were included in the Cardiac Rehabilitation department in Gregorio Marañón Hospital in Madrid between 2009 and 2014. They attended the Cardiac Rehabilitation programme and were examined at six months. Patients were divided into two groups: group 1, n=1037 (<75 years), group 2, n=635 (>75 years), 80% men and 20% women. We analysed the exercise capacity (exercise stress testing as ergometry) and bio-clinical data.
Results: Exercise capacity improved respectively by 30% and 15% (P<0.005). At 3 months, HDL cholesterol increased in the two groups but body mass index (BMI) was unchanged.
Conclusions: The impact of cardiac rehabilitation is also very important in people over 75 years.

PP094
POLYURIA AFTER SPINAL CORD INJURY, A DIABETIS INSIPIDUS STATE?

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Introduction: Spinal cord injured (SCI) patients are at increased risk of cardio-vascular and pulmonary dysfunction including postural hypotension, obstructive sleep apnoea etc. Although there are reports of polyuria and nocturia among SCI individuals, especially so among those who have sustained high cervical cord injury, there is no conclusive causal explanation. Further investigations are currently considered unwarranted as the patients are asymptomatic. However postural hypotension, a common problem among these patients, maybe further potentiated by polyuria and has a negative impact on effective rehabilitation.
Purpose: We report a case series of SCI patients with polyuria and/or nocturia who had significant postural hypotension and possible explanations.
Methods: We looked at clinical data including level of spinal injury, associated symptoms, changes in postural blood pressure, intake-output charts as well as laboratory data of five consecutive patients admitted to our rehabilitation centre.
Results: All tetraplegic SCI patients with neurological level of injury ranging from C2 to C5 had significant nocturia which is unexplained by normal baseline laboratory investigations. Further investigations were not considered as they were otherwise asymptomatic. However, four of them were noted to have significant postural hypotension that hindered effective rehabilitation on some days. There was an incidental diagnosis of significant OSA in two cases while other patients had neither respiratory symptoms nor any nocturnal hypoxemia and hence sleep study was not indicated. Polyuria still remains unexplained for them.
Discussion and conclusions: Polyuria maybe due to changes in anti-diuretic hormone release related to postural hypotension or OSA, leading to a relative diabetis insipidus state and the relative water deficit may further potentiate postural hypotension. Further studies looking at possible mechanisms of polyuria in these patients are needed. Therapeutic targets designed to block these mechanisms may help in amelioration of polyuria and benefit postural hypotension leading to improved rehabilitation outcome in these patients

PP095
CORTICOSTEROID INJECTION IN THE TREATMENT OF SKIN BURN KELOIDS

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A keloid is an abnormal proliferation of scar tissue that forms at the site of a cutaneous injury, like a burn lesion. There are multiple studies that report the benefit of corticosteroid injections in the management of this pathology. We present a clinical case of a 29 year old woman with a 2nd degree skin burn of the neck, limbs and thigh caused by an accident with boiling oil. After stabilization during the acute phase, with multiple debridement interventions, she was dismissed without surgery need. She started an ambulatory rehabilitation program 3 times a week with occupational therapy 2 times a week. However, four months after the initial admission she had significant keloid lesions on the burnt areas that limited her articular range of motion. She started a steroid injection program on both hands and right forearm keloids every 15 days. Since the first treatment the keloids improved, becoming smaller and less pigmented, with marked improvements on the mobility and function of both hands. In accordance with previous studies, this case shows that corticosteroid injections are an effective adjunct treatment to keloid lesions with a marked impact on the patient's life quality.

PP096

SYNTHETIC CANNABINOID ABUSE MAY LEAD TO PHYSICAL AND PSYCHOLOGICAL DISORDERS. THIS SUBSTANCE HAS DISSEMINATED RAPIDLY IN RECENT YEARS AND THE LITERATURE ABOUT ITS BAD CONSEQUENCES IS RATHER SPARSE. IN THIS STUDY, WE AIMED TO INTRODUCE A PATIENT WHO PRESENT WITH SENSORY POLYNEUROPATHY AFTER USING SYNTHETIC CANNABINOID

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Introduction:Synthetic cannabinoid abuse may lead to physical and psychological disorders. This substance has disseminated rapidly in recent years and the literature about its bad consequences is rather sparse. In this study, we aimed to introduce a patient who present with sensory polyneuropathy after using synthetic cannabinoid.

Case:25-year-old male patient with multiple admissions to the psychiatric ward because of Bonzai addiction in our institution for acute psychotic episodes due to the use monitored and substance, general condition to the emergency room on confusion, presented with gait disturbance complaint. Following the Bonzai intake by inhalation of complaints had begun within hours. Has been determined depending on the use of drugs in persons as a result of neurological consultation held toxic neuropathy EMG evaluation engine have been reported predominantly sensorimotor polyneuropathy. People cannabis the last 10 years, exctasy, Rivotril, substances such as Bali is used intensively, the last 3-4 years that the bonzai and Jamaica who are using these substances every day five or six times in the form of wrapping cigarettes or bong. In the neurological examination was conscious, cooperative, oriented signs of cranial nerve examination was within normal limits. Routine blood count, biochemical tests, liver and kidney function tests, Brain CT, brain MR angiography was normal. Vasculitis markers (ANA, ds-DNA and p-ANCA, c-ANCA, anticardiolipin IgG and IgM, homocysteine, antiphospholipid IgM and IgG, BUT, lupus anticoagulant negative, protein C, protein S, and antithrombin III were normal. Factor V Leiden mutation was not detected. Bilateral hip flexion,extension, abduction, adduction 2/5, knee and foot- ankle flexion, extension of the internal rotation was 2/5.

Conclusıons:In this case, the output timing of symptoms and signs of motor sensory polyneuropathy bonsai given is considered to be due to intensive use. Looking at the literature relevant notification in this regard has not been demonstrated.

PP097
EXERCISE PROTOCOLS BEFORE OR AFTER BARIATRIC SURGERY IN OBESE PATIENTS: LITERATURE REVIEW OF INTERVENTION STUDIES

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Introduction: Bariatric surgery is described as the most effective treatment for severe or morbid obesity. The contribution of physical activity in addition to bariatric surgery remains uncertain.
Purpose: The objective of this study was to systematically review the literature on intervention studies that evaluated the benefits of exercise protocol in obese patients, before or after bariatric surgery.
Methods: A systematic review of the literature was done from Keyword Mesh, in the Medline database from 1966 to November 2015, combined with the reading of references of selected articles. Only the English and French studies were selected. Only patients receiving their first bariatric surgery were included.
Results: This review includes nine intervention studies on exercise protocols, with three preoperatively (including one uncontrolled) and six postoperatively (including one non-randomized).The results of preoperative studies are insufficient to evaluate the benefits of exercise protocols on weight loss outcomes and surgical safety. Postoperatively, there is a significant effect on cardiac capacity, functional capacity, muscle strength, insulin sensivity and quality of life in particular. Weight loss was found significantly only in one of the six studies.
Discussion and conclusions: Exercise protocols seems broadly positive but an insufficient evidence remains in particular concerning the effect on weight loss, preservation on lean body mass and long-term duration.

PP098
NEUROLOGICAL COMPLICATIONS AFTER BARIATRIC SURGERY:A CLINICAL CASE

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Introduction: Bariatric surgery is indicated for the treatment of obesity in patients with an IMC>40 or an IMC>35 and co-morbidities related to the disease. In the last few years, there has been an increase in the number of procedures performed. As a consequence, a rise in the number of neurological complications post-bariatric surgery is expected.
Purpose: to review literature on neurological complications after bariatric surgery.
Methods: we searched for neuropathy and bariatric surgery in Pubmed-MEDLINE and Scielo.
Results: 28 year-old female patient with a medical record of depression and obesity. She was submitted to bypass gastric surgery. Three months after surgery the patient developed vomiting. She was admitted for diagnostic studies, which were normal. The vomiting resolved and she was discharged . The patient then noticed progressive tetraparesis. At admission to hospital, examination revealed predominantly distal tetraparesis, nystagmus, ataxia, "glove and sock" type of hypoesthesia and abolished reflexes. She was immediately supplemented with tiamine with resolution of nystagmus and ataxia on the following day. Analitical studies revealed folate and vitamine D deficiency, and she was supplemented with those as well. Electromyography confirmed a sensori-motor polyneuropathy with axonal damage of the lower and upper limbs. She began rehabilitation. At check-out from the hospital, two months after admission, there was a slight improvement of neurological deficits and an increase in autonomy for daily living activities.
Discussion and conclusions: Vitamin deficiencies after bariatric surgery may result in neurological complications, sensory-motor polyneuropathy being an example. It usually is associated with multiple vitamin deficiencies and manifests predominantly as a distal paresis and hypoesthesia. Recovery can be long and may not respond to vitamin supplementation. The present case underlines the importance of vitamin supplementation and monitoring after bariatric surgery. It also underscores the importance of rehabilitation in improving neurological deficits and autonomy for daily living.

PP099
DESIGN OF A PRESSURE DATA MONITORING SYSTEM FOR IMPROVING THE TREATMENT EFFECT OF PRESSURE THERAPY ON HYPERTROPHIC BURN SCAR

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Introduction: It's well known that pathologic burn scar will bring many sequelae to patients. Of the rehabilitative treatment methods of post-burn, pressure therapy is widely used in clinic. The key point for pressure therapy is to apply proper pressure, which should not be too strong or too weak. Currently, the value of applied pressure is mainly based on doctors' own subjective experience, which lack objective evaluation criteria and measurement method. Therefore, an objective and accurate measurment tool is urgently needed to monitor the pressure value.
Purpose: Develop a pressure data monitoring device to help the doctor get objectvie pressure value during the pressure therapy, which will help the doctor properly adjust the pressure bandage.
Methods: The pressure data monitoring device consists of two parts: a pressure sensor module and a signal processing module. The pressure sensor module mainly consists of a flexible pressure sensor and a wireless communication module; The signal processing consists of a microcontroller, a wireless communication module and a display screen. The flexible sensor which is placed between the bandage and patient's burn surface can detect the pressure value, send the data to signal processing module by wireless method and the pressure values will be displayed on screen.
Results: Pressure measurement range of the device is 0-100 mmHg, and its measurement accuracy is 1 mmHg. In addtion, it owns advantages of small size, easy operation for doctors and alarm function when the pressure is too high or too low. What's more, the results of clinical pre-experiment were satisfactory.
Discussion and conclusions: The pressure monitoring device was successfully developed and can be widely used in pressure therapy on hypertrophic burn scar to make the pressure therapy more scientific and standardized, which will have important economic and social values and clinical application prospect.

PP100
ASSESSMENT OF QUALITY OF LIFE AND FUNCTIONAL CAPACITY IN CARDIOVASCULAR PATIENTS BEFORE SURGERY

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Introduction: Assessment of Quality of life of patients with cardiovascular disease has a very important role in monitoring the success of therapeutic procedures. It is estimated that physical, emotional and social functioning of patients, where the patient is placed in the center, not his disease.
Purpose: The aims of this study were to assess the quality of life related to health in patients before the planned cardiac surgery, then to estimate functional capacity of these patients. The last objective was to evaluate the correlation between the quality of life- physical functioning, and the distance during the 6 minute walk test (6MWT).
Methods: This study included 30 patients who were planned for cardiac surgery (bypass or valve replacement) of average age of 63.33 (41-75) years. All patients were included in the program of preoperative education as part of early rehabilitation program. Quality of life was assessed by using the Short Form (36) Health Survey (SF-36) the day before surgery. Functional capacity was estimated using 6MWT the same day, after completing SF-36. In the statistical analysis we used Pearson's correlation coefficient.
Results: The average results of SF-36 by subscale: physical functioning 53.17±26.67, role limitations due to physical health 15.83±30.43, role limitations due to emotional problems 39.98±33.22, energy/ fatigue 46.17±22.88, emotional well being 64.27±14.59, social functioning 60.83±25.37, pain 51.08±24.94 and general health 48.83±17. The mean distance of 6MWT was 241.67±35.44 m. There was strong positive statistical correlation between the SF-36-physical functioning and 6MWT (Pearson's correlation coefficient= 0.823, $p< 0.001$).
Discussion and conclusions: The functional status correlates with SF36-physical functioning in patients before cardiac surgery. Results of the SF-36 suggest that these patients experienced the most limit due to physical health. Team work and medical care should be focus on better control of those factors.

PP101
A STUDY OF KOREAN TRANSLATION AND VALIDATION OF THE WHOQOL-DIS MODULE

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Objectives: In this study, we translated and cross-culturally adapted the World Health Organization Quality of Life-disability (WHOQOL-DIS) module into Korean, and then tested its reliability and validity with Korean spinal cord injury (SCI) and stroke patients.
Methods:The WHOQOL-DIS module was translated into Korean following the WHO translation methodology, which consisted of such steps as forward translation, reconciliation, back translation, cognitive debriefing, and the final version. The cognitive debriefing was administered to 10 people with disabilities (5 SCI and 5 Stroke). Additionally, the Korean version was evaluated for its reliability and validity in 85 SCI (n =58) and stroke(n=27) patients. Concurrent validity was assessed in relation to WHOQOL-BREF scores. Internal consistency coefficients were analyzed by the cronbach's á of the WHOQOL-BREF and the DIS module. Also, test-retest reliability was obtained with 7~ 10days interval for 30 of the 85 participants who agreed to complete the questionnaire twice and the obtained data were analyzed by the Pearson's correlation coefficients. The Pearson's correlation was also used to examine construct validity; that was to see if there was significant correlation within each sub-domain set.
Results: The result of cognitive debriefing indicated that the Korean SCI and Stroke patients understood the Korean version pretty well. In validating the WHOQOL-DIS, our results showed high internal consistency with the WHOQOL-BREF, with Cronbach's á coefficients ranging from 0.603 to 0.875. Moreover, their Pearson's correlation was significant in the three sub-domains of DIS module (r =0.759).
Conclusions: This reliable and valid instrument can now be used to properly evaluate the quality of life of Korean people with disabilities. Further studies with a variety of other disabilities are required to obtain additional evidence of validity and reliability.

PP102
DEPRESSION AND QUALITY OF LIFE IN CHEMO DIALYSIS AND PERITONEAL DIALYSIS PATIENTS

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Introduction: Quality of life of patients on chemo dialysis and peritoneal dialysis has been compromised. These patients are more prone to depressive mood.
Purpose: We aimed to estimate quality of life and degree of depression in patients on chemo dialysis and peritoneal dialysis. We investigate the association between degree of depression and emotional well being.
Methods: In our study, we examined 29 patients (16 male, 13 female) with chronic renal insufficiency, who were on chemo dialysis (27) or on peritoneal dialysis (2), average ages of 55.79±9.99 (32-72). The average number of years of dialysis was 3.57±2.99. We estimated the quality of life by Short Form (36) Health Survey (SF-36). The degree of depression assessed using the Hamilton Rating Scale for Depression (HRSD). Correlation between the degree of depression and emotional well being analyzed using Spearman's rank correlation test.
Results: The average value of HRSD was 13.03± 6.96, and the distribution of patients by groups: no depression 6, mild depression 10, moderate severe 7, severe 2 and very severe depression 4. The average results of SF-36 by subscale: physical functioning 38.79±24.77, role limitations due to physical health 12.07± 21.77, role limitations due to emotional problems 33.32± 39.84, energy/fatigue 43.79±20.38, emotional well being 57.38±20.06, social functioning 55.60± 22.56, pain 55.43±30.59 and general health 32.93±14.73. There was medium moderate negative correlation between HRSD and SF-36- emotional well being (Spearman's rank correlation coefficient= -0.445, p value= 0.016).
Discussion and conclusions: This study showed that the patiens with chronic renal insufficiency tend to have mild and moderate severe depression. The degree of depression correlates with SF36- emotional well being.

PP103
OUTCOME MEASURES IN STROKE'S REHABILITATION UNIT

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Introduction: Stroke rehabilitation is an important part of recovery after stroke because regains patient's independence and improve your quality of life.
Purpose: To quantify recovery after rehabilitation therapy in survivors of intracerebral hemorrhage (IHC) compared with cerebral infarction.
Methods: Setting in Neurological Rehabilitation Unit in A Coruña (Spain). We retrospectively identified all persons with a diagnosis of stroke who were consecutively admitted to Hospital Marítimo de Oza between January 1, 2010 and December 31, 2014. Total of 365 cases (95% confidence leve, 80% statistical power, ±3,5 precision) met the inclusion criteria: patients who understood our language, first episode of stroke, injury confirmed radiological tests and patients who have signed informed consent. Functional status was measured using the FIM instrument (motor, cognitive and total score) recorded at admission and discharge. Recovery was quantified by Ä FIM. The efficiency was defined as the ratio between the increase of the FIM scale and number of days of hospitalization. Comparisons for quantitative variables were made using the Student's t-test or Mann–Whitney test, depending on which was considered appropriate, after checking for normality using the Kolmogorov–Smirnov test. Qualitative variables associations were analyzed using Pearson's ÷2 test.
Results: At admission, FIM (cognitive and total score) in patients with infarction was higher than in IHC (19,6 vs. 16,8 p=0.016) and (54,3 vs. 48,4 p=0.044). The patients with ICH had longer rehabilitation length of stay than in patients with cerebral infarction (91,4 vs. 73,3 p=0.004). For Ä FIM and efficiency of FIM, there are no significant differences between groups (30,8 vs. 31,2 p=0.856) and (0,6 vs. 0,7 p=0.256).
Discussion and conclusions: When comparing the efficiency by etiology, is observed that the ischemic group is more efficient because it improves more in less time, with no significant differences.

PP104
ADMISSION BARTHEL INDEX IS INDICATIVE FOR SAFELY RETURN TO COMMUNITY IN STROKE PATIENTS

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Introduction: Stroke patients are dependent for the Activities of Daily Living which complicates their safe return to everyday life.
Purpose of the study: to examine whether the Modified Barthel index score of admission is indicative of the functional improvement of stroke patients after discharge.
Methods: 36 patients were selected: 20 with right hemiplegia (m=16, w=4) and 16 patients with left hemiplegia (m=11, w=5). The patients were evaluated by the Modified Barthel Index at the time of admission and discharge, and divided in 2 groups: A group Barthel index 1 to 24 with 9 patients (5 patients with right hemiplegia and 4 with left hemiplegia), and B group Barthel index 50 to 74 with 27 patients (15 patients with left hemiplegia and 12 with left hemiplegia).
Results: At the time of discharge, patient of A group did not present any change, while patients of B group who were moderately depended, improved their Barthel index from 91 to 100.
Discussion: Initial Barthel index score seems to be indicative of the functional improvement of patients.
Conclusions: Patients with low Barthel index scores at the time of admission did not present with any significant improvement of their functional state as well as safely integration into society unlike those with moderate scores.

PP105
HAND GRIP STRENGTH AS AN OUTCOME MEASURE IN HAND REHABILITATION

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Purpose: To evaluate hand grip strength as an outcome measure in the hand rehabilitation in outpatient setting.
Methods: Fifty adults participated in the prospective observational study from January until June 2015. Twenty-four had hand trauma, 7 had hand osteoarthritis, rheumatoid arthritis, or hemiplegia, 10 had operative decompression due to carpal tunnel syndrome, and 9 had hand tenosynovitis. Hand grip strength was assed prior and after hand rehabilitation cycles using a mechanical dynamometer. During each assessment 3 measurements were taken and average value was recorded. Healthy hand was used as a control. Patients underwent rehabilitation cycles that included kinesitherapy, electrotherapeutic procedures, cryotherapy, therapeutic ultrasound, and magnetic field treatment. Each rehabilitation cycle lasted for 10 days. Results are presented as median and interquartile range. Chi-squared and Kruskal-Wallis test were used to test differences between disease groups, and Wilcoxon Signed Ranks test was used to analyze outcome differences.
Results: Median age was 53 (42-64) years, and 31 were females. Left hand was affected in 56%. There were no statistical differences between disease groups in age, gender, or hand grip strength of unaffected hand. A significant increase in hand grips strength of affected hand was observed after rehabilitation cycles for all disease groups, which was highest for hand trauma patients, 13 (4-19) vs. 20 (10-30), $p<0.001$, and lowest for osteoarthritis/rheumatoid arthritis/hemiplegia group, 18 (12-22) vs. 20 (10-30), $p=0.41$.
Conclusions: Hand grip strength appears as a simple and effective outcome measure, which can assist in the assessment of effectiveness of selected hand rehabilitation procedures.

PP106
FOLLOWING THE MEDITERRANEAN DIET

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Introduction: Observational studies have shown that following a Mediterranean diet was associated with a reduced risk of death from heart disease and cancer. Cardiovascular diseases (CVD) are major health problem worldwide. Also it causes about 55% of death in Latvia. Rational nutrition is one of the primary prevention factors.
Purpose: The aim of this study was to clarify the adherence of Mediterranean diet in general population of Latvia.
Methods: In the study were involved 209 participants in the range 30 to 65 age without previously diagnosed CVD. Dietary behaviour was determined using Predimed administered food questionnaire. In addition anthropometric measures and serum biochemical indicators were assessed. Data statistical analysis were done in programme SPSS (20.0 version).
Results: In a study participated 209 respondents, 66 % (n=138) were women and 34% (n=71) men. The mean age of participants was 43,8 (SD 7,7). Results showed that 34,7% (n= 69) had normal body mass index, 34,7% (n= 69) were overweight and 30,6% (n=61) had obesity. The median total cholesterol level was 5,4 mmol/l (1,5;8,4). Only 12,4% (n=26) participants were adhered to Mediterranean diet.
Discussion and conclusions: Small part of population follow the Mediterranean diet. There is lack of knowledge about basic nutrition principles as well as there is Latvian and Mediterranean regional differences of dietary habits. Therefore it is important to adapt those dietary habits in the Nordic countries. In conclusion it would be valuable to create Predimed similar nutritional assessment questionnaire for prevention cardiovascular disease in Latvia, adjusting the Mediterranean diet traditional Latvian products with similar nutritional value.

PP107
STROKE OUTCOMES IN SERBIAN PATIENTS MEASURED BY MODIFIED RANKIN SCORE AND BARTHEL INDEX

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Introduction: Stroke is one of leading causes of morbidity, disability and mortality in Serbian population and investigation of functional outcomes are very important and could be used to select specific management strategies and set realistic therapeutic goals.
Purpose and Method: The objective of our study was to show functional outcome measures in acute stroke patients who undergone rehabilitation treatment at The Institute of Physical Medicine and Rehabilitation, Belgrade, organization unit "Selters" Mladenovac.
Results: We obtained data from 59 patients in order of appearance and treated in 2014., respect of their gender, age, type of stroke, side and severity of stroke, days from the stoke to the admission at rehabilitation unit, length of the rehabilitation treatment and comorbidity. All patients received standard rehabilitation treatment and 25 out of 59 patients had functional electrical stimulation in addition. At the baseline and at the end of the rehabilitation we measured Barthel Index (BI) and modified Rankin Score (mRS). Our data show that there was no significant difference between the baseline measurements except that women has more comorbidities then man (t-2.332, p‹0 .023), and the two most common comorbidity in both sexes were hypertension and diabetes mellitus. The higher functional improvement was gained in hemiparetic patients then in hemiplegic in both Barthel Index (t - 3.419, p‹0 .001) and mRS (t-2.735, p ‹0 .008) at the end of rehabilitation program. The group of patients who received electrical stimulation had better functional outcomes BI (t-3.676, p ‹0 .001), and mRS (t-3.087, p‹ 0.003).
Discusions and conclusions: Expected better functional result was obtained with hemiparetic and those patients who were longer rehabilitation, which suggests in conclusion the need for early and prolonged rehabilitation for hemiplegic (also hemiparetic) patients and inclusion of electrical therapy whenever possible, unless there is a contraindication.

PP108
ADAPTATION AND VALIDATION OF THE IMPACT ON PARTICIPATION AND AUTONOMY QUESTIONNAIRE FOR USE IN TURKEY

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Introduction: Participation, defined as 'the involvement in a life situation' is an important outcome in rehabilitation. Impact on Participation and Autonomy Questionnaire (IPA) is one of the commonly used instruments that assess participation. It includes IPA-1 as 32 items in 5 subscales giving a participation score, as well as IPA-2 as 9 items giving a problem score.
Purpose: The aim of this study was to adapt the IPA into Turkish and test its reliability and validity.
Methods: IPA was translated to Turkish by forward and backward translation method, followed by cognitive debriefing interviews. For the reliability and validity study, 192 patients with neurological (n=103) and rheumatic diseases (n=89) who were in the follow-up of the Department of Physical Medicine and Rehabilitation, Medical Faculty of Ankara University, were assessed. Reliability was tested by internal consistency, person separation index (PSI) and test-retest reliability. Internal construct validity was tested by Rasch analysis and external construct validity by correlations with Modified Barthel Index, London Handicap Scale and Nottingham Health Profile.
Results: Cognitive debriefing results showed that IPA was clear, relevant and comprehensive. Internal consistency of the IPA subscales was satisfactory (Cronbach-Alpha of 0.72-0.91, PSI of 0.73-0.83). Test-retest reliability was good except the "family role" subscale. Rasch analysis supported the internal construct validity of the scale. Differential Item Functioning was found in some items for diagnosis (neurological vs rheumatological) however this was accommodated within the Rasch model. Expected correlations were found between the IPA subscales and the comparator instruments.
Discussion and conclusions: Adaptation of the IPA to Turkish has been successful.Turkish version of the scale has been found to be reliable and valid for neurological and rheumatic conditions and thus can be used for the assessment of participation both for clinical and research purposes.

PP109
THE RELATIONSHIP BETWEEN WRIST JOINT POSITION SENSE, HAND GRIP STRENGTH AND ANTHROPOMETRIC VARIABLES IN HEALTHY SUBJECTS

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Introduction: Hand grip strength and joint position sense (proprioception) are standard outcome parameters used for hand rehabilitation programs. They may vary according to certain anthropometric characteristics.
Purpose: To determine the relationship between grip strength, joint position sense (proprioception) at wrists and hand anthropometric characteristics in healthy subjects.
Methods: Fifty students (37 female) from Haliç University, School of Health Sciences between ages of 18-30 years participated in this study. The data collection followed the recommendations of the American Society of Hand Therapists (ASHT). After the documentation of the demographic characteristics of the participants, anthropometric measures (length and circumference of hand and forearm in centimeters) were conducted by using tape measure. Hand grip strength was measured by dynamometer (kg), pinch strength (tip, key, palmar) were measured by the pinchmeter (kg). Wrist joint position sense was assessed with a goniometer. Target joint angle was 30° for flexion and extension, 10°for radial and ulnar deviation. All measures were conducted for both hands.
Results: A significant positive association was found between anthropometric measurements and grip strength ($p<0.05$). There was no association between anthropometric measurements and wrist joint position sense ($p>0.05$). A positive association was found between flexion wrist position sense and palmar pinch strength ($p<0.05$). A negative association was found between flexion wrist position sense and key pinch strength ($p<0.05$). A negative association was found between extension wrist position sense and key pinch strength ($p<0.05$).
Discussion and conclusions: It is concluded that hand grip strength is associated with anthropometric measurements and wrist position sense is associated with pinch strength. Anthropometric measurements can provide information about the muscle strength along with other assessment methods in the regulation of physiotherapy and rehabilitation programs.

PP110
INTERVIEW FIM (FUNCTIONAL INDEPENDENCE MEASUREMENT) SCORE, AN EASIER ALTERNATIVE FUNCTIONAL SELF-ASSESSMENT TO MULTI-DISCIPLINARY FIM SCORE

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Introduction: FIM score is a validated, performance based objective assessment of functional status. Though widely used in rehabilitation centres, it may not be feasible for all patients. Previous studies shows positive as well as negative agreements on self-reported FIM results in spinal cord injured and amputees.
Purpose: To test the validity of self-reported FIM-motor score in post-stroke patients.
Methods: A prospective, double blinded comparative study of patient self-assessment score against multi-disciplinary assessment using the standard FIM algorithm, in post stroke patients. Included all patients admitted to our rehabilitation centre with a diagnosis of stroke who met study criteria (N = 47). 33 patients were included in the analysis as the rest didn't have a FIM assessment by the team.
Results: The study showed substantial agreement for total FIM motor score between the team and that self-reported by patient with intra-class correlation (ICC) being 0.651 (95% CI: 0.404-0.811). The individual item of motor scores also showed moderate and substantial agreement (ICC ranging from 0.431 to 0.618), except that for eating, grooming, bathing and dressing of lower body (ICC were <0.40).
Discussion: There was no FIM assessment for 14 patients (30%) a common occurrence due to time constraints, highlighting the need for alternative assessment tools. The discrepancy in some scores could be due to the unawareness of limitations while inpatiet, embarrassment with reporting of some activities. This concurs with results from previous studies. Post discharge assessment may provide a better assessment. As our study included stroke patients who had completed rehabilitation, usefulness is limited to assess functional recovery. The results may not be valid in other populations, such as those with cognitive or communication deficits
Conclusions: Patients' self administered FIM motor rating maybe a valid measure of functional ability and may be useful in situations where multi-disciplinary FIM is difficult.

PP111
HEALTH-RELATED QUALITY OF LIFE AMONG FACIAL SURGERY PATIENTS

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Introduction Most patients after face or skull injury and following surgery are associated with changes in the appearance of face in total or oral dysfunction. This study aimed at investigating the clinical, and psychosocial factors associated with quality of life in patients presenting for facial surgery.
Purpose The main purpose of this study was to assess the quality of life of patients who had undergone facial bones operations as well as to assess their psychological well-being.
Methods The tests were carried out on 42 patients (29 men and 13 women) three days and eight months after their surgeries. The research used Oral Health Impact Profile questionnaire OHIP-14 as well as depression scale PHQ-9.
Results The results of the conducted tests showed that the majority of patients did't experience any depression or symptoms of oral cavity disorders before their surgeries. The most frequent problems that patients faced eight months after the surgery were extensive self-consciousness connected with teeth and oral cavity disorders, discomfort while eating and acute pain in the oral cavity. The most common depression symptoms were sleeping disorders, fatigue or loss of energy and despondency, depressed mood and helplessness. The research revealed a change in psychological well-being of patients between 3 days and 8 months after the surgery both in view of OHIP-14 scale (39 respondents) and PHQ-9 (26 respondents).
Discussion and conclusions The age of patients seemed not to influence the level of mental comfort both in the view of OHIP-14 and PHQ-9 scales. Gender of the respondents turned out to be important – better results were achieved by women. The most crucial conclusion stemming from the conducted research is that patients' quality of lives has considerably improved eight months after the surgery both with respect to oral cavity and psychological well-being and the improvement was statistically significant.

PP112
BARTHEL INDEX AS A PHYSICAL ACTIVITY MEASURE

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Introduction – Daily physical activity is recommended after stroke. Based on aerobic consideration, an efficient activity is defined by a 20 minutes period at 3-5,99 METs (Metabolic Equivalent Task), 3 times a week. However, level of activity still difficult to measured at early stroke phase in rehabilitation. Our hypothesis is that Barthel index could be an activity level's approach.
Material and methods – Patients with recent supratentorial stroke (day 7 to third month) were included and measures were collected at different neuro-rehabilitation's time: first week at admission, one month after and one week before discharge. Sexe, age, NIHSS score and Barthel index were considered. Physical activity was measured at each time point, during 48h, with a triaxial acceloremeter Actigraph® wGT3x+ device and was expressed in METs. Statistical regression was searched.
Results – Patients (8 men and one woman, mean age = 63,1 +/- 13,7 years) were admitted at Stroke unit with a NIHSS score at 11,8 +/- 5,7. At neuro-rehabilitation center's admission, Barthel index was 35 +/- 31,9 ; it increased to 56 +/- 31 at discharge. Twenty-one coupled data (Barthel index and physical activity in METs) were recorded. There is a strong correlation between Barthel index and physical activity ($p< 0,01$)
Conclusions – Further studies are needed to confirm that, in rehabilitation units, Barthel index could be used like physical activity's reflet.

PP113
THE USE OF TWO NEW TOOLS IN THE REHABILITATION OF WORK RELATED STRESS

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Introduction: Health & Working Life (H&A) offers Occupational Health Services to 54,000 employees in Västra Götaland, Southwestern Sweden. Helping employers to reduce sick leave and to facilitate return to work. Stress related conditions constitute 50% of the consultations and the diagnose exhaustion disorder (ICD-10: F43.8) is the most common one. In our experience it is crucial to combine the patient's and employer's perspectives in the rehabilitation process. Recently, a specific work place dialogue (ADA*) and an exhaustion screening tool (LUQSUS*) were developed in Sweden. Both tools provide an overview of the patient's motivation, resources, barriers at work, and private life factors, and ADA also take into account the employer's perspective. This study aimed to evaluate the feasibility of ADA and LUQSUS in clinical settings at H&A.
Methods: The H&A rehabilitation process is team-based. After interviewing the patient and employer with ADA and screening the patient with LUQSUS an overall team assessment was presented to the patient and later jointly to both parties. Satisfaction with the intervention was evaluated with separate questionnaires given to the patients and the employers, providing a Customer Satisfaction Index (CSI) ranging from 0-100 (highest).
Results: The mean CSI ratings were 97 among patients and 71 among employers.
Discussion and conclusions: The CSI outcome was generally positive. The favorable outcome supports previously reported positive results* and concur with our clinical impression of the feasibility of the combined use of ADA and LUQSUS. Due to the promising results, this combination has been implemented on a larger scale in H&A for stress related problems. A LUQSUS upgrade, including the Karolinska exhaustion disorder scale, will be implemented in 2016
Main messages: The satisfaction with two new tools for rehabilitation of exhaustion was high among patients and employ.

PP114
THE EFFECTS OF ANKLE-FOOT ORTHOSIS ON BALANCE AND GAIT AFTER STROKE: WHAT IS NEW?

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Introduction: Stroke is currently the main cause of permanent disability in adults. Sensory, motor, cognitive and psychological impairments can condition limitations in terms of functionality. Gait and balance are usually affected, increasing the risk of falls, secondary injuries and deteriorating quality of life.
Purpose: To analyze the effectiveness of an ankle-foot orthosis (AFO) on balance and gait variables in patients with stroke.
Methods: Systematic review of the literature published until October 2015 in Medline, Embase, CINAHL, AMED, Cochrane Library, Web of Science and Scopus databases. Authors independently identify trials, extracted data and assessed trial quality. All articles written in English, Spanish, Portuguese, French and Italian were included.
Results: Thirty-two randomized controlled trials evaluating balance and walking impairments in patients with stroke using AFO were included for further analysis. The effect of AFO on walking activity ($p<0,001$), walking impairment ($p=0,02$) and balance ($p>0,001$) was beneficial and the benefit was statistically significant. The impact of this type of orthosis on cadence, postural sway and timed mobility tests was non significant.
Discussion and conclusions: The research suggests the benefits of an AFO regarding balance and some gait variables. Therefore it supports the use of AFO after stroke, which can lead to improving functionality and quality of life. The effects and acceptability of long-term usage remain uncertain. Thus, more studies with good methodological quality, randomized controlled clinical trials, are needed to strengthen the results.

PP115
RADIOGRAPHIC EVALUATION OF FLEXIBLE FLAT FOOT WITH RIGID FOOT ORTHOSES: 3 YEARS FOLLOW UP STUDY

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Introduction Flat foot is defined as a foot that has low or absent longitudinal arch. Treatment of flat foot is debateful.
Objective To evaluate the long term effects of a custom-made rigid foot orthosis (RFO) in children over six years old with pes planus.
Methods The medical records of 40 children diagnosed with flexible pes planus, fitted with RFOs based on the inverted technique, and who had more than four consecutive radiological studies were reviewed. The resting calcaneal stance position (RCSP), anteroposteriortalocalcaneal angle (APTCA), lateral talocalcaneal angle (LTTCA), the lateral talometatarsal angle (LTTMA), and calcaneal pitch (CP) of both feet were measured to evaluate foot alignment. A follow-up clinical evaluation with radiological measurements was performed after 12-18 months, 24-30 months, and after 36 months of RFO application. Post hoc analysis was used to test for significant differences between the radiological indicators and RCSP.
Results With RFOs, all radiological indicators and RCSPstatistically significantly improved toward the corrective direction from baseline measurement except LTTCA.LTTCA showed improving tendency but not statistically significant.
Discussion and conclusions RFO is and effective treatment for flexible flat foot , which have significant improvement of radiologic findings after 24 months. The direction of improvement is hind foot to mid foot in flexible flat foot.

PP116
MAMEM- A NOVEL COMPUTER BRAIN INTERFACE PLATFORM FOR ENHANCING SOCIAL INTERACTION OF PEOPLE WITH DISABILITIES - CLINICAL REQUIREMENTS RESULTING FROM FOCUS GROUPS AND LITERATURE SURVEY

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Introduction: With the growing number of people with severe disabilities that live longer and the use of computers for social interactions, we introduce an ambitious objective of TheMultimedia Authoring and Management using your Eyes and Mind (MAMEM) project, i.e., a more natural human computer interfaces based on electroencephalography (EEG)/Eye movements (EMs) technologies.
Purpose: The objective of the project's initial phase was to provide on-going transformational interfaces between the engineering developments and the clinical requirements derived from the specific needs of different patient cohort.
Methods: Health professionals with experience in the field of Parkinson Disease, neuromuscular conditions and tetraplegia following spinal cord injury, from three medical centers, from two countries, participated. We performed a literature survey, focusing on the characteristics of the study population, their computer and internet use habits, existing solutions, and specific challenges related to EEGs and EMs - based –computer-assistive devices. We conducted three focus groups, with six health professionals per group. We also performed a qualitative analysis of the focus groups transcripts. The clinical requirements that resulted at the end of this phase have been then summarized, prioritized and coded with numbers from 1 (minimal) to 7 (maximal importance) by the health professionals from each site.
Results: The clinical requirements addressed the following characteristics of the future platform: personalization (e.g. flexibility with the user's impairments and functional limitations), performances (e.g. safety and durability, adaptability to body positioning), interoperability with the main operating systems (e.g. Windows), usability (e.g. being able to distinguish between intentional and unintentional movements), and EEG/EMs error-correction mechanism or algorithm.
Discussion and conclusions: The clinical information and requirements resulting from this first phase are relevant for engineering specialists involved in the development of the platform. The potential users and their caregivers will provide complementary information in the next phase of the study.
Acknowledgments: This work is part of project MAMEM that has received funding from the European Union's Horizon 2020 research and innovation program under grant agreement No 644780.

PP117
ASSISTIVE PRODUCT PRESCRIPTION AT AN INPATIENT REHABILITATION DEPARTMENT

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Introduction: Assistive Product (AP) is any item, piece of equipment or product system that is used to increase, maintain or improve functional capabilities of individuals with disabilities and are important components in rehabilitation medicine.
Purpose: To analyze AP prescribed at an inpatient general adult rehabilitation department, which cares all type of disability conditions but SCI patients; we also to compare the main aids according to diagnosis.
Methods: Retrospective study of all AP prescriptions (ISO classification) between September 2014 and September 2015, according to main diagnosis.
Results: A total of 253 technical aids were prescribed during that period, of which 70% were for stroke patients, 15% for traumatic brain injury (TBI) patients, 4% for multiple sclerosis, 4% for Guillain Barré syndromes, and the 7% for the group involving amputations, CNS neoplasms, NCS infections and ischemic encephalopathies. The mean technical aid prescription for the entire sample was 2.8 AP/patient, in the stroke group it was 3.2 AP/patient, in the TBI group it was 2.1 AP/patient. In the stroke group there was a difference between etiology: the hemorrhagic stroke had a mean of 3.7 AP/patient and the ischemic stroke 2.8 AP/patient. In the TBI there were also differences: those with polytrauma associated had a mean of 2.5 AP/patient and those with only TBI 1.6 AP/patient. Globally, the most prescribed TA were bimanual wheel-driven wheelchair ISO 12.22.03 (14.6%), ankle-foot orthoses ISO 06.12.06 (12.3%) and seat cushions and underlays for pressure-sore prevention ISO 04.33.03 (11.1%).
Discussion and conclusions: This study shows differences of mean AP/patient needs according to different diagnosis. One of the biggest challenges for rehabilitation professionals is finding a technical device that meets the user´s needs and maintains or increases community participation. High competence in questions related to technical aids is indispensable for any unit dealing with these patients.

PP118
EFFECTIVENESS THE LOKOMAT ON GAIT RECOVERY FOR CHRONIC STROKE PATIENTS

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Introduction: Gait dysfunction is one of the most common impairments after stroke. At present , gait rehabilitation is largely based on physical therapy interventions with robotic approach still only marginally employed. With the Lokomat, a electromechanically exoskeletons, the rehabilitation team can decide the type og guidance and the proper joint kinematic of the patients ¨lower limbs.
Purposes: Evaluate the effectiviness the Lokomat on gait recovery forI chronic stroke patients.
Methods: Randomised controlled clinical trial of 26 patients post-stroke hemiplegia, between 26-85 yews old (60+/-16,4): Control n=12, Bobath concept physiotherapy; Experimental n=14, Bobath + Lokomat. Different test and questionnaires were registered for gait evaluation prior to the study and the end at 3 months. Test Anova was utilized for results.
Results: All of patients improved the equilibrium for the score of Berg Balance test (P=0,01) the distance covered of 6 min walk test (P=0,002), the executive functions for Wilconsin (P=0,001), The Functional Independence Measure (FIM) (P=0,023) and functional gait for FAC Test (P=0,023). The improvement was better in the experimental group that control in up and go test (P=0,026).
Discussion: Several studies support that retraining gait with robotic devices leads to a more successful recovery of ambulation with respect to over ground walking speed and endurance, functional balance, lower-limb motor recovery and other important gait characteristics. Others researches found more improvement during the Lokomat training than during the conventional physical therapy for gait training. Our results revealed also significant responses with both procedures in all variables of study. However, other studies have provided conflicting results regarding the effectiveness of robotic devices for ambulatory and/or chronic patients with stroke, increasing the likelihood of walking independently.
Conclusions: The Lokomat has been effective in the gait recovery for chronic stroke patients in this study.

PP119
BURDEN OF OSTEOPOROTIC FRACTURES IN A PORTUGUESE REHABILITATION CENTER

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Introduction: Osteoporosis is a multifactorial systemic skeletal disease characterized by a progressive decrease in bone mass and microarchitectural deterioration of bone tissue that results in increased bone fragility and a higher fracture risk, which is its main complication. The most common fragility fractures are vertebrae, hip, proximal humerus and distal radius. There were 52 000 osteoporotic fractures in Portugal in 2010 and it is estimated that this will increase in the meantime reaching up to 69 000 in 2025 with high costs to the health system and loss of QALYs. There are few data regarding the prevalence of this type of fractures and characterization of fracture site of patients referred to a rehabilitation Center for Traumatologic and Orthopaedic reasons in Portugal.
Purpose: Assess the burden of osteoporotic fractures in a Portuguese Rehabilitation Center.
Methods: The authors performed a retrospective descriptive study using the clinical files of the appointments of the Traumatologic and Orthopaedic Rehabilitation Consultations in a Portuguese Rehabilitation Center during a three months period. The data was collected from first and follow-up consultations regarding osteoporotic fractures and its type from all the appointments made in this period.
Results: The authors present the results of the study respecting 298 consultations of Traumatologic and Orthopaedic Rehabilitation, 122 women and 43 men with osteoporotic fractures, representing 56% of the patients referred for rehabilitation because of a fracture event.
Discussion and conclusions: Osteoporotic fractures are a huge burden in what concerns to the rehabilitation of fractures in our clinical practice. Rehabilitation care providers must be aware of this reality as one previous osteoporotic fracture episode is a risk factor for others and a formal indication for initiating anti-osteoporotic therapy.

PP120
FALL PREVENTION: ONE OF THE ROLES OF THE PHYSICAL AND REHABILITATION MEDICINE IN THE OSTEOPOROSIS WITH FRACTURE MULTIDISCIPLINARY TEAM

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Introduction: Osteoporosis, the most prevalent metabolic bone disease in older people, is the cause of significant morbidity, increased mortality and substantial use of health resources in particular in patients with fragility fractures. The propensity for fall-related injury in these persons is due to a multiple precipitating causes and predisposing risk factors, which make their diagnosis, treatment, and prevention a difficult clinical challenge. Furthermore, individuals who have fallen have a threefold increased risk of falling again. The most promising prevention strategies involve multidimensional fall risk assessment and exercise interventions. Incorporating these intervention strategies whenever feasible into a fall prevention program seems to be the most effective means for fall prevention in older people. Education is considered as an important part of fall prevention. Therefore, it was created an Osteoporosis with Fracture Multidisciplinary Team (OFMT), a pioneer in the country, where the Physiatrist has a very important role in the recovery of the patient who has suffered a fracture episode with bone fragility. Besides this, patients have support with the aim of providing them good treatment and follow-up, and trying to prevent future fractures.
Purpose: Make a fall prevention information brochure for the older patients and their caregivers followed in the OFMT.
Methods: A systematic review of the literature about "osteoporosis" and "fall prevention" was conducted using the PUBMED. We also used the updated Cochrane review to source current best efficacy evidence on minimizing falls among older people.
Results, discussion and conclusions: The end result is presented in the form of brochure to be used in future in the OFMT.

PP121
CASE REPORT OF ATYPICAL FRACTURES DUE TO LONG-TERM USE OF BISPHOSPHONATES

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Introduction: Bisphosphonates are a commonly prescribed treatment for prevention of osteoporosis-related fractures. Paradoxically, they have been linked to fractures at the femoral shaft, considered atypical, as well as interferences with normal bone consolidation process.
Purpose: The aim of this case report is to promote awareness of this type of fractures and the importance of early detection and treatment.
Methods: We present the case of a 61-year-old woman in treatment with alendronate for 10 years due to osteoporosis in relation to early menopause. Due to a casual fall, she refers pain in her left femur and evident deformity at evaluation. Diagnosed in the ER of "atypical femoral shaft fracture" she was admitted for surgical treatment. During recovery, two days after gait was allowed and the rehabilitation process began, she referred pain in the right hip despite optimal analgesic treatment. A retrospective review of earlier radiographies showed subtle thickening of the lateral cortex of the right femur. Subsequently, CAT scan showed a "right femur insufficiency fracture" that wasn't noticed before, which also required surgical treatment.
Results: According to the current literature on this topic, the chronic use of bisphosphonates can be a risk factor for atypical femur fractures and also interferes with normal bone consolidation process.
Conclusions: The awareness of atypical femoral fractures due to long term use of bisphosphonates and its radiological characteristics holds great importance for its early detection and treatment.

PP122
ANATOMICAL DAMAGE OF WRISTS AND BONE MINERAL DENSITY IN FEMALE PATIENTS SUFFERING FROM RHEUMATOID ARTHRITIS

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Introduction. The objective of the paper is to study the level of anatomical damage on wrists and bone mineral density in female patients suffering from RA, and then to study as to whether there is a correlation between these changes.
Materials and methods. The cross-sectional study covered 100 female patients suffering from RA. On all the female patients, osteodensitometry was performed in the first year after the diagnosis had been made and X-ray images of wrists were also made. The level of anatomical damage on wrists was monitored and assessed applying the Larsenmethod. Thereafter, a correlation was made between the values of the T score and the values of the Larsen index.
Results. In the studied sample of female patients, the total value of the Larsen score was40.46±18.38. By stratification of the values of the scores for the left and the right wrist, it was noticed that the value of the left wrist Larsen score was20.11±9.27 and, of the right one, it was20.35±9.44, without a statistically significant difference(t=-0.696,p=0.488). The total value of the Larsen index was2.05±1.02. By stratification of the values of the scores for the left and the right wrist, it was noticed that the value of the left wrist Larsen index was 2.23±1.03 and, of the right one, it was 2.26±1.05. Bone mineral density was measured in all the female patients and, in 32(32%), osteoporosis was established(T-score - 3.35±1.35). From the moment of verification of osteoporosis, 3.41±1.80 years (from 1 to 5 years) passed on average.
Conclusions. Osteoporosis was diagnosed in 32 female patients suffering from rheumatoid arthritis. The Larsen index is statistically highly significantly correlated with the values of the T score.

PP123
HEMIPARESIS AFTER LONG BONE FRACTURE: A CASE OF FAT EMBOLISM SYNDROME

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Introduction: Fat embolism syndrome (FES) is a severe and sometimes fatal condition that can occur after long bone fractures. It is a syndrome composed by respiratory, haematological, neurological and cutaneous symptoms. The clinical manifestation can range from hypoxemia to coma and death. The most frequent presentation is with respiratory symptoms and signs, although neurological manifestations, such as drowsiness and confusion, are common. There are few reports describing focal signs, such as hemiparesis. Fortunately, the severe neurological symptoms of FES frequently resolve.
Case Report: 65 years old man entered in the emergency room after right leg trauma one hour before. There were no signs of concussion and he described no lack of conscience. He had had a tibia e peroneal fracture that had to be corrected by surgery. While waiting for surgery the patient started to have a confused speech and paresis of the right arm (grade 3 MRC), as the right leg could not be evaluated. A brain CT scan was performed and described no alterations; he also performed a MRI that suggested cerebral infarction due to embolism of anterior and medial cerebral arteries. At the same time he presented hypoxemia, although no cutaneous signs. Regarding these features, FES was the most probable diagnosis and he had to had urgent correction of the fracture. The hemiparesis had the duration of 5 days, with progressively recuperation, although some cognitive functions remain altered.
Discussion and conclusions: This case shows a rare and potentially severe neurological consequence of long bone fracture. There is still no evidence of an efficient treatment to prevent fat embolism syndrome, although many recent studies point to use of corticotherapy as a prophylaxis measure in patients with long bone fracture.

PP124
HIDDEN INJURY: POST STROKE RECOVERY REVEALS FEMORAL NERVE INJURY

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Introduction: Acute ischemic stroke is a common cause of disability and death in developed countries. Endovascular mechanical trombectomy is a possible alternative/adjunct treatment option for systemic thrombolysis in selected cases.
Purpose: to reinforce the value of serial functional and neurological evaluations of post stroke inpatients.
Methods: the authors present a case of a 70 year old woman with a subacute infarction in the territory of the left posterior cerebral arthery. A mechanical thrombectomy was performed. The procedure complicated with a formation of a femoral artery pseudoaneurism. The pseudoaneurism was treated with US guided infiltration using thrombin and fibrinogen.
Results: In the admission to the PMR inpatient care, the patient presented language impairment and right hemiparesis. She had movements against gravidity and resistance in all upper limb segments; she was able to move all lower limb segments only in bed plan.
An intensive rehabilitation program was performed, with progressive overall improvement, except for the recuperation of knee extension, which remained persistently impaired and hindered the gate. Despite right hyperreflexia, the rotulian reflex was absent. Suspecting a femoral nerve injury, EMG and MRI were performed. EMG confirmed acute femoral nerve injury. MRI revealed fibrocicatricial changes around the femoral neurovascular bundle.
Discussion and conclusions: Femoral nerve complications after femoral arterial catheterizations are extremely rare. Possible etiologies include hematoma, pseudoaneurysm, or needling injury.
Here the authors present a case of a pseudoaneurism causing a femoral nerve injury. The authors pretend to underscore how the nerve injury was barely noticeable at first sight, because of the overlapping stroke symptoms, and how the realization of serial detailed physical examinations over time was crucial.
At the time of the last observation, the patient was still unable to extend the knee, but was able to independently get up and walk with walker assistance

PP125
THALAMIC STROKE: CLINICAL CASE AND REVIEW OF CURRENT EVIDENCE ON THE EVALUATION AND REHABILITATION OF SENSORY STROKE WITH ASSOCIATED MOTOR DEFICITS

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Background: 68 year old patient admitted to our Stroke Unit due to an ischemic stroke in the left thalamus, presenting discrete right hemiparesis, right hemianesthesia (touch, pressure, vibration, pain, temperature), associated with severe ipsilateral ataxia, predominantly on the upper limb. We aimed to review the existing literature on the evaluation and rehabilitation approach of pure sensory strokes and the associated motor control deficits.
Methods: Pubmed, PEDro and Clinical Key database search including the terms "evaluation", "motor", "sensory", "stroke", and "rehabilitation".
Results: After abstract revision, 19 articles were selected. The evaluation techniques included: deficits of sensory submodalitites involved in the functional use of the limbs (tactile discrimination, joint position, pressure sensation, weight discrimination, letters tactile recognition); impairment of motor control resulting from somatosensory deficit (paper manipulation, motor sequences, reaching and grasping, thumb-index grip force control) and performance of specific ADLs. Regarding sensoriomotor retraining, approaches included: exploration of the deficit (verbally and physically); specific graded stimulation tasks with progressive difficulty; attentive exploration of the stimuli; prevention of visual dominance; comparison to the non-affected side; quantitative feedback on outcome and performance; use of anticipation; frequent rest with activities over time; reinforced training by constraint of the unaffected limb; mental visualization, mirror and specific practice by self.
Discussion and conclusions: Stroke rehabilitation literature mostly focuses on motor deficits. Sensory impairments (and associated motor control deficits) are common after stroke but often not the focus of rehabilitation. There is emerging evidence that sensation can be improved by rehabilitation and that this improvement may translate into improved motor and functional improvement. In pure sensory stroke, patients may respond better when compared to patients with perceptual disturbances or neglect. Several rehabilitation strategies have been developed. The cognition and motivation of the patient along with tailored rehabilitation programs are paramount.

PP126
EFFECTS OF EARLY REHABILITATION AFTER ACUTE ISCHEMIC STROKE IN CORRELATION WITH INITIAL NEUROLOGICAL DEFICIT GRAVITY

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Introduction Stroke is the first on the list of causes of lasting invalidity. The FIM score represents a simple, practice-applicable test in monitoring the effects of rehabilitation.
Purpose Our objective was to establish impact of neurological deficit gravity on the outcome of early rehabilitation in after-stroke patients, and to investigate the possibility of follow-up of individual parameters of FIM test as a predictor of the outcome of stroke rehabilitation.
Methods 166 patients after acute ischemic stroke were divided into two groups: Group A with graver neurological deficit (86 patients, average age 69.8±4 yrs) and Group B with lighter neurological deficit (80 patients average age 67.8±5 yrs). TOTAL FIM score was assessed upon the admission, and after a 14-day treatment. FIM test parameters were processed separately.
Results According to the TOTAL FIM score there was statistically significant difference between the groups at admission. After 14 days of treatment, both groups showed statistically significant growth in the TOTAL FIM score. Separate parameters of the FIM test (walk, bladder control and colon control) display the same trend of growth after 14 days.
Discussion and conclusions The implementation of early rehabilitation leads to significant recovery of patients following the acute ischemic stroke. Gravity of the initial neurological deficit has no effect on the extent of recovery and rehabilitation success. TOTAL score of the FIM test reflects the effects of rehabilitation as a whole. Because certain parameters of the FIM test, such as walk, control of bladder and colon discharge, show the same trend of growth, they may be used as predictors of the patient's overall recovery.

PP127
THE NEWLY DEVELOPED FUNCTIONAL EXERCISE SYSTEM FOR UPPER EXTREMITY IS FEASIBLE FOR HEMIPLEGIC PATIENTS AFTER STROKE

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Objective: To evaluate the feasibility of using a newly developed a functional exercise device (FEXED) for upper extremity training in hemiplegic stroke patients
Design and Setting The newly developed a FEXED trial, a prospective, randomized, one center clinical trial conducted
Methods: 38 hemiplegic patients allocated randomly to FEXED(n=18, 60.74±11.84 years) and sham group (n=18, 63.42±06.70 years). Patients were stratified by sex, side of stroke, type of stroke lesion, and duration. Both groups were treated with a standard rehabilitation program, and 30 min of extra-rehabilitation training for upper extremity with or without FEXED for 5 days a week during 4 weeks. MMSE, MMT, MAS, Brunnstrom stage, Fugl-Meyer in Upper extremity, 10 second test, box and block test, and FIM were measured as parameters before and after gait training.
Results: At baseline, there were no significant differences in both groups on the assessed demographic, stroke-related, MMSE, and functional characteristics. 1) MMSE, MMT, Brunnstrum stage, Fugl-Meyer in Upper extremity, box and block test, and FIM were improved in both group after treatment ($P<0.05$), but MAS and 10 second test were not. 2) Fugl-Myer in Upper extremity and box and block test were improved in FEXED group than sham group ($P<0.05$). 3) Fugl-Myer in Upper extremity, FIM, and box and block test were greater in the differences before and after treatment in FEXED group ($P<0.05$).
Conclusions: FEXED increase the function of hemiplegic upper extremity. It can be a useful exercise device of upper extremity for hemiplegic patients.

PP128
THE EFFECT OF WHOLE BODY VIBRATOR ON THE SITTING BALANCE IN SUBACUTE STROKE PATIENTS

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Introduction: Whole body vibrator (WBV) is supposed to influence postural control through activating the Ia and II afferents of muscle groups and inducing sensory stimulation. Also WBV can improve proprioceptive function by detecting the stretching of muscles, which activate tonic vibration reflex.
Purpose: To evaluate the effect of WBV in sub-acute stroke patients with impaired sitting balance.
Methods: We enrolled sub-acute stroke patients whose static trunk impairment scale is lesser than 2 point. Subjects were randomly divided into 2 groups, the conventional rehabilitation group (CG) and the whole-body vibration group (VG). CG received conventional physical therapy including sitting balance training, for 30 minutes twice a day, for 2 weeks. VG received each conventional therapy and WBV therapy once a day for the same time. The WBV therapy were conducted by using Sonix® (Sonic world, Wonju, Korea). Frequency was 40 Hz and intensity was 30. Physical therapist supervised patients during the vibration therapy. Trunk Impairment Scale (TIS), Berg Balance Scale (BBS) and Functional Ambulation Categories (FAC) were measured. Korean version of modified Barthel Index (K-MBI) was also measured. These evaluations were conducted at baseline and immediately after 2 weeks vibration therapy.
Results: Twenty four patients were enrolled in this study, 12 patients in CG and 12 patients in VG. After 2 weeks therapy, both group showed significant functional improvement. CG significantly improved on the K-MBI, BBS, TIS-total, TIS-static and VG improved on the K-MBI, FAC, BBS, TIS-total, TIS-static, TIS-dynamic. However, no statistical differences were observed between two groups.
Discussion and conclusions: Our results suggest that WBV therapy have significant effects as much as conventional physical therapy on the recovery of balance and activities of daily living in stroke patients.

PP129
QUANTITATIVE SCORING AND NEUROPHYSIOLOGICAL SIGNAL INDICES FOR POST-STROKE MOTOR FUNCTION ASSESSMENT AND PROGNOSTICATION

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Introduction: In the clinical field, assessment and prognostication of motor function following stroke is still often based on bedside examination which is semi-quantitative and sometimes subjective.
Purpose: To investigate the role of quantitative and multimodal neurophysiological tools in the assessment and prognostication of motor function in the sub-acute phase post-stroke.
Methods: A prospective, case-control study including ten male patients (2-4 months following stroke) and ten matched controls was conducted. Bedside clinical examination was carried out over a number of sessions using the Medical Research Council (MRC) scale for muscle strength, its derived Motricity index and Fugl-Meyer upper limb assessment. A multi-modal neurophysiological signal acquisition setup was also used to record EEG activity, EMG activity and muscle forces at rest and during upper limb movement tasks. The brain symmetry index (BSI), which quantifies the inter-hemispheric asymmetry of electroencephalographic signal power, was subsequently computed from the EEG data. A correlation analysis was conducted to identify any relationships between BSI and the clinical scoring tool measures during recovery.
Results: Strong correlations were found between the bedside clinical tools (MRC scale and Motricity index) and the Fugl-Meyer score ($p=<0.001$). A higher BSI at rest (representing more inter-hemispheric asymmetry) was found in stroke patients ($p=0.023$) when compared to healthy controls. BSI at rest did not correlate linearly with functional scoring tools in the initial session, yet this was found to correlate with the functional outcome as quantified by Fugl-Meyer recorded 1-2 months post-stroke ($p=0.05$).
Discussion and conclusions: Quantitative EEG parameters, particularly the brain symmetry index (BSI) shows promising potential for use in assessment and prognostication following stroke, with an increase in BSI following stroke that correlates significantly with functional motor outcome. Technical feasibility of a multimodal neurophysiological signal acquisition setup was also demonstrated using in-house equipment, encouraging future larger trials in this direction.

PP130
RESPIRATORY MUSCLE ACTIVITIES IN POST-STROKE DYSPHAGIA PATIENTS WITH CONFIRMED SILENT ASPIRATION

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Introduction Aspiration pneumonia is one of most severe complications of stroke which is associated with increased mortality and poor outcomes. Absence of voluntary cough reflex and reflexive cough in stroke patients contribute to poor cough mechanism, thereby increasing the risk of silent aspiration and pneumonia, even with preserved expiratory muscle strength. Moreover, there is possible impairment of respiratory muscles. Despite its importance, there are no studies of respiratory function in patients with dysphagia.
Purpose To determine the cough force and to compare the forces of respiratory muscles in stroke patients with silent aspiration.
Methods 21 dysphagic stroke patients with confirmed silent aspiration(Group 1) were recruited. Cough forces were measured during voluntary coughing(VC) and during reflexively evoked coughing(RC), using a tussive agent(5%citric acid), delivered via a nebulizer. Respiratory muscle activities were recorded using dynamic surface EMG at the rectus abdominis, external oblique, intercostalis, and pectoralis major muscles of the hemiplegic and non-hemiplegic sides, during VC and RC. Comparison was made with a control group(n=21) that consisted of hemiplegic patients with no clinical dysphagia or aspiration(Group 2).
Results Cough forces during VC and RC were comparably weak in group 1 (134 ±92.9, 96.1±72.4 L/min) compared to Group 2 (192.5±75.8, 116.3± 64.8 L/min). Inspiratory and expiratory forces were significantly smaller in Group 1 (33.8±27.6, 45.7±25.9 cm H20) compared to group 2 (58.4±29.4, 64.8+28.8 cm H20). Dynamic surface EMG findings during VC and RC showed comparably weak respiratory muscle actions in the both non-hemiplegic and hemiplegic side, indicating reduced muscle recruitments.
Discussion and conclusions Patients with silent aspiration have compromised respiratory muscle forces during VC and RC. Bilaterally reduced muscle activities were observed in those with silent aspiration during evoked cough response. The contributory role of the diaphragm during reflexive cough is a subject that warrants further studies.

PP131
EFFECTS AND SAFETY ON AN AQUEOUS EXTRACT OF PONCIRUS FRUCTUS RAF. IN STROKE PATIENT WITH CONSTIPATION

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Objective: To evaluate the effects and safety of the aqueous extract of the dried, immature fruit of Poncirus trifoliate (L.) Raf. (Rutaceae)(PF) in stroke patients with chronic constipation.
Methods: A total of twenty two stroke patients were recruited. Patients were interviewed about the clinical informations, constipation score and Bristol stool form scale at twice, before intake PF and after intake PF 2weeks. The total and segmental colon transit time(CTT) were measured by using radio-opaque markers (Kolomark®). The degree of stool retention was evaluated by the plain abdominal radiography and was scored by Leech score.
Results: Before intake PF-W, constipation scores ranged from 3 to 12, average 6.54 ± 2.87 and Bristol stool form scale ranged from 1 to 6, average 3.86 ± 1.21. CTTs were 9.05 ± 6.89 hours, 14.29 ± 10.68 hours, 12.11 ± 7.19 hours and 35.40 ± 19.5 hours in the right, left, rectosigmoid and total colon, respectively. Leech scores were 2.45 ± 0.61, 2.3 ± 0.86, 1.9 ± 0.85, 6.65 ± 1.56 in the right, left, rectosigmoid and total colon, respectively. After 2weeks, constipation scores ranged from 2 to 8, average 4.28 ± 2.05 and Bristol stool form scale ranged from 1 to 6, average 4.17 ± 1.04. CTTs were 7.41 ± 8.86 hours, 11.12 ± 9.12 hours, 8.83 ± 8.75 hours and 27.3 ± 20.2 hours in the right, left, rectosigmoid and total colon, respectively. Leech scores were 1.9 ± 0.64, 2.2 ± 0.69, 1.4 ± 0.88, 5.5 ± 1.39 in the right, left, rectosigmoid and total colon, respectively. There were statistically significant difference in the total and rectosigmoid colon CTT and constipation score, Leech score in right and rectosigmoid colon ($p<0.05$) after PF therapy.
Conclusions: These results suggest that PF was effective and safe therapy in stroke patient with constipation.

PP132
THE INFLUENCE OF POST-STROKE DEPRESSION ON THE ACTIVITIES OF DAILY LIVING AND BALANCE

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Introduction Post-stroke depression (PSD) is one of the most common mental complications suffered by stroke patients leading to an impaired quality of life, altered rehabilitation outcomes, and an increased mortality rate. Additionally PSD significantly limits gait recovery after a stroke. Few studies have investigated the association between PSD and clinical outcomes in the first-onset stroke patients.
Purpose This study evaluated the association between post-stroke depression and clinical out-comes, including activities of daily living and gait balance, in patients with first-onset stroke..
Methods One hundred and eighty inpatients were recruited and followed-up for a 6-month. The depressive, cognitive, and stroke symptoms were assessed using the Beck Depression Inventory (BDI), the Global Deterioration Scale (GDS), the modified Rankin Scale (MRS), and the Berg Balance Scale (BBS). All patients were assessed at baseline and at the end of the observation (6-month).
Results Among 180 patients, 127 (70.6%) were diagnosed with minimal-to-mild depression (MMD) while 53 (29.4%) were diagnosed with moderate-to-severe depression (MSD). The odd ratio (OR) for poor outcome in the MSD group was approximately 3.7 relative to the MMD group. The proportion of patients with better balance classified by the BBS score at 6-month was significantly higher in the MMD group than in the MSD group (OR=1.375).
Discussion and conclusions Our findings demonstrate the potential relationship between PSD and rehabilitation outcomes measured by different rating scales in stroke patients. Our study suggests that clinicians should carefully evaluate depressive symptoms in patients with stroke during routine clinical practice. Adequately-powered and well-controlled further studies are necessary to confirm and fully characterize this relationship.

PP133
THE COMPLICATIONS AFFECTING REHABILITATION EFFECTIVENESS OF PATIENTS AFTER STROKE

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Introduction: Stroke and complications cause approximately 10 percent of deaths worldwide. Complications develope as a result of brain damage or related disability and decreased mobility. Post-stroke complications certainly influence not only the mortality rate but also functional recovery.
Purpose: to determine the complications affecting rehabilitation effectiveness of patients after stroke.
Methods: study of 179 adults, both gender patients after stroke. At least one complication developed in 106 patients (59.2 %). The main complications in the study were as follows: urinary tract infection (25.7 %), mental disorders (22.9 %), pneumonia (11.7 %), shoulder pain (9.5 %) and thromboembolic complications (8.4 %). The effectiveness of rehabilitation was evaluated by Barthel index during inpatient rehabilitation.
Results: Evaluating the changes in Barthel index during rehabilitation of patients who had urinary tract infection and who had not this complication was significantly different (14.2±13.0 vs 18.3±13.7; p=0.047). In patients with mental disorders the change of Barthel index score was significantly lower than in patients without this complication (12.4±10.6 vs 19.0±14.3; p=0.019). The change of Barthel index of patients in whom pneumonia developed was significantly lower than in patients without pneumonia (11.7±13.9 vs 18.3±13.7; p=0.011). Barthel index changes of patients with shoulder pain and without and with thromboembolic complications and without were not statistically significant.
Discussion and conclusions: The development of complications adversely affected the effectiveness of rehabilitation after stroke. Urinary tract infection, mental disorders and pneumonia separately had a negative influence on the effectiveness of rehabilitation, whereas shoulder pain and thromboembolic complications did not impact the effectiveness.

PP134
CHANGES OF MEDICAL ENVIRONMENT IN STROKE REHABILITATION AFTER THE FOUNDATION OF REGIONAL CARDIOCEREBROVASCULAR REHABILITATION CENTER

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Introduction Stroke is the leading cause of long-term disability. Regional cardiocerebrovascular rehabilitation center was designated to effective stroke care. However, difference between before and after the establishment and long-term outcomes are less clear.
Purpose To evaluate the effect of Regional cardiocerebrovascular rehabilitation center and changes of medical environment in stroke rehabilitation.
Methods We conducted a retrospective medical record review of data from 3820 acute ischemic stroke patients from January, 2010 to December, 2014. Regional cardiocerebrovascular rehabilitation center is established at March 2011 and Critical pathway (CP) in stroke patients was implemented to effective stroke care. Comprehensive stroke center effectiveness was compared between before and after the establishment of comprehensive stroke center. Patients characteristics between two groups were compared based on factors including demographic factors and pre-existing medical conditions.
Results After the establishment of comprehensive stroke center, patients showed significantly increased number and transfer rate to Department of rehabilitation. Comparative analysis of the two patient groups revealed that patient's initial NIHSS score and educational background was a significant factor (p=0.000). Patient's initial stroke scale and educational background seemed to affect the patient treatment course: discharge from Department of Neurology or transfer to Department of Rehabilitation. Patient`s stroke severity who being transferred to department of rehabilitation are decreased significantly.
Discussion and conclusions The establishment of Comprehensive Stroke Center lead to a significant increase of patient transfers to the department of rehabilitation and decrease of length of stays in department of neurology. We need further study to evaluate the functional improvement between patients who discharged from department of neurology and discharged after being transferred to department of rehabilitation, such as ADL, mRS.

PP135
ROBOTIC GLOVE - A NEW METHOD IN HAND REHABILITATION

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Introduction: The robotic mechanisms in the spectrum of neurological recovery of patient post-stroke meant going on a different path, changing the way we think about rehabilitation.
Purpose: Because the physical recovery time for the hand of a patient who has suffered a stroke is, in average, 6 months, the introduction of new kinetic and electrostimulation technique was necessary in order to achieve an optimal level of functionality.
Methods: The authors present the research study that has been achieved in the post-stroke hand rehabilitation. This study was focused on the development of a lightweight and low-cost robotic glove for post stroke patients. The patients can wear and use the glove in order to help them recover their hand functionality. There are two types of robotic glove structure: exoskeleton and soft robotic glove. Our work focuses on obtaining the same movement from the fingers of the robotic glove as the motion of the human hand. We analyzed by image processing a tele-operated robotic hand. Different mechanical motion and transmission solutions, actuation systems (electric, pneumatic and shape-memory-alloy (SMA) actuation systems) were tested for robotic gloves. Finally, we performed two modalities of rehabilitation actions: tele-operation glove with flexors sensors and a program based actions.
Results: Practical results prove the functionalities of the robotic gloves in common operating conditions. The soft of robotic gloves is a better solution for rehabilitation of the post stroke human hand, as lightweight, portable, and compliant wearable systems. This soft robotic glove could be combined with eletrostimulation with rectangular current, or magnetic field generating a rectangular current, and also with neurofeedback technique in order to improve the rehabilitation
Conclusions: We believe that the future of rehabilitation medicine, especially regarding the hand post-stroke patients is the robotic assisted technique, especially the robotic glove.

PP136
ESTIMATING TOTAL ENERGY EXPENDITURE AFTER STROKE USING ACCELEROMETERS

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Introduction: Monitoring participants' expenditure energy (EE) using accelerometry is becoming more commonly applied in stroke studies. Howewever, individuals after stroke had typical kinetic and kinematic of movement who influenced the EE estimation by accelerometers.
Purpose: The purpose of this study was to examine the validity of severals accelorometers commonly used in stroke studies(1). (Armband Sensewear® (multisensory device); Stayhealthy® RT6TM; Actigraph GT3X+B® (tri axial devices) to estimate the total energy expenditure (TEE) after stroke compared to indirect calorimetry, over activities of daily living.
Methods: Thirty eight participants (age: 65,7+/- 13,5) with various aged strokes were recruited and simultaneously monitored with accelerometers and portable metabolic system. The devices were placed on the non paretic ankle, hip and wrist as recommended. The participant performed for routine activities (transfers, manual task, walk, up and down stairs). TEE was measured by Cortex Métamax 3B® and compared to the TEE estimated by accelerometers.
Results: Bland Altman analysis revealed a mean différence around 5% for activities of transfers (0,24kcal; 2,0%), walk (-1,2kcal; 4,1%) and manual task (0,7kcal; 6,1%) for the Armband. For Actigraph, Bland Altman analysis gave a mean différence of 0,2kcal (1,6%) for manual task when it was placed on the wrist and 5,3kcal (16%) for the walk when it was placed on the ankle. However the lower and upper limits of agreement were high, around 100 percent. RT6 gave an underestimation of TEE over 20%.
Conclusions: This study showed a high dispersion of the estimation of TEE by 3 accelerometers commonly used.
1. Gebruers N, Vanroy C, Truijen S, Engelborghs S, De Deyn PP. Monitoring of Physical Activity After Stroke: A Systematic Review of Accelerometry-Based Measures. Arch Phys Med Rehabil. 2010 Feb 1;91(2):288–97.

PP137
EFFECT OF HIGH FREQUENCY REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION IN PATIENTS WITH POST-HEMIPLEGIC COMPLEX REGIONAL PAIN SYNDROME

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Objective: To investigate the effect of high frequency repetitive transcranial magnetic stimulation (rTMS) in patients with post-hemiplegic complex regional pain syndrome (CRPS) within the first 6 months poststroke.
Subjects and methods: Twenty patients diagnosed with CRPS of hemiplegic upper limb according to the International Association for the Study of Pain (IASP) diagnostic criteria and triphasic bone scan within the first 6 months poststroke were included. We performed a double-blind and placebo-controlled study. Ten patients were assigned to the real rTMS group, while the others were sham rTMS group (n=10). Each subject received 5 consecutive rTMS sessions (once a day) at 10Hz to the motor cortex (M1) contralateral to the CRPS-affected side. Each stimulation session consisted of a total 1,000 pulses at an intensity of 90% of rest motor threshold (RMT) for a period of 20 minutes. rTMS was delivered with butterfly-coil. Before rTMS, we determined individual RMT of the first dorsal interosseous muscle (FDI), using single-pulse stimulation of the hand area on the motor cortex contralateral to the affected upper limb. The intensity of pain, using the Visual Analog Scale (VAS), score of CRPS clinical severity, and affected hand size measured by the figure-of-eight method were assessed before rTMS, daily, and 1week and 1month after the last session.
Results: There were no significant differences in CRPS stage between the two groups. The baseline pain intensities according to the VAS was similar prior to real and sham rTMS. During treatment there were significant reduction of VAS and hand size in the real rTMS group. But the decreased pain intensities (VAS) and hand size were not persist after 1month. Additionally, score of CRPS clinical severity didn't significantly decrease in both groups. Sham rTMS caused no changes in individual pain intensity and hand size.
Conclusions: High-frequency rTMS was effective in relieving pain of upper limb and affected hand size in patients with post-hemiplegic complex regional pain syndrome (CRPS) within the first 6 months poststroke during the stimulation session. Long-lasting effects after the rTMS seem to be absent.

PP138
ARTERIAL STIFFNESS IN SUBACUTE STROKE: CHANGING PATTERN AND RELATIONSHIP WITH FUNCTIONAL RECOVERY AFTER REHABILITATION

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Introduction Brachial-ankle pulse wave velocity (baPWV) has been proposed as a simple, noninvasive method for estimating arterial stiffness, and also has a significant predictive value for cardiovascular mortality and morbidity among stroke patients.
Purpose To investigate the changing pattern of arterial stiffness and functional outcome at 1 month and 3 months after stroke onset, and to determine whether baPWV at 1 month after stroke onset is of predictive value in terms of short-term functional recovery after rehabilitation in patients with subacute stroke.
Methods Sixty subacute stroke patients (43 males and 17 females; average age, 62.7 years) were enrolled for this study. BaPWV was measured as indices of arterial stiffness. Functional assessments included 6-minute walk test (6MWT), Fugl-Meyer assessment–hemiparetic upper and lower extremities (FMA-UE, FMA-LE), Functional ambulatory category (FAC), Berg balance scale (BBS), Korean Mini-Mental Status Examination (K-MMSE), and Korean-Modified Barthel Index (K-MBI). Above all measurements were conducted at 1 month and 3 months after stroke onset, and all patients received conventional rehabilitation during a mean follow-up period.
Results BaPWV (1703.8 vs 1641.8, $p=0.049$), 6MWT (187.5 vs 248.0, $p<0.001$), FMA-UE (42.6 vs 46.2, $p=0.001$), FAC (3.1 vs 3.8, $p<0.001$), BBS (35.8 vs 43.9, $p<0.001$), K-MBI (72.9 vs 80.6, $p<0.001$) measured at 1 month and 3 months after stroke showed statistically significant improvements after rehabilitation. BaPWV, FMA-UE, FMA-LE, K-MMSE, 6MWT, BBS and K-MBI at 1 month after stroke correlated significantly with K-MBI at 3 months after stroke. BaPWV, FMA-UE and K-MBI at 1 month after stroke were significant independent predictors of follow-up K-MBI.
Discussion and conclusions These results indicated that arterial stiffness as well as functional outcome showed significant improvements after rehabilitation during the subacute phase of stroke, and the measurement of baPWV at 1 month after stroke might be useful in predicting short-term functional recovery in patients with subacute stroke.

PP139
PEAK CARDIORESPIRATORY RESPONSES DURING AQUATIC AND LAND TREADMILL IN PATIENTS WITH SUBACUTE STROKE

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Introduction Reduced cardiovascular fitness is a well-studied physical impairment in stroke patients. There is relatively limited evidence for cardiorespiratory responses during aquatic and land treadmills.
Purpose To investigate cardiorespiratory responses elicited during exercise stress tests using an aquatic treadmill (ATM) and a land treadmill (TM) in patients with subacute stroke.
Methods Twenty-one subacute stroke patients (13 males and 8 females; average age, 57.0 years) were enrolled for this study, and all subjects participated in two symptom-limited incremental exercise protocols (ATM and TM). For the ATM protocol, subjects were submerged to the upper waist in 28˚C water. The treadmill speed started at 1.5 km/h and increased 0.5km/h every 2 minutes thereafter. For the TM protocol, the speed started at 1.5 km/hr and increased 0.5 km/h every 1 – 2 minutes until the tolerable maximal speed, and then grade was elevated by 2% every 2 minutes thereafter. Oxygen consumption (Vo_2), metabolic equivalents (METs), heart rate (HR), and respiratory exchange ratio (RER) were measured continuously with peak values. Rating of perceived exertion (RPE) was recorded immediately after each test, and percentage of the age-predicted maximal HR and total exercise duration were also recorded.
Results When comparing peak cardiorespiratory responses during ATM and TM protocols, Vo_2 peak (22.0 vs 20.0, p=0.02), METs peak (6.3 vs 5.8, p=0.02) were significantly greater in ATM than TM, and RPE peak (17.6 vs 18.4) was significantly lesser in ATM than TM. HR peak, percentage of age-predicted maximal HR, and total exercise duration were similar for both protocols. There was a significant linear relationship between HR and Vo_2 with ATM protocol.
Discussion and conclusions This study demonstrated that aquatic treadmill exercise elecits better peak cardiorespiratory responses compared with land treadmill exercise, suggesting that aquatic treadmill exercise could be as effective as land treadmill exercise in patients with subacute stroke.

PP140
THE EFFECTIVENESS OF A HOME-BASED VIDEO-GAME SELF-TRAINING PROGRAM FOR IMPROVING THE UPPER EXTREMITY OF INDIVIDUALS WITH CHRONIC STROKE; A PILOT RANDOMIZED CONTROLLED TRIAL

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Introduction On-going rehabilitation services are needed to maintain and improve the weaker upper extremity of individuals with chronic stroke. Video-games provide repetitive, task-specific training and have been used by clinicians in rehabilitation. It is unknown if self-training using video-games can benefit the weaker upper extremity (UE).
Purpose The purpose of this study aimed to compare the effectiveness of a newly-developed video-game self-training protocol to a traditional self-training program in terms of functional ability and daily-use of the UE.
Methods This pilot single-blind randomized controlled trial included assessments pre, post and 4-week follow-up by blind assessors. Participants were randomly allocated to video-game or traditional self-training and requested to self-train (one hour/day, 6-times/week for 5-weeks) following 2-home visits. Self-training during the 4-week follow-up was optional. UE function and daily-use was assessed by the Action Research Arm Test (ARAT) and the Motor Activity Log (MAL).
Results Thirteen participants (N=10 standing) (mean±SD age – 59.1±10.5, 19.6±11.3 months poststroke) took part in the video-game self-training and eleven participants (mean±SD age 64.9±6.9, 13.0±6.0 months poststroke] performed traditional self-training (UE exercises and activities, seated). Participants performed 18.8±8.0 hours playing video-games and 27.4±5.6 hours of traditional-self-training during the 5-weeks. A significant within-subject effects were found for ARAT for both groups between pre to post ($F=21.1$, $p<0.01$) and pre to follow-up ($F=17.9$, $p<0.01$). Significant improvement for both groups was also demonstrated for amount of UE daily-use between pre to follow-up ($F=6.4$, $p=0.019$).
Discussion Similar to traditional self-training, self-training using video-games can improve functional ability and daily-use of the weaker UE of individuals with chronic stroke.
Conclusions Video-games should be utilized to provide on-going activity for maintaining and improving the UE of individuals with chronic stroke.

PP141
INPATIENTS AFTER STROKE: COULD WE PREDICTING FUNCTIONAL OUTCOME?

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Introduction Few studies have investigated the influence of different factors at admission as possible predictors of functional outcome after rehabilitation. It seems important to establish factors involved in determining the results after stroke rehabilitation, because may be useful for determining the functional improvement.
Purpose To assess factors that may influence functional gain after rehabilitation therapy in survivors of stroke.
Methods Setting in Neurological Rehabilitation Unit, A Coruña. Participants: We retrospectively identified all persons with a diagnosis of stroke who were consecutively admitted between January 1, 2010 and December 31, 2014. The data points collected were age, gender, unit admission, pre-stroke living area, type of stroke, laterality of impairment, length of stay (LOS), and discharge destination. Functional Independence Measure Scale (FIM) was used to assess functional capacity and discharge FIM was compared with different factors. Comparisons for quantitative variables were made using the Student's t-test or Mann–Whitney test, depending on which was considered appropriate, after checking for normality using the Kolmogorov–Smirnov test. Qualitative variables associations were analyzed using Pearson's ÷2 -test. Logistic regression analysis was used to identify the variables associated with FIM
Results Of 365 patients with stroke treated at our Unit, 256 were ischemic stroke, 62,2% were male, mean age was 66,8±12,0, 183 from urban area, 48,2% left-hemispheric strokes, 41,6% had derived from Neurology Unit, 76,7% were totally independent pre-stroke, the LOS was 78,7±49,0, discharge FIM was 83,4±26,3 and 330 were discharged home after rehabilitation. Logistic regression model with gender, age, unit admission, type of stroke and pre-stroke independence degree was adjusted. We objectify that the variables that significantly modifies was unit admission, type of stroke and pre-stroke independence degree.
Conclusions Our study indicates that ischemic etiology, admitted from Neurology Unit and pre-stroke independence degree, are important stroke outcome predictors.

PP142
KOREAN VERSION OF MINI MENTAL STATE EXAMINATION(MMSE-K)USING MOBILE VIDEOCONFERENCING TOOL (FACETIME®): A VALIDATION STUDY

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Introduction: Cognitive dysfunction after stroke has considerable impact on quality of life and level of independence, and follow up assessment and appropriate management of cognitive impairment is necessary. However, accessibility to medical facilities is limited due to physical impairment in these patients. For this reason, telemedicine has been studied for decades and many previous researches provide equivalent efficacies with conventional treatment or assessment. With information and communication technology improving, much more compact, portable, and easy-to-use videoconferencing tool has been available, and smart-phone is one of the useful gadget in this regard.
Purpose: The objective of this study is to determine the validity of the Korean version of the Mini-Mental State Examination (MMSE-K) administered via mobile videoconferencing tool(FaceTime®)compared to face-to-face administration.
Methods: At a single institution, thirty patients with ischemic or hemorrhagic stroke were included in this study(male 20, female 10, mean age 69.8±12.9). To validate mobile administration of MMSE-K, Face-to-face (T_f) and remote assessment (T_r) via FaceTime® was done with three-day interval,alternatively. Patients were randomly assigned to either assessment order. For the remote assessment of MMSE-K, iPhone 5S (Apple, iOS 8.0) and iPad mini 2 (Apple, iOS 8.0) with a videoconferencing application (FaceTime®) was used for the participants and the examiner, respectively. Additionally, in-person collaborator recorded MMSE-K score (T_{rc}). The scores of face-to-face and remote administration of MMSE-K were compared using the intra-class correlation coefficient (ICC) to obtain validity.
Results: ICC of remote and face-to-face assessment was 0.95(T_r =24.4±4.85, T_f=24.9±4.76). ICC of remote and in-person collaborator was 0.99(T_r =24.4±4.85, T_{rc} =24.0±4.98).It demonstrated high ICCs over different assessmentmodalities and good validities of remote administration of MMSE-K.
Conclusions: The results showed a great potential of the smartphone application to be a valid tool for the assessment of cognitive function in clinical practice. Further research needs to investigate intra-raterand inter-rater reliability of each assessment.

PP143
PROLONGED HOSPITALIZATION DUE TO SOCIAL, ECONOMIC AND OTHER FACTORS IN STROKE PATIENTS

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Introduction: Social, psychological and economic reasons such as social support, family support, health insurance, fear for caring at home and lack of infrastructure planning at home, have been related to prolonged hospitalization of patients with stroke during the rehabilitation phase.
Purpose of the research: To identify the main factors associated with prolonged hospitalization in stroke patients with severe motor deficits.
Materials: A total number of 730 patients was registered (years 2010-2015), among them 131 were patients with stroke (Right hemiplegia : 21, Left hemiplegia : 26 and Bilateral: 1). 39 patients were men (mean age : 55,4 years) and 7 were women (mean age : 60,5 years).
Methods: A structured interview was used to collect data by patients and family members, during psychology sessions incorporated in rehabilitation program.
Results: 48 patients were hospitalized for more than 100 days, an increased number considering that our LoS average is 48 days. Out of total, 43 patients had a supportive environment 24 hours a day, 10 had low economic status while 4 appeared with no health insurance. 12 delayed their discharge due to home barriers .14 patients caregivers expressed their fear considering return at home. Medical reasons for prolonged hospitalization were recorded in 8 patients.
Conclusions: Prolonged hospitalization is associated with patient's economic status, health insurance and family environment as well the spatial configuration of the home. It appears that 1:3 of patients with stroke are staying longer than the usual with a consequent increase in hospitalization costs.

PP144

FRAME OF IMPROVEMENT ORIENTED TO EVERYDAY LIVING ACTIVITIES THROUGH TASK-ORIENTED THERAPY, PLAYING AND COGNITIVE RETRAINING IN PATIENTS WITH STROKE

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Introduction: Patients with stroke present a variety of deficits, which result on inability of retrieving full functional independency in everyday activities. A program focused on the ADL can contribute significantly in their social reintegration.
Purpose: To describe the frame of intervention, oriented to improving the participation of patients with stroke in ADL, through task oriented activities, cognitive retraining and playing.
Materials and methods: The 12 participants (m=9 and f=3) aged <55 with stroke and right hemiplegia.The patients were evaluated with MBI and MCA wich performed 4 times during the program. The first 3 in the beginning of each week and the fourth at the end of the program. The sessions had 30 minutes duration, 5 times a week, for 4 weeks, during inpatient rehabilitation. The patients participated in task oriented activities,which included feeding, getting dressed, personal hygiene and activities from standing position, games and cognitive retraining.
Results: After 4 weeks of program, in 7 men and 2 women the Barthel score raised from 31-49(severe dependence) to 76-90 (mild dependence) and the mini mental raised from 21-24 (mild disorder of mental function) to 26 (incipient disorder).
Discussion :The participation of patients with stroke in occupational therapy program, which includes task oriented activities, cognitive activities and games, strengthens the use of the hemiplegic side and enhances the bilateral participation of upper limbs.
Conclusions:The stroke patients often present various deficits, which hamper their participation in everyday life. The program, focused on ADLs, contributes significantly in their social reintegration

PP145
KOREAN VERSION OF THE COGNITIVE ASSESSMENT SCALE FOR STROKE PATIENTS: A RELIABILITY AND VALIDITY STUDY

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Introduction The post-stroke cognitive impairment is associated with quality of life and has a strong influence on recovery from stroke. Mini mental state examination (MMSE) has been widely used for screening cognitive impairment for the patient with stroke; however it has some limitations in that it does not include multiple cognitive domains that could be impaired in stroke patients. In addition, the presence of language disorder makes it more difficult to evaluate the orientation, memory and recall. Cognitive assessment scale for stroke patients(CASP), a newly developed screening test for post-stroke cognitive impairment, can be a good alternative because it includes various cognitive domains and it can be administered to patients with severe expressive aphasia, as well.
Purpose The objective of the present study is to develop Korean version of CASP and to evaluate the test reliability and validity of Korean version of CASP(K-CASP) in stroke patients.
Methods The original CASP was translated into Korean by two physicians, back translated to English, and compared to the original version. The translated version received the written consent from the author of CASP. Eleven stroke patients admitted to Physical Medicine and Rehabilitation units were assessed using the K-CASP by two physicians twice with one-day interval to test reliability. Rehabilitation treatment or drug administration was not changed between the time intervals. To assess validity of K-CASP, patients were divided into two groups according to cut-off score of K-MMSE (≥24).We used the intra-class correlation coefficients (ICC) in order to evaluate the reliability of the K-CASP.
Results Mean scores were 24.91(±10.06, total 36) for the K-CASP and 24.09(±4.64, total 30) for the MMSE. The score of K-CASP was significantly correlated with K-MMSE($r=0.911, P<0.01$). The intra-rater(test-retest) reliability of the K-CASP was 0.991. The inter-rater reliability was 0.985.
Conclusions K-CASP is a reliable and valid screening test for cognitive dysfunction in stroke patients, and is not inferior to the MMSE in the detection of patients with cognitive impairment.

PP146
IMPROVING DISTAL PERIPHERAL MOTOR CONTROL USING DYNAMIC TAPE AND MYOFASCIAL THERAPY IN STROKE PATIENTS

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Introduction Increased number of patients with neurological pathology (stroke) addressing rehabilitation departments determines those involved in complex rehabilitation program to try to find new treatment methods or adapting existing methods. The loss of motor control in affected hemi-body causes disability, which alters performing ADL.
Purpose In this study we have tried to find if we can improve the distal motor control in the lower limb, thus improving walking scheme, using taping techniques and myofascial therapy.
Methods We have selected a group of 15 patients with stroke, aged between 25 years and 75 years, in the first 6 months after stroke. After clinical and functional assesment,informed consent,we divided the patients in 2 groups;one received only kinethotherapy(15 patients) and the second group received myofascial release and dynamic tape(15 patients).Rehabilitation program for the first group consisted in kinetotherapy and electrotherapy,daily for 2 weeks(except Saturdays and Sundays). Rehabilitation program for second group consisted in 2 sessions per week with myofascial release and 3 session with dynamic tape. The 2 weeks of treatment was repeated 3 months consecutivelly. We have assesed the angle between backside of calf and calcaneus before and after treatment and ground attack with the heel.
Results After completion of treatment we observed; -the second group had an improvement of 10 degrres in the angle between calf and calcaneus compared with control group. -the second group had an improvement in the walking scheme-10 of 15 patients using heel for ground attack-compared with control group.
Conclusions: Although myofascial therapy and dymanic tape it is not used frequent in the rehabilitation program of stroke patients is a method of treatment within reach of physiotherapists and well tolerated by patients -in the group of patients that we have treated there was no spasticity increase, but this aspect needs more further evaluations in future.

PP147
VIEWS AND EXPERIENCES OF PHYSICAL TRAINING IN PEOPLE WITH STROKE OR OTHER BRAIN INJURY

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Introduction Physical activity after stroke promotes neuroplasticity, physical functions, daily activities, health and well-being. People with stroke are shown to be less active than healthy controls which is a risk for decline in function as well as getting a new cardiovascular event. To improve guidance further knowledge regarding attitudes and factors significant for physical activity is needed.
Purpose To explore participants' experiences of physical activity after stroke or other brain injury.
Methods Ten semi structured interviews were analysed, using qualitative content analysis. Interviews were read several times by the authors and a coding scheme based on key concepts related to the research questions was developed. All codes retrieved from the interviews were grouped into categories. To catch the latent meaning, categories were formulated into themes. Three woman and seven men with a median age of 51 years undergoing rehabilitation after stroke (n=7) or other brain injury (n=3) were interviewed.
Results Three themes were identified: 1.The participants had mixed experiences and views on the significance of physical activity prior to injury. 2. After injury they experienced a new situation and saw exercise as a duty. Physical activity after injury was limited to short walks a few times a week. 3.Factors of importance for executing physical activity: Advice and support from a physiotherapist or other professionals were highlighted as very important. Support from significant others, fellow patients and to see progression towards set goals contributed as motivating factors. Physical and mental factors, especially balance and walking impairments as well as fatigue and lack of motivation were perceived as hindering.
Discussion and conclusions After injury, physical activity was perceived as filled with demands, a necessary evil to achieve as good function as possible. Dependence on security in the training situation, support and push from professionals and relatives were evident.

PP148
POST STROKE CHECKLIST, VALIDATION OF THE SWEDISH VERSION (PSC-S)

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Introduction: In Sweden about 25 000 experience a stroke every year. One of three survivors will remain significantly disabled in the long term. The number of survivors is expected to increase and follow-up after stroke will become important. The Post-Stroke Checklist (PSC) is a simple tool to identify unmet needs within eleven long-term problem areas; secondary prevention; activities of daily living, mobility, spasticity, pain, incontinence, communication, mood, cognition, life after stroke and relationship with caregiver. It has been tried in the UK and in Singapore with positive responses reported and is posted on the website of the World Stroke Organization.
Purpose: The purpose of the study was to evaluate the feasibility and usefulness of the Swedish version of the Post-Stroke Checklist (PSC-S) with stroke survivors and health-care personnel, and assess its relevance.
Methods: After a forward-backward translation process, focus groups were used with persons with prior stroke and comments from health-care personnel for further validation. PSC-S is tested in clinical settings at specialized care at the hospital and in a primary/community care center. Data from 20 patients from each level of health-care has been collected as well as impressions from health-care personnel.
Results: The results based on focus group-discussions indicate that patients might have difficulties to explain their needs, especially concerning cognitive or emotional problems. PSC-S was valued to cover relevant problem-areas after stroke according to patients and health-care personnel. The result highlights the importance of using the PSC-S in combination with an interactive dialogue to be able to capture potential problems. Additionally it was considered important that identified needs also should be completed by appropriate interventions.
Discussion and conclusions: The consensus from the group-discussions was that the PSC-S eleven problem areas were relevant after stroke and the structure in combination with dialogue would improve long-term follow-up in Sweden.

PP149
VOXEL-BASED LESION SYMPTOM MAPPING FOR POST-STROKE DEPRESSIVE MOOD IN ISOLATED CEREBELLAR STROKE

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Introduction: Post-stroke depressive mood (PSDM) is the most common psychological sequelae of stroke. Patients with PSDM have poorer rehabilitation outcomes, lower quality of life, and higher mortality. The relationship between PSDM and lesion location have been a controversial issue. Even though insights in the modulatory role of the cerebellum in cognition and affect are continuously growing, a role of the cerebellum in PSDM is underexplored.
Purpose:To investigated relationship between PSDM and lesion location in isolated cerebellar stroke patients using voxel-wise statistical analysis.
Methods: The medical records and MRI data for first cerebellar stroke patients between 2005 and 2014 were reviewed and recruited. Depressive mood was evaluated by Geriatric Depression Scale (GDS). Whole-brain T1-weighted images were acquired and the lesion borders were drawn onto the original 3D images, using the MRIcro software. The 3D brain scan and lesion volume were then normalized to a standard brain template using Statistical Parametric Mapping-12. First, we classified patients into two groups according to GDS score, non-depressive and depressive (cut off < 17). The comparison between the two groups was obtained by subtraction analysis and voxel-by-voxel chi square test. Second, voxel-by-voxel t-test comparing the scores between patients with and without lesions was performed.
Results: Thirty-one patients were analyzed. No significant differences were detected between groups according to age, sex, elapsed time after onset and lesion volume. Significant association between severity of depressive mood and lesion location were found in lobule VII, VIII and crus II of Lt. Cerebellar hemisphere ($P_{uncorrected}<0.05$).
Discussion and conclusions: This study indicated that damage to part of posterior lobe of Lt. Cerebellar hemisphere were associated with PSDM. These data support that the cerebellum has the potential role in control of emotions. Further investigation is needed to reveal a concrete process of human emotion.

PP150
DYSPHAGIA ACCORDING TO CONTRALATERAL PRE-EXISTING LESIONS INVOLVING CBT IN UNILATERAL CORONA RADIATA STROKE PATIENTS

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Introduction Corticobulbar tract(CBT) is a very important tract involved in swallowing. CBT from one side of the brain project to the motor nuclei on both sides of the brainstem, therefore it is thought that impairment of CBT from only one side could save swallowing function because the tract of the other side is safe. HSI lesions on T2-weighted MRI are frequent incidental findings, and they include age-related white matter changes(ARWMCs) and previous stroke sequelae.
Purpose The aim of this study is to investigate dysphagia according to contralateral pre-existing lesions involving CBT in unilateral corona radiata stroke patients with CBT involvement.
Methods It was a retrospective study and patients admitted to the Department of Neurology during september, 2011 to August, 2014 and patients with the first unilateral ischemic stroke within 7 days of onset, with corona radiata lesions involving CBT were included. All patients (n=87) went on bedside swallowing test (BST), and feeding method at admission was determined. After BST, some of the patients (n=16) who needed objective examination went on videofluoroscopic swallowing study (VFSS).
Results There was no difference in baseline characteristics between patients with pre-existing lesions involving CBT (n=20) and patients with pre-existing lesions without CBT involvement or no lesions (n=67). Feeding method at discharge showed significant difference according to contralateral pre-existing lesions involving CBT. ASHA NOMS showed significant difference, and PAS tended to present difference between the two groups. Using multivariate logistic regression analysis and multivariate linear regression analysis, it is found that 'pre-existing lesions involving CBT', but not age, is the factor influencing feeding method at discharge and ASHA NOMS.
Discussion and conclusions Unilateral corona radiata stroke patients who have contralateral pre-existing lesions involving CBT seem to have dysphagia more than the others, and the prognosis of dysphagia is poor.

PP151

THE IMPACT OF POST-ACUTE CARE REHABILITATION ON FUNCTIONAL STATUS IN STROKE PATIENTS FROM DIFFERENT HOSPITALIZATION PATH: A TAIWAN STUDY

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Introduction: In Taiwan, stroke is the most common disease of prolonged hospital stay. Thus, Taiwan Ministry of Health and Welfare implemented a national program of Post-acute Care for Cerebrovascular Diseases (PAC-CVD) in March 2014. Under the intensive in-patient rehabilitation programs and per diem payment, the difficult position about prolonged hospital stay was expected to be solved. However, the stroke patients still had no strong truth for transferring to local hospitals.
Purpose: The purpose of this study was to investigate the impact of intensive post-acute stroke rehabilitation on functional status in different hospitalization path.
Methods: The stroke patients who were admitted to our hospital post-acute ward during 2014/03/01 to 2015/9/30 were indicated to the study. The patients was separated to group 1 (referred from medical center) and group 2 (transferred from the regional hospital). The modified Rankin Scale (mRS) score , Barthal Index (BI), Instrumental Activities of Daily Living Scale (IADL) and Berg Balance Scale (BBS) were used to evaluate functional status.
Results: 115 stroke patients (23 patients in group 1, and 92 patients in group 2) were included. The length of days (LOS) between stroke onset and post-acute care (PAC) ward admission were 16.22 days in group 1, and 9.24 days in group 2. The length of days in PAC ward were 28.96 days in group 1, and 25.88 days in group 2. The severity (MRS grading on PAC admission day) was 3.39 in group 1, and 3.54 in group 2. The functional improvement after rehabilitation training was more obvious in group 2.
Conclusions: The regional hospital could offer efficient post-acute care rehabilitation programs, shorten the length of days in the hospital and decrease the medical cost. The government should instruct the local hospital qualify system to strengthen the trust of the people.

PP152
COMPARISON OF BRAIN AND MOTOR ACTIVITY DURING THE VIRTUAL AND REAL DARTS GAME IN PATIENTS WITH STROKE

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Introduction: Stroke is a neurological disease that causes several sensorimotor impairments.
Purpose: This research aimed the comparison between brain and motor activity during virtual and real darts games in stroke patients.
Methods: The participants included four patients (aged 41-69 years) and three healthy individuals (aged 38-60 years). The participants had 15 trials to play a real and a virtual darts game (XBox 360º Kinect). The brain activity was analyzed through Emotiv EPOC® (EEG Portable) and the motor activity through kinematic analysis of the elbow by Qualisys Motion Capture System and percentage of correct answers to the target. The data was analyzed by t'Student test.
Results: According to results, we found similarities between the virtual and real darts games as the primary motor cortex activation of the right cerebral hemisphere, however, the virtual game can activate more areas of multisensory integration (parietal, temporal and occipital cortices). The virtual and real darts games differ in kinematic parameters and motor performance where smaller angle of elbow extension ($p< 0.0001$) and greatest motor performance on target were found in the virtual darts game ($p< 0.0001$).
Discussion and conclusions: Thus, the virtual and real environment have different advantages, requiring careful clinical evaluation of patients in order to direct the application of the game to the goal of treatment in Neurorehabilitation.

PP153
THE EFFECTS OF THROMBOLYTIC THERAPY IN PATIENTS AFTER STROKE

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Introduction: Application of thrombolysis in the first three hours of the onset of symptoms of ischemic stroke significantly improves the outcome.
Purpose: Assessment of patient recovery by NIHSS scale before and after the thrombolytic therapy in relation to the sex and age, lateralization of the lesion.
Material and methods: This study was organized as a prospective study included 34 ((24 men, 10 women) patients treated after stroke at the Emergency Center, Clinical Center of Vojvodina in Novi Sad. Data were obtained on the basis of history data and a survey carried out on patients at the Emergency Center. Recovery was assessed by NIHSS and modified Rankin scale were applied to assess the function.
Results: The average age of patients in this study was 66.59 ± 12.6 years. The majority of patients in this study had a right-hand hemiparesis 19 (55.88%), and 15(44.12%) patients had left-sided hemiparesis. The most common risk factor for stroke was arterial hypertension in 11(32.4%) patients. Disruption of speech had 20 (59%) of the patients after stroke. In this study, thrombolytic therapy received 17 (50%) patients. The most common side effects of thrombolytic therapy were flour and vomiting (23.5%). The average value of NIHSS for men was 11.0 and 8.16, and for women after stroke was 12.9 and 10.5 on admission and discharge, respectively. The mean values obtained at the end of acute rehabilitation phase for were statistically significantly decreased ($p<0.01$).
Conclusions: The results obtained in this study show that the value of NIHSS scale at admission and at discharge of patients with and without thrombolytic therapy showed a statistically significant improvement, but have established a certain degree of regression of neurological deficit.

PP154
PHYSICAL THERAPY IN PATIENTS WITH PUSHER BEHAVIOUR: CASE SERIES

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Introduction: The pusher syndrome was first described in 1985 by P. Davies . It was defined as a patient who actively "pushed" with their non-affected extremities towards their most affected side, presenting a strong resistance to the attempts of the therapist to bring them to a vertical position.
Purpose: The aim of this study is to determine the effectiveness of a physiotherapy protocol in reducing pusher behaviour in patients who have suffered a stroke.
Methods: This is a prospective study in which a total of 10 patients previously diagnosed with pusher syndrome are analysed using “Burke lateropulsion scale” and Scale for Contraversive pushing. As the primary variable, the reduction of these symptoms is analysed. In addition, functional capacity is assessed using the Barthel Index and PASS scale as secondary variables. The specific physiotherapy treatment protocol is to normalise the tone of the less affected limb and progressively move the load over to that side. All this besides standing, and, where possible, walking. The assessment was made each time after ten treatment sessions with a total of four evaluations.
Results: Of the 10 patients studied, 60% were male and 40% female. With an average age of 67.4. 60% suffered a hemorrhagic stroke and 40% an ischemic stroke. 60% had an injury to the right hemisphere and 40% to the left. After physiotherapy treatment all patients improved scores on scales, in four of these cases it was completely reduced. An improvement in functional outcomes was also noted when measured with the PASS scale but not with the Barthel index.
Discussion: This physical therapy protocol has proven effective in reducing symptoms. Functional capacity also improved when measured with the PASS scale.
Conclusions: This can serve as a starting point but further research is needed to compare this protocol with other techniques.

PP155
IMPROVEMENT IN PALSY OF THE 3RD CRANIAL NERVE IN 36 YEARS OLD PATIENT AFTER SUBARACHNOID HEMORRHAGE WITH THROMBUS IN GIGANTIC ANEURYSM OF BASILAR ARTERY - CASE STUDY

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Introduction: 36 year old female after subarachnoid hemorrhage with a thrombus within a gigantic aneurysm of the basilar artery admitted to the Department of Neurological Rehabilitation for the rehabilitation treatment. On admission the patient was conscious, without verbal contact, able to execute simple commands. Patient presented plegia of right upper limb and paresis of right lower limb, absence of superficial and deep sensation, right side positive Babinski sign and palsy of the 3rd left cranial nerve. The 3rd cranial nerve controls the movement of four of the six eye muscles, constriction of the pulpit, the positioning of the upper eyelid and the ability of the eye to focus. Exotropia, ptosis and mydrasis are symptoms of impairment of the 3rd cranial nerve.
Purpose: Presentation of non-invasive improvement in palsy of the 3rd cranial nerve.
Methods: Accordingly to clinical status and oculomotor nerve palsy following procedures were implemented: contralateral exercises (selected exercises of the muscles of the right eye), covering the right eye during activities in daily living and stimulation of the ciliary muscle in the left eye with white light.
Results: After ten weeks of treatment the upper left eyelid fell to the half of the pupil, there was a discreet divergent strabismus of the left eye, the pupil of the left eye was still wide and papillary light reflex was absent. The patient did not report diplopia when looking at close objects but it appeared when the patient was looking right into the distance. The patient was unable to draw the left eyeball medially.
Discussion and conclusions: Presented treatment of the 3rd nerve palsy resulted in notably decreased exotropia and ptosis but did not influence mydrasis. The functional and cosmetic effects were satisfying for patient. Complex rehabilitation in this case was time-consuming and involved patient and rehabilitation team.

PP156
IMPROVEMENT OF MOTOR FUNCTION AND LANGUAGE SKILLS AFTER TRANSCRANIAL DIRECT CURRENT STIMULATION IN A PATIENT WITH BILATERAL TRAUMATIC DISSECTION OF INTERNAL CAROTID ARTERY: A CASE REPORT

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Introduction: Transcranial direct current stimulation (tDCS) applies electrical current directly on the scalp and induces polarity-dependent changes within the sensorimotor cortex. The use of tDCS in stroke rehabilitation modulates cortical excitability and allows direct interaction with maladaptive neural plasticity and thereby improves motor and cognitive functions. Recent studies have shown the effect being greater when the current is applied on both hemispheres, by using a bipolar montage.
Purpose: To describe a Case report of a 49-year-old man who suffered a bilateral posttraumatic dissection of internal carotid artery (ICA) during a car accident in June 2015. After the stroke he developed a right sided hemiparesis and Broca's aphasia, 1.5 month later he was admitted to rehabilitation programmes.
Methods: The patient received bipolar montage 2.0 mA tDCS with the anode applied on the affected hemisphere (primary motor cortex - M1) and the cathode placed on the contralateral side. The tDCS was applied for 5 days (20 min each session), coupled with task-oriented training. Language, motor function and dexterity was assessed before the start and 8 weeks after the end of the last tDCS session.
Results: After the stimulation right hand function improved: Wolf Motor Function Test average time (50.9 to 2.5 s) and functional ability (2.1 to 4.3); Fugl-Meyer Assessment (22 to 59 scores). Language comprehension and expression also improved: Frenchay Aphasia Screening Test (8 to 20 scores) and Token test (30 to 7 scores).
Discussion and conclusions: Similar to previous studies we observed positive effects of bihemispheric tDCS on the motor function and dexterity of the affected upper limb after stroke. Additional interesting observation was that tDCS with the anode applied on the M1 could also have an important effect on the language recovery in a patient after a bilateral posttraumatic dissection of ICA.

PP157
ASSESSING CORTICAL EFFECTS OF ELECTRICAL STIMULATION THERAPY: A REVIEW

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Introduction: Neuromuscular stimulation has been used as one potential rehabilitative treatment to restore motor function and improve recovery in patients with paresis, eliciting neural changes that convey motor changes and altered cortical organization patterns. These cortical changes produce decreased functional limitation and impairment levels
Purpose: To assess the impact of electrical stimulation on motor recovery and changes in cortical activation patterns
Methods: A survey was undertaken through electonic databases using the keywords: FES AND motor recovery, FES AND cortical activation
Results: Reviewing the studies assessing cortical effects upon FES, we can observe a trend towards severe impairment leading to activation of contralesional site, whereas less impaired patients tend to recruit the ipsilesional site. Good recovery of hand function is correlated with an increase of ipsilesional brain activitivy over time, whereas larger strokes with worse outcome engage contralesional sites
Conclusions: It remains a question why FES influences cortical reorganization. It seems that afferent feedback provided by FES can induce changes of motor networks in human cortex, facilitating brain plasticity. It is also hypothesized that antidromic stimulation lead to a synchronized pre- and postsynaptic coupling and enhanced synaptic remodeling.

PP158
ELECTROSTIMULATION FOR PROMOTING MOTOR RECOVERY OF THE UPPER LIMB AFTER STROKE: A REVIEW

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Introduction: Surface neuromuscular electrical stimulation (sNMES) has been recommended as a safe method to improve upper limb outcome after stroke. Proposed mechanisms include: stimulation of the somatosensory cortex by augmented sensory feedback, increased proprioceptive stimulation as a result of muscle activaction, motor re-learning, increased muscle strength, improved joint alignment, reduced spasticity, and modification of visuospatial deficits.
Purpose: To assess the efficacy of sNMES in enhancing the upper extremity motor and functional recovery of acute and subacute stage stroke patients.
Methods: A survey was undertaken through electonic databases using the keywords: neuromuscular electrical stimulation AND stroke, neuromuscular electrical stimulation AND upper extremity.
Results: Subgroup analyses showed that patients with no upper limb function at recruitment had a greater chance of regaining arm function when treated with sNMES. However nonsignificant improvements in complex functional arm movements (Action Research Arm Test-ARAT¸ Fugl-Meyer motor assessment) was found. The effect of treatment ceased after the discontinuation of the intervention. About the specific magnitude parameters of stimulation, no relationship between frequency and clinical outcome was found, whereas wide-pulse stimulation scheme (1000μs) increased the torque in the paretic arm. Beneficial clinical outcome were also found in pain and contractures prevention, without any effect on spasticity.
Discussion and conclusions: It is not clear whether these improvements are associated with systemic effects of electrical stimulation, in particular effects associated with increased cortical excitability via antidromic signal transmission in sensory nerves and the resultant neural plasticity and/or effects on muscle physiology. It is possible that in a severely disabled group of patients, the duration of treatment may need to be longer. Research is needed to address specific questions about the type of electrostimulation that might be most effective, in what dose and at what time after stroke.

PP159
THE ABILITY OF PATIENTS AFTER STROKE TO MAINTAIN PERSONAL HYGIENE AT THE BEGINNING AND THE END OF REHABILITATION

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Introduction: A large number of patients involved in rehabilitation after a stroke are completely dependent of help of an others in terms of personal hygiene.
Purpose: Determine patients' ability to maintain personal hygiene after a stroke at the beginning and the end of rehabilitation. The ability to maintain personal hygiene was examined in relation to the degree of mobility, present complications and the age of the patients.
Methods: The study was conducted in the Institute for Physical Medicine and Rehabilitation – Ward for neurorehabilitation. During three months, medical records of 189 patients had been analyzed.
Results: The average age of the sample was 67,46 years. 79,4% of patients were at first rehabilitation and 21,6% at second or more. Average number of days from stroke till beginning the first rehabilitation was 50,56 days. At the beginning of rehabilitation 40.7% of patients were immobile, 24,9% were moving with the help of a 34.4% were independently mobile. At the beginning of the rehabilitation of completely dependent care and assistance were 49,20 % patients, depending in part were 38,09 % and 12,69 % patients were independently. At the end of rehabilitation 68,8 % were in better condition, 16,4 %, were the same, worse were 3,2 %, and at 10,1 % rehabilitation interrupted because of complications and exitus letalis in 1,1 % of the sample.
Discussion and conclusions: A large number of patients involved in rehabilitation after stroke are completely or partially dependent on other person's aid, what requires great efforts, both in terms of the number of caregiving staff and amount of work needed to provide adequate care to the patients. The presented results show patients' progress in autonomy to maintain personal hygiene improvements what confirms that the institution has good medical care, treatment and rehabilitation due to contemporary recommendations.

PP160
STROKE REHABILITATION AFTER DISCHARG FROM HOSPITAL: DOMICILIARY VERSUS MEDIUM-STAY CENTERS

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Introduction. Purpose The aim of our study is to compare the functional ability and perceived health status of stroke patients treated by a domiciliary rehabilitation team or at rehabilitation medium-stay centers after discharge from hospital.

Methods: This prospective observational study involved 100 patients with a diagnosis of ischemic stroke (March 2011-June 2013), who were treated and followed by our rehabilitation unit for six months. After discharge, half of the patients received a specific domiciliary rehabilitation program (DRP) and the other half at medium-stay centers (MSC). Data was retrieved on admission, discharge, first and third month after discharge. Statistical analysis: Stata ($\times^2$test)

Results: Mean age:72,43 years; >65years (DRP/MSC): 67%/84%. Family support (DRP/MSC): 77%/62%. Mortality (DRP/MSC):12%/22.2%. Complications (DRP/MSC):6.9%/70%

Residence at third month (DRP/MSC): Home 100%/44.7%. Institutionalized:0%/55,3%

Both groups had statistically significant results (p>0.001) in:

- Improvement of neurological deficit as measured by the NIHSS (DRP/MSC): admission=26.53%/78% severe, 55.1%/18% moderate, 18.3%/4% light; discharge=70.8%/24.2% light, 28.2/48.4**%** moderate, 0%/28% severe; third month=95%/39.6% light, 5%/41.8% moderate, 0%/12.4% severe.
- Improvement in stroke-related specific disability as measured by the SIS-16 (DRP/MSC): discharge= 56.6%/88.8% disability, first month=16.2%/69.4% disability, third month=12.2%/47% disability.
- Improvement of general disability as measured by the Rankin scale(DRP/MSC): admission=100%/100%, discharge=74.8%/98%, first month=68.8%/95%, third month=21.4%/83.3%.
- EQ-5D third month (DRP/MSC)=60.8%/85.2% bad health state, 24%/0% regular, 19.4%/9.6% good. VAS:49,7

Discussion and conclusions: Both strategies of rehabilitation treatment, domiciliary and medium-stay centers, are effective for recovery of function and improvement of neurological deficit and disability -as measured by the NIHSS, SIS-16 and mRS scales- after ischemic stroke when carried out from the first stage in Stroke Care Units. The stroke patients who received domiciliary rehabilitation program had lower initial neurological deficit and were younger than those who were at medium-stay centers. These aspects could be the cause of better results in disability scales.

PP161
PREDICTING FACTORS OF APHASIA RECOVERY IN STROKE PATIENTS – LITERATURE REVIEW

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Introduction: Aphasia is an acquired brain damage of language processing present in 20%-40% acute stroke patients. At 6 months around 12-18% of these maintain identifiable aphasia. Doctors are frequently faced with the challenge of predicting aphasia recovery patterns and long-term outcomes in these individuals.
Purpose: The aim of this review was to analyze predicting factors of recovery, either patient or stroke related, in stroke patients with aphasia.
Methods: The authors searched for the literature published in the Cochrane Library and Medline databases between 2000 and 2015, using the terms "stroke", "aphasia", "post-stroke aphasia", "aphasia recovery", and "aphasia prognosis". 124 articles were found and 11 of these were selected according to their suitability for the pre-set target, with preference given to scientific and systematic reviews or randomized controlled trials.
Results: The prognosis of aphasia recovery after stroke results of an interaction of multiple variables related to either the patient and his environment as well as with stroke-related circumstances. Patient-related factors such as gender, handedness, socio-economic status and education were not identified as robust predictors of aphasia recovery. Age is currently the only patient-related factor presenting mixed evidence. Features related to location and size of lesion, aphasia type and severity, initial hemodynamic response and treatment received, have been identified as determining factors in the prognosis of aphasia recovery after stroke. The factor identified as the most predictive was the initial severity of aphasia during the 2-4 week post-stroke period, suggesting an optimal prognostic time window.
Conclusions: It is challenging to predict aphasia recovery after stroke in clinical practice as it depends of a complex relationship between factors associated to the lesion itself, the patient and treatment received, in addition to the relevant role of neuroplasticity. Findings reported in this review highlight information that can contribute to guide evidence-based outcome of post-stroke aphasia.

PP162
THE EFFECT OF DIFFERENT PHYSIOTHERAPY MEASURES ON THE AFFECTED ARM FUNCTION IN PATIENTS AFTER STROKE

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Introduction. Based on research suggests that patients after stroke physiotherapy currently applied a mirror feedback (MFB) is an effective tool to improve arm function, but works dealing with patients after stroke combination of conventional physiotherapy and MFB impact affected arm function, is not enough.
The purpose of the study was to determine the effect of different physiotherapy measures on the affected arm function in patients after stroke.
Methods. Thirty-six patients after stroke (16 men and 20 women) took part in the research. The patients were grouped randomly into the following two groups: conventional physiotherapy was applied on patients of group 1, while conventional physiotherapy and mirror therapy was applied on patients of group 2. The patients of group 1 (conventional physiotherapy) had 15 physiotherapy sessions 5 times a week for 30 minutes per day. Meanwhile, the patients of group 2 (conventional physiotherapy and mirror therapy) had 15 physiotherapy sessions + 9 sessions using a mirror (3 times a week for 20 minutes a day). To evaluate the effectiveness of physiotherapy use: Fugl-Meyer Upper Extremity Examination, Wolf-Motor Function test, Box and blocks test, dynamometry.
Results. Affected arm function after rehabilitation has improved in both groups ($p < 0.05$), but using a mirror feedback violated hand coordination, dexterity and muscle strength changes in terms dynamometry, Box and blocks, Wolf-Motor Function and Fugl-Meyer Upper Extremity Examination tests were more significant. The comparison of the results has revealed that conventional physiotherapy with visual feedback was more effective when recovering the affected arm function.
Conclusions. Combined physiotherapy along with work using mirrored feedback was more effective in restoring affected arm function of patients after stroke.

PP163
THE EFFECTS OF MIRROR THERAPY ON CENTRAL FACIAL PARESIS IN SUBACUTESTROKE PATIENTS

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Introduction: Facial paresis is one of the most common sequelae after stroke.It leads to functional and aesthetic defects of the stroke patients. Generally, orofacialexercise are practiced to facial paresis after stroke, but few study was proven the effectiveness of the exercise. Moreover, any other effective therapy is not proven yet.
Objective: The aim of this study was to investigate the additional effects of visual feedback training using mirror therapy on facial paresis after stroke.
Methods: A prospective randomized controlled study of 21 post stroke patients receiving inpatients rehabilitation was performed. The experimental group (n=10) applied conventional orofacialexercise therapy and additional orofacial exercise using mirror therapy, whereas the controlgroup (n=11) treated only with conventional orofacial exercise therapy. Mirror therapy was this:1. Use mirror application,and reverse right and left. 2. Cover the half of the screen of tablet PC, that opposite to un-affected side. 3. Do oro-facial exercise with looking the screen. Therapy was conductedfor fifteen minutes, two times for a day, total 14 days. All patients were checked the Regional House-Brackmann Grading Scale (HBGS) and the length between the corner of the mouth and earlobe at rest and during smile in bilateral side before and after the therapy. We calculated the difference and the ratio between bilateral side to compare the change of improvements between the two groups.
Results: Baseline characteristics are similar between the two groups, including age, sex, type of stroke(ischemic or hemorrhagic), basal Modified bathel index(MBI), K-MMSE and NIHSS(except 4 patients, not recorded the score). The HBGS, length differencesand length ratio between bilateral side during rest and smile showed significant differences after therapy in both groups. Compared to both groups, the improvements of facial movement which is measured by the length ratio (p-value = 0.009) in additional mirror therapy group weresignificantly larger than conventional therapy group, but not by length differences.(p-value = 0.063)
Conclusions: This study showed the effects of conventional orofacial exercise therapyon facial paresis after stroke. And, additional visual feedback training using mirror therapywas more effective than conventional orofacial exercise therapy only. This study was small sized, so more enlarged studies will be conducted to confirm the effectiveness of the new rehabilitation method on facial paresis after stroke.

PP165
DESIGN OF A NOVEL WEARABLE END-EFFECTOR ROBOTIC SYSTEM FOR HAND REHABILITATION

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Hand rehabilitation is a difficult probolem for stroke patients. Rehabilitation training based on robotic systems has shown enhanced outcomes of rehabilitation. A novel wearable hand end-effector rehabilitation device is designed to assist finger flexion and extension motions for post-stroke patients with paralyzed hands. Considering the residual function of hands, we need different rehabilitation strategies. The device is a four-link underactuated system which assists finger motioins by drawing fingertips. There are two kinds of training modes: passive mode and active mode. In the passive mode, it applies a continuous motion for each finger independently. It can assist patients to accomplish the grasp movement and thumb-index finger pinch. The device is able to detect sudden spasm and then stop training automatically. In the active mode, it detects patients' motion intent via sensors at fingertips. Exercises can be triggered by single detection or continuous detections of the motion intent. Through the introduction of the interactive virtual reality environment in rehabilitation, patients' training initiative can be more stimulated. The device is also integrated with a hand therapy software system that allows a physiotherapist to conduct hand exercises and analyze motion data.
The pilot study shows that the proposed rehabilitation system is capable of flexing and extending the fingers with correct trajectories. The device matches the human hand compatibility and has properties of portability, less complexity and easy donning.

PP166
LEUKOARAIOSIS AND FUNCTIONAL OUTCOME IN PATIENTS WITH SUBCORTICAL INFARCT

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Objective Leukoaraiosis is a common finding among patients with ischemic stroke and has been associated with poor stroke outcomes. We studied the influence of leukoaraiosis on the functional outcome of subcortical stroke for the subacute period after onset.
Methods We retrospectively analyzed 152 collected patients with acute subcortical infarct (corona radiate with or without basal ganglia infarct) at a single center from September 2011 to May 2015. Of these, the patients who previously had history of stoke or cognitive impairment had excluded and forty one patients were enrolled. Functional outcome was assessed at acute phase (the time when transferred to the department of rehabilitation medicine) and subacute phase (discharge). We explored the relationship between LA severity at admission and clinical outcome at the time of discharge (approximately a month from onset), as assessed by the modified Rankin Scale (mRS) and functional ambulation caterogies (FAC). LA severity was graded as mild, moderate, or severe on the Fazekas scale. Mann-Whitney test was performed to identify the correlation between the severity of LA and the functional outcomes.
Results Severe LA was diagnosed in 2 patients (4.8%), moderate LA in 8 patients (19.0%), mild leukoaraiosis in 19 patients (45.2%), and no leukoaraiosis in 12 (28.6%). In this study, we compared the absent or mild LA group(Group A) with moderate/severe LA group(Group B). Baseline characteristics of the study cohort by leukoaraiosis severity are shown in Table 1. There were no significant difference in the baseline characteristics of the study cohort by leukoaraiosis severity except for age and modified Barthel index (mBI). In comparison of no/mild group and moderate/severe group, there was significant difference in mRS and FAC at both acute and subacute phase. (Table 2)
Conclusions Leukoaraiosis is known to be related to age and function in stroke patients. In this retrospective study, severe leukoaraiosis predicted poor functional outcome, including ambulatory function at both acute and subacute phase after stroke onset.

PP167
EFFECT OF PROPRIOCEPTIVE NEUROMUSCULAR FACILITATION TECHNIQUES ON KNEE JOINT MOTOR CONTROL IN STROKE

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Introduction: Proprioceptive Neuromuscular Facilitation (PNF) currently is one of the mainstream treatment techniques for the motor function rehabilitation of stroke in the world.
Purpose: Surface electromyography technology was used in this study to observe lower limb sEMG activity after PNF training in stroke patients, to analyze excitability changes of agonistic and antagonistic muscle.
Methods: Random sampling and cross-sectional design were performed to evaluate effecacy of PNF contract relax agonist contraction technique(CRAC) on knee joint motion by sEMG signal in stroke survivors.
Results: The study included a total of 44 cases of stroke subjects. When subjects in Brunnstrom I-II take PNF-CRAC isometric resistance knee extension at non-affected side (step 1), rectus femoris EMG activity at affected side was significantly increased than sitting at rest; Rectus femoris EMG activity at affected side was also significantly increased than sitting at rest When patients in Brunnstrom III, IV, V & VI take PNF-CRAC isometric resistance extension knee at affected side. With the increase of Brunnstrom scale, lower extremity motor ability increased and sEGM value of the non-affected rectus femoris had gradually declined. These research results show that PNF-CRAC had good irradiation effect, appropriate resistance training can cause excitement in the contralateral side, and the irradiation effect weakened with motor function in patients improving. When subjects in Brunnstrom III, IV, V & VI take PNF-CRAC active knee extension, EMG signals of the rectus femoris muscle increased than before training, and CCI of the rectus femoris muscle and hamstring muscle significantly increased than before training as well.
Discussion and conclusions: PNF-CRAC technology had good excitement irradiation effect to increase the stability of agonist excitability and knee joint, to improve knee joint motion control ability, to promote the recovery of lower extremity motor function of hemiplegia.
Supported by the Shanghai Municipal Science and Technology Commission Key Medical Project(No. 13411951100) and Shanghai Kang Kang Hospital Development Center emerging technology projects(No. SHDC12014126)

PP168
THE ROLE OF NON-INVASIVE HALO ORTHOSIS FOR THE REHABILITATION OF PREGNANT WOMEN WITH STROKE INDUCED BY OCCLUSION OF VERTEBROBASILAR ARTERY COMBINED WITH DISPLACED ODONTOID FRACTURE

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Introduction Vertebral artery occlusion or injury have a high association with cervical fractures including atlanto-axial fractures and displaced fracture. Most patients with rotational vertebral artery occlusion exhibit a stenosis or anomaly of the vertebral artery at the C1-2 level during head rotation, which compromises the blood flow in the vertebrobasilar artery territory. No report exists on the optimal treatment of vertebral artery occlusion induced by odontoid fracture.
Case Report A 49-year-old woman presented to our hospital with multiple co-morbidity. She had been locked-in state when she was admitted another hospital before she admitted to our hospital. She was diagnosed as acute pontocerebellar infarction secondary to occlusion of vertebrobasilar artery and was found pregnant with gestational age around 6 weeks. One month after stroke onset, she was transferred to our hospital with the state of bed-ridden and she had tracheostomy tube and gastrostomy tube. Our neurologist checked brain MRI/MRA and found bilateral pontine, right cerebellar infarction and diffuse narrowing of vertebral and basilar arteries. Incidentally there was displaced odontoid process fracture and subluxation of atlanto-axial, atlanto-occipital joint. We assumed rotational vertebral artery occlusion was the mechanism of stroke because she had no risk factor for stroke. As recovered, she could sit down with support 3 months after stroke and we applied non-invasive Halo orthosis to limit rotation and extension neck movement for preventing occlusion of vertebrobasilar artery. She received comprehensive rehabilitation treatment, improved without evidence of neurologic deterioration, and could stand alone and eat orally with left hand 5 months after stroke when she was discharged. After discharge she had receiving rehabilitation treatment with orthosis as an out-patient and finally gave birth by cesarean section without neurologic deterioration.
Conclusions Non-invasive Halo orthosis should be considered in patients who have an occlusion of vertebrobasilar artery combined with displaced odontoid fracture.

PP169
THE STROKE AND HAEMOPHILIA

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Introduction: The spontaneous intracerebral hemorrhage in thaemophilia is rare. It can be responsible of hemiplegia. It causes deterioration of the orthopaedics disorders which are specific to haemophilia.
Observation: A 43-years-old man, had a stroke when he was 8 years old. It causes a proportional right hemiplegia without speech disorders. He was first hospitalized in children unit than reoriented into hematology. where the diagnosis of haemophilia was established. Nowadays, the patient presents as aftereffects a right hemiplegia, an orthopaedic disorder involving the knees, the ankles, and the elbows. The disorders have a right predominance; suggesting a pejorative role of the pyramidal syndrome in worsening the arthropatic hemophilia. The patient describes difficulties to walk, to going up and downstairs which are improved by the use of a Canadian cane.
Conclusion: The extra-joint bleeding in haemophilia aggravate the handicap of the patients who are a victim. the handicap of the patients who are a victim.

PP170
PARAPLEGIA AND NICOLAU SYNDROME: A CASE REPORT

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Introduction: Nicolau Syndrome also known as livedo like dermatitis is a rare complication of intramuscular injections. Neurological damage is described in 1/3 of the cases. We report the case of a serious complication: motor and sensory paraplegia.
Observation: Child aged 11 years with no particular medical history who receives an injection of benzathine benzylpenicillin for an acute tonsillitis. Soon after are recognized: Severe pain and bruising at the injection site, a total functional disability of the lower limbs followed by extensive bullous lesions from the same site. Evacuated to pediatric emergencies, the child was pale, afebrile in average condition. The lower limb is infiltrated and covered by an ecchymotic and Bullous purpura with a global motor deficit, Leukocytosis and a positive CRP. Analgesics, antibiotics, hydration and a short corticosteroids thérapy are prescribed. Follows the emergence of rhabdomyolysis complicated by an acute renal failure with preserved dieresis, an HTA, edema of the lower limbs and pelvis, a bilateral hydrocele, hyperkalemia and hyponatremia treated by extra kidney cleansing, rehydration, nifedipine, and establishment of urinary catheter. The Doppler ultrasound of the lower limbs made in the context of emergency is normal. Brain and spinal cord MRI are made after stabilization to support a diagnosis. At day 20, the child is received in our service for driving a flaccid motor and sensory paraplegia with myalgia at lower limbs. The skin lesions are healing, joint tests are normal; the child is confined to the wheelchair with a FIM to 72. At day 60, clinical examination is that of T9 incomplete motor and L5 sensitive incomplete levels of paraplegia. The testing and functional assessment improved: child walking with walker posterior splints and take-up system of the ankles. FIM to 97.
Discussion: The mechanism involved seems to be an ischemia by embolus or vascular spasm after accidental intra arterial injection. This syndrome appears to be the arterial equivalent of Tachon syndrome in the veins. The suction, the technique of Z-track injection, the quantity, the seat and the type of injected products seem to play a role in the prevention of this syndrome.

PP171
FROM OTITIS TO PARAPLEGIA" – ENCEPHALOMYELORADICULITIS FOLLOWING PNEUMOCOCCAL MENINGITIS – CASE REPORT

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Introduction: Encephalomyeloradiculitis (EMR) is a brain, spinal cord and spinal roots inflammation, considered as a variant of acute disseminated encephalomyelitis. Marrie et al (1995) review described EMR as a unique neurologic syndrome; defined as a febrile illness with progression in a few days to neurologic dysfunction with altered consciousness, paraparesis/tetraparesis, neurogenic bladder and poliradiculopathy. It's also possible cranial nerve or brain stem dysfunction occurrence.
Purpose: The purpose is to describe, for the first time (in our knowledge), that EMR can occur in association with Streptococcus pneumoniae meningitis (and a consequent complete paraplegia); EMR natural course; prompt diagnostic approach need; treatment options, including precede and advanced Physical Medical Rehabilitation (PRM) care.
Methods: The authors report a clinical case of a 30 year old female with EMR (including paraplegia) secondary to Streptococcus pneumonia meningitis; EMR main characteristics; literature review.
Results: 30 years old female, otitis diagnosis, which has shown evolution to pneumococcal meningitis, admitted in Intensive Care Unit (ICU). Within days, she developed symptoms of EMR with altered consciousness, cortical/romboencephalic and medullary lesions, flaccid paraplegia, lower extremities reflexes absence, neurogenic bladder, T8 sensory level, III and VII cranial nerve impairment. Pluridisciplinary medical diagnose in ICU was not simple. Immunoglobulin treatment was administered. PRM evaluated the patient in the first days of ICU internment, contributing to final diagnosis and immediately started an integrated team rehabilitation program, which had a crucial importance to patient functional recovery.
Discussion and conclusions: EMR should be considered an unique neurologic syndrome. Authors report, for the first time (to the best of our knowledge), EMR can occur with Streptococcus pneumoniae meningitis (in this clinical case with a serious medullar lesion leading to paraplegia). Pluridisciplinary team evaluation (UCI, Neurology, PRM), precocity attentiveness to and prompt diagnose, adequate rehabilitation treatment planning, PRM internment careful follow-up are fundamental.

PP172
PARAPARESIS AS A RESULT OF FACET HEMORRHAGIC SYNOVIAL CYST COMPLICATED WITH A MEDULLARY TIBIAL BONE INFARCTION: A CASE REPORT

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Introduction Spinal synovial cysts, also known as juxtafacet cysts, are an infrequent cause of back and radicular leg pain. The majority occur in the lumbar spine, especially the L4-L5 level, and are associated with facet joint osteoarthritis and spondylolisthesis. Rarely, synovial cysts can become hemorrhagic through an uncertain mechanism, though factors such as trauma and anticoagulation may play a role.
Purpose We present a case report about patient with L5-S1 right radiculopathy and paraparesis caused by a hemorrhagic synovial cyst.
Case presentation A 62 year old man presented low back and radicular leg pain from one month ago which has caused some falls because of the weakness, even he needed a weelchair to movements. At the physical exploration he presented a bilateral strength of 4/5 at flexion hip, 2/5 at abduction hip, 3/5 at dorsal ankle flexion and 2/5 at first finger extension. The MRI was notice as a big hemorrhagic synovial cyst in right L3-L4 facet joint that cause a several lumbar spinal stenosis so surgery was decided.
Rehabilitation treatment after surgery was really good and the patient walked independently at home until he started with an important right knee pain no related to any trauma. MRI was performed and reported as an extensive medullary bone infarction in tibia bone and a small isquemich no necrotic lesion in distal femur. Nowadays he is using crutches to avoid pain. All the hematological analysis performed has been normal.
Discussion and conclusions Spontaneous hemorrhagiae synovial cyst is a weird condition but should be considered when patients present symptoms of spinal cord compression after sudden back pain because of he importance of an early treatment. We have not found in literature review any relationship between this condition and medullary bone infarction, have we missed anything or it is only a coincidence?

PP173
SPINAL CORD INFARCTION: CASE REPORT AND LITERATURE REVIEW

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Introduction and purpose: Acute spinal cord ischemia syndrome (ASCIS), or spinal cord infarction, is a rare condition, accounting for 1-2% of all stroke admissions and 5% to 8% of acute myelopathies. Several mechanisms can cause impaired perfusion of the spinal cord, and in a few cases no etiology can be found. We present two case reports with ASCIS admitted at our Rehabilitation Department, and compare their clinical features with current literature studies.
Methods and Results/Case description: Two patients with ASCIS were admitted at our Rehabilitation Department. The first one was a 55-year-old women with C8 AIS A sensory-motor tetraplegia after medullar infarction of unknown etiology. The second case is a 58-year-old man who developed a sudden neurologic status of a C6 AIS A sensory-motor tetraplegia, after an heart attack. In both cases the spine MRI identified a medullar lesion of ischemic characteristics. At the urodynamic study they both had a neurogenic bladder with detrusor hypo-activity. After rehabilitation treatment they presented a good functional and neurologic development. At discharge, both patients were independent at daily life activities. The woman walked independently, and the man had need for two canes. The first patient controlled her neurogenic bladder and bowel with diet, scheduled eliminations and stimulating maneuvers. The second was taught to perform intermittent self-catheterization and diet/medication to constipation.
Discussion and conclusions: ASCIS have a wide variety of clinical syndromes, depending on the lesion level and the vascular territory affected. The two presented cases are in concordance with the latest literature findings, with clinical features of an anterior spinal artery syndrome. The recent studies agree that the main prognostic factor is the impairment status at admission, determined by the ASIA scale. Regarding the outcome, they reveal a good functional and neurologic recovery when the patient is submitted to an integrated and holistic rehabilitation program. More studies are required, in order to develop better treatment strategies and better outcomes.

PP174
CREATINE OR VITAMIN D SUPPLEMENTATION IN PERSONS WITH SPINAL CORD INJURY UNDERGOING RESISTANCE TRAINING

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Introduction: A Person with spinal cord injury faces considerable challenges in the performance of important activities of daily living and could benefit from a resistance training to gain muscle strength and improve their functional independence. Supplementation with creatine or vitamin D may be of interest to enhance muscle gains. Creatine supplementation improves muscle strength in general and older population but in persons with spinal cord injury the results are unclear. Vitamin D has been associated with muscle strength however vitamin D deficiency is often present in this population.
Purpose: Determine whether creatine or vitamin D supplementation improves muscle strength in persons with spinal cord injury undergoing resistance training.
Methods: Fourteen inpatients with spinal cord injury, from two rehabilitation centers, were randomized to creatine (3g daily), vitamin D (25000 IU each two weeks) or placebo group in a double-blind design. All participants performed progressive resistance training during eight weeks. The outcome measures, obtained at baseline and after intervention, included: Sum of four skinfolds; Corrected arm muscle area,; Seated medicine ball throw; Handgrip strength with dynamometer; Manual wheelchair slalom test and one repetition maximum for Chest press, Triceps, Pec deck and Lat pull. Vitamin D levels were obtained in all participants before (sixteen participants) and after intervention.
Results: Of those who started the study, 75% had deficit values of vitamin D. The corrected arm muscle area and the medicine ball throw improved significantly ($p<0.05$) in creatine group relatively to the control group. There was a significant correlation ($p<0.05$) between the one repetition maximum Lat pull and levels of vitamin D.
Discussion and conclusions: It is concluded that supplementation with creatine or vitamin D may improve some muscle strength parameters in this population. Vitamin D levels should be analyzed to correct the deficiency situations.

PP175
SPINAL GNATHOSTOMIASIS: A CASE REPORT WITH MRI AND ELECTROPHYSIOLOGIC FINDINGS

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Introduction: Spinal gnathostomiasis results in serious illness and impairments. MRI and serology help in diagnosis however electrophysiologic findings may help in demonstrating the extent of spinal cord function involvement and prognosis.
Methods: A 18-year-old man presented with progressive paraplegia with neurogenic bladder for 2 months. He was referred from a general hospital with a history of progressive numbness and weakness of lower extremities for 3 days. The clinical evaluation, lab, serology, MRI and electrodiagnosis were demonstrated.
Results: Clinical L1 paraplegia signs were examined. The first MRI of TL-spine was revealed. There were longitudinal T2 hypointense lesion along lower thoracic spinal cord, representing track-like hemorrhage with spinal cord edema up to T3 level and no definite enhancement. Repeat TL- spine MRI at 2months after onset showed decreased size of the track-like hemorrhage and spinal cord edema with small size of the T11-T12 spinal cord. Nodular enhancement of the T11-T12 spinal cord and leptomeningeal enhancement along lower thoracic cord surface and enhancing and clumping of cauda equina nerve roots, suggestive of radiculomyelitis. The CSF and serum Gnathostomiasis antibody were positive. Intravenous methylprednisolone and oral Albendazole were given. Three months after treatment, the symptoms improved only in sensation but not in motor function. The electrodiagnosis and MRI (at 5 months after onset) were investigated. There were very small CMAP amplitudes and no response in bilateral tibial and peroneal MNCS respectively. The sural SNCS were normal. The L-spine MEP showed no response. The tibial SEP showed no response in P37, N45. Repeat MRI showed further decreased size of track-like hemorrhage with atrophic change of T11-T12 spinal cord and improvement of radiculomyelitis.
Discussion and conclusions: MRI and electrophysiologic findings were correlated with the clinical of spinal gnathostomiasis patient. MRI demonstrate pathologic findings leading to diagnosis while electrodiagnosis help in demonstrating the extent of spinal cord function involvement and prognosis.

PP176
ACUTE SPINAL VASCULAR ACCIDENT (SVA) IN TWO PATIENTS

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Introduction: Acute spinal vascular accident (SVA) is a rare condition, linked to extended disability. According to the literature, it represents 1-2% of all neurovascular events and 5-8% of all acute myelopathies.
Purpose: The clinical features and functional outcomes of two consecutive patients with SVA, hospitalized in our rehabilitation unit during last year.
Methods: Patient 1: male 37-year-old with spastic paraplegia ASIA B-T11 NLI, due to arteriovenous malformation (AVM), with no concomitant diseases and with progressive onset of muscle weakness for the last three months. Patient 2: 61-year-old female with flaccid ASIA C-T3 NLI paraplegia, due to an undefined SVA. Her history included treated hyperlipidaimia. Early thoracic pain was described five days before the occurrence of lower limb weakness. Both patients underwent MRI and CT-angiography scan, which quantified the lesion extend. Regarding the NLI, no clinical differentiation was observed during inhospital treatment. Furthermore they followed an individualized rehabilitation program based on progressive motor mobilization and occupational therapy. At the end both were wheelchair depended; however patient 1 managed to walk small distance with a walking device.
Results: Severe disability and unfavorable functional prognosis accompany the occurrence of SVA.
Discussion: The performance of non-specific clinical signs before the onset of an SVA, probably defers its early recognition. Clinical examination findings, including the severity of motor or sensory involvement, mainly determine the long-term functional outcome. By now, acute therapeutic interventions are not identified. Tailored rehabilitation treatment seems to be beneficial for post-SVA patients.
Conclusions: Raising awareness on the field of acute SVA, may prove useful for the early diagnosis, treatment and better prognosis of this condition.

PP177
RELATIONSHIP BETWEEN WALKING SYMMETRY AND BALANCE CONTROL IN AMBULATORY PATIENTS WITH SPINAL CORD INJURY

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Introduction: Walking symmetry has been emphasized as an important parameter in many groups of patients with unilateral impairments such as stroke and amputee. On the contrary, ambulatory patients with spinal cord injury (SCI) likely have bilateral impairments and there is no evidence on the importance of this variable in these individuals.
Purpose: This study explored the relationship between walking symmetry and ability of balance control in 16 ambulatory patients with SCI.
Methods: Subjects were assessed for their walking symmetry (step length ratio) while walking along a 10 m walkway at a preferred speed. Their ability of balance control was assessed using the timed up and go test (TUGT).
Results: The average step symmetry of the subjects was 84.58% (95%CI; 75.65:93.51) and average time used for the TUGT was 21.38 s (95%CI; 13.92:28.83). The percents step symmetry had good negative correlation with ability of balance control of the subjects ($r = -0.80$, $p<0.001$).
Discussion and conclusions: The findings confirm the importance of walking symmetry on ability of balance control in ambulatory subjects with SCI. Thus apart from ability of independent walking, rehabilitation professionals may need to emphasize on the improvement of walking symmetry in order to promote safety issue for the patients.

PP178
AMOUNT OF WEIGHT BEARING DURING SIT-TO-STAND IN AMBULATORY PATIENTS WITH SPINAL CORD INJURY WHO WALKED WITH AND WITHOUT A WALKING DEVICE

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Introduction: Sit-to-stand (STS) is a pre-requisite for many other daily activities. To perform independent STS, an individual must be able to take most weight on the legs. Thus, the task is very mechanically demanding. However, there is no evidence on amount of weight bearing during STS in ambulatory individuals with spinal cord injury (SCI) who walked with or without a walking device.
Purpose: This study cross-sectionally compared the amount of weight bearing during STS in 16 subjects with SCI who walked with (6 subjects) or without a walking device (10 subjects).
Methods: All subjects were measured amount of weight bearing during STS (minimum, maximum and average) using a digital load cell for 3 trials/subjects. The findings were analyzed using Mann-Whitney U test with the level of significance at $p < 0.05$.
Result: The amount of maximal weight-bearing during STS of subjects who walked with a walking device was 78% of the body weight whereas that for those who walked without a walking device was 102%. Their maximal ability of body-weight support was significantly different between the groups ($p < 0.05$).
Discussion and conclusions: The momentum occurred while performing the STS task made the levels of weight bearing exceeds amount of body-weight of each individual (102%) who walked without a walking device. Nevertheless, subjects who walked with a walking device could support their body weight significantly less than those who walked without a walking device. Thus, the improvement for amount of body-weight support during STS may help to promote walking ability. In addition, ability of independent STS without hand support may be used as a quantitative target criterion for ability to wean off a walking device of ambulatory patients with SCI.

PP179
SCHEUERMANN'S DISEASE AND SPINAL CORD COMPRESSION: THREE CASES REPORT

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Introduction: We present three cases of patients with Scheuermann's disease and neurological deficit due to spinal cord compression. Scheuermann's disease (juvenile kyphosis dorsalis) is a structural kyphosis of the thoracic spine that occurs commonly in adolescents and characterized by minimal deformity and usually with few symptoms. Neurological complications in Scheuermann's disease are rare.
Purpose: The purpose of our study was to manifest the evolutionary possibilities that may occur in a vertebral dysplasia, to indicate the importance of early detect patients with risk factors and to highlight warning signs of medullary affectation in these patients.
Methods: This is a review of the medical records from 2012 to 2014, evaluating previous and posterior treatments to the neurological involvement.
Results: Our sample included thee patients with ages 14, 24 and 38 at the time of neurological symptoms presentation and kyphosis <60º. Spinal cord compression was due to discal herniation in two of the cases (T11-T12 and T12-L1), and the other one to ostheophytosis (T7-T8). The prevailing symptom was severe pain, paresthesias and in one of the cases sexual dysfunction. In all three cases orthopedic and farmacological treatment, with corticosteroids, was tested with relief in two of them. Surgical evaluation was made in the three cases although only one is awaiting surgery.
Discussion and conclusions: It is interesting that young patients with mature bone structure and moderate hiperkyphosis can present neurological symptomatology/complications. It seems important to follow this patients to monitor the appearance of neurological symptomatology and to question ourselves if we are correctly aproching the conservative management of the hyperkyphosis in early ages.

PP180
SPINAL CORD INJURY WITHOUT RADIOGRAPHIC ABNORMALITY (SCIWORA). A CASE REPORT.

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Introduction: SCIWORA (Spinal Cord Injury Without Radiographic Abnormality) defined as traumatic myelopathy with no radiographic or tomographic signs of spinal fracture or instability was first reported in 1982. SCIWORA mostly affects children although it may also occur in adults with vertebral degenerative changes, such as spinal canal stenosis or spondylosis.
Purpose: We present a case of SCIWORA to remind clinicians about including it in the differential diagnosis of spinal cord injury so they may start the treatment earlier.
Methods: A 16 years old woman endured a cervical trauma. She was initially asymptomatic. Days later she developed quadriparesis, requiring Mechanical Ventilation. A CT scan and plain X-Ray showed no abnormalities. Serial MRI revealed C2-C5 edema and myelomalacia. Supra-aortic arteries angiography demonstrated a discontinuity of the spinal artery (probable thrombosis or dissection). After beginning with steroid, anticoagulant and analgesic treatment, and achieving clinical stabilization she is transferred to a Rehabilitation Centre for multidisciplinary rehabilitation treatment.
Results: At admission the patient had a C1 ASIA B spinal cord injury, requiring fulltime Mechanical Ventilation. After 6 months of treatment she has achieved spontaneous breathing and gait with crutches and AFO. Currently she has a C1 ASIA D injury. SCIM III has varied from 0 to 57.
Discussion: Early diagnosis is essential to reduce the permanent spinal damage and avoid complications. Cervicodorsal MRI is mandatory when a SCIWORA is suspected, with DWI diffusion sequence if is available. SCIWORA is managed conservatively with spinal immovilization and steroid therapy, reserving surgery for special cases.
Conclusions: SCIWORA should be considered in the diagnosis of pediatric age patients with traumatic spinal cord injury, in order to initiate appropriate and early treatment, considering that a mishandling could have dire consequences for the patient and their families.

PP181
SPONTANEOUS SPINAL EPIDURAL HEMATOMA ASSOCIATED WITH ORAL ANTICOAGULATION THERAPY

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Introduction: The spontaneous epidural hematoma is a rare entity that may be associated with spinal cord compression. The etiology may be due to coagulopathies, arteriovenous malformations or oral anticoagulant therapy.
Purpose: We present the case of a patient treated with oral anticoagulant therapy who developed a cervical epidural hematoma.
Clinical case: A 79-year-old patient with history of deep vein thrombosis in treatment with Sintrom, attended the emergency on 23/05/15 because of sudden onset of neck pain accompanied by loss of strength in lower extremities that subsequently progress to tetraparesis.Exploration on admission showed a muscular balance (MB) in upper extremities of 2-3/5 proximally and 0-1/5 distally, lower extremities were globally at 0/5.MRI showed a right posterolateral cervical epidural hematoma from C5 to T1. The patient went under surgery for a laminectomy C5, C6 and C7 and clearing of the epidural hematoma, showing in the first 24 hours slight improvement in upper extremities. The patient began treatment with specific physiotherapy and occupational therapy in our department on 06/03/15. She later continued treatment in Toledo´s National Paraplegics Hospital where she remained admitted for 3 months, showing progressive improvement.Currently the patient presents residual right hemiparesis with a partially functional upper extremity MB of 2-3/5 and lower extremity MB of 4/5 globally, being able to walk independently. Urge incontinence persists.
Discussion and conclusions: The spontaneous epidural hematoma is a rare cause of spinal cord compression, its incidence is one case per million per year (1). There are multiple causes, oral treatment with anticoagulants being one of them. Despite the low incidence, the growing population with oral anticoagulant therapy requires us to know this entity to achieve an early diagnosis and prevent or minimize the serious repercussions that it may present.

PP182
ARACHNOIDITIS CAUSING CAUDA EQUINA SYNDROME FOLLOWING SURGERY

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Introduction: Arachnoiditis, inflammation of the arachnoid membrane and subarachnoid space, surrounding the nerves of the spinal cord can cause adherence of the meninges to the spinal cord. According to the area and extent of the injury symptoms such as numbness, and burning pain may be felt. In other more severe cases, motor function loss, loss of bladder and bowel control can arise due to arachnoiditis. This condition can be caused by a multiple occurrences such as, infection, direct spinal injury, invasive spinal surgery, and chronic compression of the spinal nerves.
Purpose: We report a case of a 48 year old woman who underwent a decompressive surgery, performed for a L4-L5 extruded hernia. Days after the surgery she began to experience dysesthesias, to loose sensivity in her lower hemi-body, lost sphincter control (ability to initiate spontaneous urination). Gait was only compromised by the proprioceptive deficit. Post-operative MRI findings were compatible with arachnoiditis. At admission we reported a neuro-motor status of AIS A paraplegia NN T11, NS T11 on the right NS T10 on the left, NM L5 bilaterally, FIM 100/126. She performed gait with crutches bilaterally, and was still with indwelling catheter.
Methods: We proposed a full and multidisciplinary intensive neuro-rehabilitation program, with urodynamic investigation and sphincter re-education, sexual advising, muscular strengthening of the lower limbs and trunk, gait re-education, maximizing her functional independence.
Results: Patient was admitted in our Rehabilitation Centre, underwent rehabilitive program with improvement in her functional performance.
Discussion and conclusions: The clinical presentations of arachnoiditis are broad and may cause Cauda Equina Syndrome. In this specific case our goals were directed towards the functional independence and Urodinamic and bowel rehabilitation. This case reflects the importance of a multidisciplinary rehabilitation program focused on the various aspects associated with spinal lesion.

PP183
SYSTEMIC COAGULATION PARAMETERS IN PATIENTS WITH SPINAL CORD INJURY

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Introduction: The high risk of venous thromboembolism after spinal cord injury (SCI) results from triggering all three Virchov's factors: slow venous flow, damage of endothelium and coagulopathy .The purpose of this study was to investigate the factors affecting systemic coagulation parameters such as D-dimer, Antithrombin III and platelet count in patients with SCI admitted for inpatient rehabilitation.
Materials and methods: The study involved 53 SCI patients . All the patients had their D-dimer level, Antithrombin III, platelet count and C – reactive protein (CRP) level assessed. The following factors were analyzed: post injury time, ASIA level, and muscle tone (spastic vs. flaccid), body mass index (BMI), the presence of an infection, past and newly diagnosed thromboembolic events. The patients were divided into 3 groups based on their post injury time: up to 6 months (n=34), 6 – 12 months (n=11) and more than 12 months (n=8).
Results: In the up to 6 months group average D-dimer level was 3547 ng/ml, average platelet count 287000 cells/mcL .In the 6 – 12 months group average D-dimer level was 918 ng/ml, average platelet count 238000 cells/mcL .In the above 6 months group average D-dimer level was 473.9 ng/ml, average platelet count 201000 cells/mcL. We found statistically significant correlations between D-dimer level and post injury time, CRP level, platelet count, newly diagnosed deep vein thrombosis, urinary tract infection and muscle tone (flaccid). Platelet count positively correlated with CRP and D-dimer levels. In the up to 6 months group 6 patients were newly diagnosed with thromboembolic complications.
Conclusions: The level of systemic coagulation parameters such as D-dimer and platelet count is significantly higher in the first 6 months post injury than in the later periods. Up to 6 months post spinal cord injury high level of systemic coagulation markers is related to frequent thromboembolic complications (18% of patients).

PP184
HIRAYAMA DISEASE: IS SUCCESS POSSIBLE WITH REHABILITATION?

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Introduction: Hirayama disease (HD) is a rare neurological benign disorder with higher incidence in young Asian males. It's characterized by amyotrophy of a single limb, most commonly involving C7, C8 and T1 innervated muscles. The pathogenesis is attributed towards chronic compression of cervical spinal cord during neck flexion.
Purpose: The authors report one case of HD, followed-up for 1 year after diagnosis, and a review of the literature. 17 year-old male, sent to our consult with recent diagnosis of Hirayama disease, two years after the first symptoms (right hand fatigue and pain). He presented atrophy of the right forearm and hand (half and one centimeter difference 5cm above the wrist and below the elbow, respectively). On muscle strength examination there was deficit on finger flexion (grade 4/5), wrist extension, finger extension and abduction (3/5) and on opposed position (3/5). No other changes were identified in neurological examination.
Methods: Electronic databases, including MEDLINE and PubMed were searched using monomelic amyotrophy and Hirayama disease as key words.
Results: Established treatment options for this disease include cervical collar for mild cases and surgical treatment for refractory cases (most commonly anterior cervical decompression). Reports about physiotherapy management are anecdotal. In the present case, treatment plan consisted of using cervical collar 24 hours daily, and rehabilitation program, including relaxation of cervical flexors, strengthening of the extensors and posture correction exercises. 3 months after beginning treatment the patient felt the disease had stopped progressing. 11 months after the diagnosis, there is already improvement in muscle strength of finger flexion, and asymmetry in forearm perimetry is no longer present.
Discussion and conclusions: Few reports on rehabilitation benefits other than cervical collar have been published. Since there is improvement on the patient's condition, conservative treatment as described appears to be the best choice in this case.

PP185
PARAPLEGIA IN 11- YEAR-OLD CHILD DUE TO SPINAL CORD COMPRESSION: CASE REPORT

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Introduction: Spinal cord compression represents an emergency requiring immediate good evaluation and treatment. Diagnosis is difficult in children.
Purpose: here, we are presenting an 11 years old girl with complete paraplegia due to spinal cord compression whose cause was difficult to specify: tumor? Vascular malformation?
Method:Case report: Upper back pain, weakness and loss of sensation of right lower limb and within a week she could not move her lower limbs at all with sphincter disorders. MRI: vascular malformation facing T1-T2 vertebra but the possibility of a hyper vascular tumor process cannot be eliminated. She was treated by laminectomy, decompression. One week after, she was referred to our Physical and Rehabilitation Medicine department: patient bedridden with complete paraplegia and loss of sensation of right lower limb. Clinical examination: complete neurologic deficit with loss of sensation of lower limbs and sphincter disorders. Treatment: nursing, kinesiology, toxin, orthosis Evolution: right lower limb monoparesis. Hypertonia and hyperreflexia sphincters. Functionally: our patient can walk alone with orthosis.
Discussion: the prognosis of early onset paraplegia is very good but in this case there are some sequelae due to the delay of decompression. Ischemic spinal cord damage in spinal compression is one of worst prognostic factors.
Conclusion Neurological deficiency in children represents an emergency requiring immediate evaluation to analyze the deficit, clarify the different etiologies and initiate emergency treatment to avoid permanent neurological deficit

PP186
THE EFFECTIVE OF PHYSICAL EXERCISE FOR OLDER ADULTS IN FOLLOW-UP THREE YEARS TRACING SURVEY

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Introduction: Continuation of exercise is the most important role to maintain motor functions for community-dwelling older adults. In order to improve motor functions, physical exercise program for older adults have been developed and proposed. These various exercise programs generally consist of the group exercise program or the home exercise program.
Purpose: The purpose of this study was to evaluate the effectiveness of physical exercise program for older adults in follow-up tracing survey during 3 years.
Methods: 147 healthy community-dwelling adults volunteered aged 61 to 85 years to participate in the study. Physical therapists conducted the physical exercise program in every two weeks for 6months. This exercise programs were moderate-to-vigorous intensity in 70-minute. Participants participated in 70-minute exercise every two weeks at the community center and 3 days/week at their home for 6 months. When the physical exercise program was completed, peer-leader managed the physical exercise program in their community. Physical assessments were composed of 10m walking time (MWT), Timed Up and Go test (TUG), one leg standing (OLS), lower extremity strength (LES), and Finger floor distance (FFD). We evaluated these assessments before and after the exercise program, one year, two year, and three year later.
Results: There were significant differences between the data of before and after exercise in MWT, TUG, OLS, FFD ($p < .0001$, $p < .0001$, $p = .012$, $p < .0001$ respectively).Only 23 out of 147 participants continued exercise for three years. The results of one way ANOVA revealed that there were no significant differences in each assessment for 23 participants during three years.
Conclusions: It is very difficult to continue participating exercise program. There were only 23 participants could stay physical exercise program for three years. However once people learn how to exercise by themselves, this physical exercise program contributed to maintain physical abilities.

PP187
CAREER REHABILITATION AND BUSINESS INITIATIVE FACILITATION FOR PERSONS WITH DISABILITY: AN OVERVIEW OF THE GREEK REALITY

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Introduction: The return of a person with acquired disability to their former work status is not always possible. Motor, sensory, cognitive or communication restrictions present new challenges in order to regain their place in the workplace.
Purpose: To establish what career educational programs, employment aids and business initiative facilitations are available for people with disability in practice in Greece.
Methods: Material has been obtained from the website of the Hellenic Work Force Employment Organisation (OAED) and on site from OAED office branches. Additional information regarding secondary facilitations such as transport, childcare, tax exceptions were obtained online.
Results: Two major programs co-funded by the EU were completed by July 2015: A 3 year program of employment aid through subsidies to small businesses for the creation of 2300 new jobs for unemployed persons with disabilities. A second program concerned grants given to 800 people with disability in order to create their own business. Further facilitations include the employment of disabled employees at 5% of the total workforce in large businesses as well as civil service work opportunities. Also there are several educational opportunities available either in the form of seminars or in attending full time university programs.
Discussion: The integration of people with disabilities to the workforce is a key part of their reintegration to society. It is important that society itself embraces and facilitates such initiatives through targeted employment policy.
Conclusions: A number of opportunities for career rehabilitation and educational training are available in Greece, even though the two major employment programs have recently expired. It is important for rehabilitation specialists to be up to date with the current facilitations so as to provide their patients with motivation and a targeted rehabilitation plan.

PP188
BARRIERS TO CARE FOR PATIENTS AFTER THE COMPLETION OF THE REHABILITATION PROGRAM DURING THE LAST TWO YEARS

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Introduction: Frequently, rehabilitation patients need the assistance of another person after the completion of the rehabilitation program with respect to self-care management. However this aid is not always available either due to economic or family reasons. In a previous study that we conducted, this was the case for as many as 10-15% of our patients.
Purpose: To estimate the percentage of the patients that lack family support regarding self-care management after the completion of the rehabilitation program during the last two years.
Materials and methods: In the last two years, a total of 210 patients were hospitalized in our clinic. The distribution pattern of the diseases was as follows: stroke (78), spinal cord injury (33), multiple sclerosis (22), Parkinson's disease (20), amputations (19), other diseases (13). Overall, 136 patients (65%) were partially dependent on another person for their self-care management, while 30 patients (22%) were completely dependent.
Results: Among the partially dependent patients, 116 out of 136 had adequate family support. However, we found that 38 (32%) of them were financially unable to secure assistance of a third person and that 16 patients out of 30 belonging to the completely dependent group (~50%) although all of them except from two had a supporting family environment.
Discussion: Our study underscores the fact that the state needs to reexamine its rehabilitation welfare policy, as it seems that the current model is not sufficiently supportive to families with patients with disabilities. Financial support criteria should not be solely based on the degree of a patients' disability, but the ability of an individual's family to secure a third's person assistance should also be taken into account.
Conclusions: Financial crisis during the last two years had a major negative impact on many families' ability to obtain support from a third person.

PP189
EXPECTATIONS OF PATIENTS ON THEIR ADMISSION TO THE REHABILITATION CLINIC AND LIFE QUALITY ON DISCHARGE, ACCORDING TO THEIR POINT OF VIEW

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Introduction: It is important for rehabilitation patients to fully understand the objectives of treatment. This study aims at evaluating patients' expectations on their admission to the rehabilitation clinic and life quality on discharge.
Materials and methods: The research refers to 38 patients of an average 48 years of age mostly suffering from strokes, spinal cord injury, traumatic brain injury and multiple injuries. A specially designed questionnaire for this research was used to study patients' expectations relative to their physical and mobility problems, self independence, sentimental state, the possibility of socializing and entertaining again and the provision of health facilities. At the same time, quality of life was recorded using the scale SF-12. These two questionnaires were filled in by all patients on their admission to and their discharge from the hospital.
Results: The data show that patients had high expectations when they entered the clinic, which were almost fully satisfied with rehabilitation. The only aspect they seem, to some extent, dissatisfied with is the possibility guaranteed by rehabilitation to return to their work. Moreover, positive results relative to life quality are present, as shown by the progress made during treatment.
Conclusions: This research, which presents rehabilitation from the patients' point of view, demonstrates that the whole process followed is particularly helpful and effective for different parts of patients' lives.

PP190
COMMUNITY DEMOGRAPHICS, SOCIOECONOMIC AND HEALTH STATUS AMONG OLDER JAPANESE LIVING IN NEW SOUTH WALES, AUSTRALIA

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Introduction and purpose: The 2011 Census showed that 1 in 4 Australian residents were born overseas and 1 in 5 spoke a language other than English at home. Although the health status of migrants vary depending on birthplace, age and socioeconomic factors, there may be social disadvantages and/or migration related health inequalities in older residents with culturally and linguistically diverse backgrounds. The Census in 2011 recorded 12,108 Japanese-born people in New South Wales (NSW). To further document the needs of this population, this study aimed to record demographic and socioeconomic characteristics, and to examine health conditions and the functional capacity of Japanese aged 60 years and over living in NSW.
Methods: Combined methods were used for the recruitment of participants in NSW. Ethno-specific social clubs, Japanese general practitioners and rehabilitation colleagues were approached. Participants were also recruited through paper and electronic Japanese community magazines, and during an aged care seminar for older Japanese held in Sydney. A questionnaire was developed in Japanese. Participants were asked to return the questionnaire by post. Simple descriptive statistics were used.
Results: Eighty-two respondents completed the questionnaire with the mean age of 70.5 years old (range 60-85). Of these, 14 were living alone and 23 reported that their level of English was not fluent. The majority of respondents (74.4%) had been living in Australia for more than 20 years. Thirty-seven respondents (45.1%) were found to have a history of chronic disease(s). Reduced strength or impaired balance was reported in 52 respondents. Fifteen had a fall in the last 12 months. Only 1 respondent required assistance for self- care and 8 respondents needed help or support for domestic chores.
Conclusions: Overall, older Japanese residents in this study demonstrated good function. Further study is needed to develop an interventional program in order to maintain their functional independence.

PP191
LOWERING BARRIERS TO HEALTH LITERACY IN OLDER MIGRANTS: EDUCATING ON HEALTH AND AGED CARE SERVICES FOR THE JAPANESE COMMUNITY IN AUSTRALIA

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Introduction and purpose: The Australian population is culturally and linguistically diverse (CALD), with 26% of the Australian residents were born overseas. Although health information in the more common languages and free interpreter services are available, older migrants who belong to minority groups may have low health literacy. According to the Census in 2011, there were 35,378 Japan-born people in Australia, which is a 14.9% increase from the 2006 Census. Of these, approximately 1900 people (5.4%) were aged 65 years and over, and this population is likely to increase over time. In order to educate this population about health and aged care services in Japan and Australia, seminars were presented.
Methods: Japanese residents aged 60 years and over and living in the Sydney region were invited to the seminar via ethno-specific social clubs, paper and electronic based Japanese community magazines and Japanese general practitioners. All seminars were presented in the Japanese language by ethnically Japanese professionals and were free of charge.
Results: Due to popularity, the same seminar was presented twice with the assistance of volunteers. In total, 81 people attended the seminars and provided very positive feedback. A variety of requests for further information in future seminars were received from the attendees.
Conclusions: Japanese language seminars on health and aged care services were well received by older Japanese residents living in Sydney. Barriers to health literacy can be usefully explored by people who have the same CALD backgrounds.

PP192
TELEMEDICINE PLATFORM FOR THE COMPREHENSIVE MANAGEMENT OF UPPER LIMB LYMPHEDEMA AFTER BREAST CANCER

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Introduction: Lymphedema is a potential side effect of breast cancer surgery and radiation therapy that causes severe physical and psychological morbidity.The Authors and the Institute Ramón y Cajal for Health Research (IRYCIS) have developed an online platform for comprehensive management of upper lymphedema after breast cancer, including its early detection, a practical-theoretical training and the possibility of contact with the specialist for quick reference doubts and new symptoms.This tool would avoid unnecessary visits, shorten waiting lists, increase patient adherence to treatment and improve early diagnosis.
Materials and methods: The prototype software and website have been developed by a multidisciplinary team formed by highly experienced rehabilitators, physiotherapists and computer engineers. The developed tool consists of a platform with educational content, including exercises, videos, and guidelines to monitor for signs and early symptoms of adverse effects. The therapy can be monitored by doctors and physiotherapists through the application, using a webcam or Kinect. This direct communication channel will also facilitate early diagnosis of new case. Telemedicine brings the possibility to assess, diagnose and monitor patients' therapy without the need of face-to-face consultation. This option allows patients to choose the place and time for their therapy, avoiding absenteeism. The use of the telemedicine system could be extended to other centers or institutions. In addition, it could be used for the management of lower limb lymphedema secondary to cancer processes (vulvar cancer, ovarian cancer, melanoma and prostate cancer).
Conclusions: Access to contents of this website is the best way to prevent the onset, complications and disability associated with lymphedema. This tool aims to be fast and convenient application to provide information about lymphedema, prevention, treatment and be a rapid doctor-patient communication. Stage of development: Software and website prototype available.

PP193

RETURN TO WORK FOR SEVERE MOTOR DEFICITS PATIENTS: AN EDUCATION, PREPARATION AND ACTIVATION INTERVENTION FOR REHABILITATION TEAM MEMBERS

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Introduction: One of the main objectives of the rehabilitation team members for the patients with severe motor deficits (such as those with Stroke, Spinal Cord Injury or Traumatic Brain Injury) is the social reintegration, especially the return to work through employment or entrepreneurship. The role of the rehabilitation team can be decisive.

Materials and methods: The training, preparation and activation of members of the rehabilitation team such as Physiatrists, nurses, occupational therapists, psychologists etc, on issues related to the abilities and skills for employment with emphasis placed on entrepreneurship aims is to equip them with the necessary knowledge and enable them to provide the appropriate stimulus and incentive to patients. Proposed training modules will include: a) analysis of the patient's abilities and skills, b) the necessity of work, c) ability to create a new perspective (employment, entrepreneurship & e-entrepreneurship), e) create lasting motivation d) ways to integrate these into daily contact with the rehabilitation team. Besides the benefits that this initiative provides to patients, it és of major importance in relation to the educational process of hospitalized patients in order to recognize their opportunities and the available alternatives in terms of their return to work suited to their needs and capabilities.

Results: The proposed intervention should be included in the basic education of patients with severe motor deficit during hospitalization, providing an additional incentive to the fundamental objective of rehabilitation: the social and professional reintegration. Its aims is to help introduce possible prospects for employment, entrepreneurship and innovation for people with disabilities.

Conclusions: This proposed intervention can provide patients during their hospitalization with a strong incentive employment entrepreneurship and innovative tools while at the same time meeting other recovery objectives.

PP194
DISTAL FOREARM REPLANTATION REHABILITATION: A CASE REPORT

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Introduction: The traumatic amputations of distal forearm are quite frequent and can result in significant functional impairment and cosmetic deformation, which can generate social isolation and permanent disability. The epidemiological data of distal forearm replantation are sparse. The best aesthetic and functional results following distal amputation of a segment are achieved with the replantation surgery. The fundamental factors that determine the success of replantation include the protection of the amputated segment, the mechanism of trauma and the emergency care. Absolute indications for replantation are lesions in children, thumb amputation, pluridigital amputations and amputations in palm-level, wrist level or proximal to wrist.
Purpose: this work consists of a case report presentation of distal forearm replantation rehabilitation.
Case report: 56 year-old male patient, carpenter by profession, right-handed, suffered a partial amputation of right wrist and hand at carpal-metacarpal level following domestic accident with saw blade. The patient underwent distal forearm replantation in anatomical position. In the examination of post-surgery observation, the patient presented hypoesthesia in the distribution of radial and median nerves and in physical examination was noticed thenar and hypothenar atrophy, decreased range of motion (ROM) of right wrist and hand and cannot perform hand gripping and digit-digital calipers, presenting a severe disability of the hand. It is proposed rehabilitation program with physical and occupational therapy. Four months later, the patient presents increase in ROM of wrist and hand and a more functional hand.
Discussion and conclusions: The main objective of the rehabilitation program after distal forearm replantation is to recover functional capacity. The causes of unsatisfactory results are often due to the late start of mobilization of replanted member, which leads to articular adhesions and joint limitations. Early physical therapy plays an important role in obtaining better functional results in distal forearm replantation.

PP195
A 3-DIMENSIONAL RECONSTRUCTION OF THIGH MUSCULATURE IN MRI OF TRANSFEMORAL AMPUTEE

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Introduction and purpose: We investigated the feasibility of 3-dimensional (3D) reconstruction of each thigh muscle in magnetic resonance imaging (MRI) taken in transfemoral amputee, which can be effectively used for dynamic electromyography (EMG) recording within lower limb prosthesis.
Methods: Bilateral thigh MRI was taken in transfemoral amputee with informed consent. First, we reconstructed entire thigh musculature as a whole in a 3-dimension by using commercialized software (Mimics®, Belgium). And then, each thigh muscle was drawn according to the region of interest, and visually reconstructed.
Results: Thigh muscles, quadriceps and hamstring groups, were separately reconstructed. We observed the derangement of muscular geometry near the stump, compared to the normal arrangement in contralateral thigh. The insertion of each thigh muscle depends on the surgical procedure during amputation. Approximated muscle volume of amputated thigh was significantly lower than that of contralateral thigh, which was probably caused by disuse atrophy.
Discussion and conclusions: This is the first study that showed a 3-dimensional reconstruction of thigh musculature in MRI of transfemoral amputee, which is a feasible and useful method. It will be needed in future studies to position dynamic EMG sensors accurately in remaining thigh muscles to control the prosthesis properly.

PP196
HIP DISARTICULATION AND PROSTHETIC FITTING IN A PATIENT WITH NECROTIZING FASCIITIS

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Introduction: Necrotizing fasciitis can cause septic shock and limb amputation. It's an acute infection of the subcutaneous adipose tissue and fascia, producing tissue necrosis and severe systemic compromise.
Purpose: We present the clinical case of a 63 year-old male patient
Methods: He consulted in the emergency room with intense pain on his right calf for 24 hours, an erythematous plaque extending from his calf to his thigh, swelling, functional limitation and fever. Lesions spread rapidly and quickly developed metabolic lactic acidosis and acute renal failure, therefore he got admitted in the Intensive Care Unit (ICU). Physical exploration showed an erythematous lesion from his calf to his thigh, with necrotic areas, purulent exudation and epidermolysis. CT of the lower limbs showed intense swelling of the posterior compartment and subcutaneous adipose tissue of the right lower limb, thickened fascia, free liquid in fascia and muscles and air bubbles. All these findings were compatible with necrotizing fasciitis.
Results:Treatment was initiated with wide-spectre antibiotics, but the lesions and the general condition continued to worsen. Therefore, after 12 hours, urgent hip disarticulation was performed. Microbiological analysis: was Streptococcus pyogenes. Surgical wound progressed favourably, so it was possible to perform a transposition of muscle rectus abdomini to the amputation space. Afterwards, he begun physiotherapy, achieving independent transference from sitting to standing and monopodal gait with a walker. Favourable evolution, we started the prosthetic fitting process. Along with the orthopaedic technician, we adapted a Canadian hip disarticulation prosthesis, with a pelvic bucket; blocked-single-axis hip; weight-activated friction, single-axis knee, for added stance security, and a single-axis articulated foot.
Conclusions: Global mortality of necrotizing fasciitis is 20-47%. Lower limb amputation is necessary in 20% of cases. The Canadian hip disarticulation prosthesis is a good alternative in hemipelvectomy, hip disarticulation and transfemoral amputation with a short stump.

PP197
VAN NES ROTATION-PLASTY IN A PAEDIATRIC PATIENT – A REHABILITATION CHALLENGE

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Proximal focal femoral deficiency (PFFD) is a rare congenital anomaly, with no known cause, characterized by failure of normal proximal femur and hip joint development which manifests as hypoplasia or absence of the proximal femur. Children often have associated instability of the hip and rotational misalignment, poor hip musculature, contractures involving the hip and leg length discrepancy. Current management strategies aimed at improving functional ambulation are largely dependend on the degree of femoral shortening and the status of the hip and knee joint. Van Nes rotation-plasty has been used for patients with congenital PFFD: the lower limb is rotated to use the ankle and foot as a functional knee joint within prosthesis. We report a clinical case of a paediatric patient with PFFD, submitted to Van Nes rotation-plasty, and rehabilitation program. The authors present a clinical case of a male adolescent, 14 year-old, with PFFD. The patient did not develop the proximal femur (femoral head, trochanters) and showed a markedly dysplastic acetabulum; the femoral shaft was also short. To compensate the patient used an extension prosthesis. The patient underwent a Van Nes rotation-plasty in which the lower leg and foot were rotated 180º allowing the ankle joint to replace the knee joint and placed in an intensive rehabilitation programme in preparation for a new prosthesis. The Van Nes rotation-plasty is a challenge in physiatry. There is limited literature supporting treatment options. In this poster we review the programme used, the functional limitations after the procedure and aspects to improve treatment in the future.

PP198
WHICH IS THE BEST WAY TO PERFORM THE PHYSIOLOGICAL COST INDEX IN UNILATERAL TRANS-TIBIAL AMPUTEES?

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Introduction Motor impairments frequently result in increased walking energy expenditure. Lower-limb amputees represent a particular group as they spend more energy compared to the healthy ones. Although oxygen consumption measurements (VO_2) are the primary choice for assessing the energy cost of walking (ECW), they are cumbersome, expensive and require trained personnel. For estimating energy expenditure the Physiological Cost Index (PCI) has been used, which uses heart rate (HR) as an indicator of energy cost.
Purpose The aim of our study was to evaluate the reliability and validity of PCI in relation to ECW in unilateral transtibial amputees (TTAs).
Methods 66 TTAs performed a 6 minute walking test (6MWT) in three different conditions: on the floor (FWT) in a hallway with a regular surface walking back and forth at comfortable self-selected speed and on a treadmill in two different slopes: at 0% and 12% (TWT0%, TWT12%), with the speed indicator covered. The time length of the 6MWT was enough to reach the steady state phase (SSP) of cardiac and metabolic data, which were collected with a gas analyzer. The ECW and PCI data of each patient during the three conditions were calculated and a Pearson's correlation coefficient (R) was computed between ECW and PCI.
Results Pearson's correlation for FWT and TWT0% (R=0.182) was not significant. For TWT12% R=0.336 was statistically significant. To evaluate the concurrent validity of PCI in TTAs the percentage change with respect to baseline was computed for the ECW and PCI for TWT0% and TWT+12% with R=0.558 which was significant and showed a positive correlation between the two.
Discussion and conclusions ECW remains the gold standard but PCI can be used and is reliable as an alternative measure when the subject performs a submaximal exercise, like walking on a treadmill with 12% inclination.

PP199

QUALITY OF LIFE AND FUNCTIONALITY OF PATIENTS WITH ACQUIRED UPPER LIMB AMPUTATIONS TREATED AT DISABLED CHILD ASSISTANCE ASSOCIATION -AACD- SãO PAULO- BRAZIL

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Introduction: Rehabilitation of individuals who have undergone upper limb amputations is a challenging and the aim of treatment is to promote independence in ADL, with or without prostheses.
Purpose: evaluate the quality of life and functionality of patients with acquired upper limb amputations treated at a rehabilitation center.
Methods: retrospective and cross-sectional study with 39 patients who answered the questionnaire, which included items related to general characteristics, amputation, rehabilitation, activities of daily living, occupation, driving and pain in the stump. Beck Anxiety and Depression Inventory were applied. Fisher's statistical test and logistic regression were applied; confidence interval for mean of 95% and P-value < 0,05 were used.
Results: Of the 39 patients, 76.9% were male, 87.2% had traumatic amputation, 87.2% had unilateral amputation and 48.7% received a prosthesis. 47.4% abandoned their prosthesis and 52.6% were dissatisfied with the prosthesis.
Discussion: The patients had greater difficulty in performing ADL with the prosthesis. The degree of satisfaction for ADL and the presence of pain were not related to work, prosthesis and anxiety or depression.
Conclusions: The use of upper limb prostheses hampered the performance of activities of daily living for patients and most were dissatisfied with the prosthesis. Despite this, most patients were satisfied with their ability to perform ADL.

PP200
CARDIAC REHABILITATION AFTER HEART VALVE SURGERY; RESULTS AND QUALITY OF LIFE IN A 40 PATIENTS' SAMPLE

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Introduction: The rehabilitation programmes following heart valve surgery have been documented as being as effective as those after coronary artery surgery. Studies of the results and problems of the cardiac rehabilitation programmes (CRP) in this population are limited.
Purpose: We aimed to study the characteristics and functional outcomes in post heart valve surgery patients after an 8 weeks CRP.
Methods: A group of 40 patients were referred to an 8 weeks outpatient Cardiac Rehabilitation programme following heart valve surgery after being discharged from the hospital. The programme included physical training, educational sessions and psychological therapy and support. We developed a multidimensional assessment tool to evaluate their clinical, functional, and psychological status as well as their comorbidities and quality of life(SF36 scale) during and after the CRP.
Results: The majority of the patients were male (60%). On admission to rehabilitation, most of the patients (75%) had moderate to severe functional impairment and a moderate grade of dependence for basic activities of daily living. One –third of the patients suffered significant clinical complications during their hospital stay. After the 8 weeks CRP, all of them improved their functional status, autonomy and quality of life and the majority of patients(95%) continued to live independently.
Discussion and conclusions: Patients referred for a CRP after heart valve surgery are often frail, with an significant grade of functional impairment and risk of clinical complications. During and after a rehabilitation programme, most patients showed significant improvement in their functional status, autonomy and quality of life, which remains stable in the majority of subjects during short-term follow–up. Hence multidisciplinary rehabilitation programme should be made available for all patients undergoing heart valve surgery.

PP201

A NEW PROTOCOL TO EVALUATE THE AUTONOMIC BALANCE IN PATIENTS WITH PERIPHERAL ARTERIAL DISEASE

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Introduction: Heart rate variability (HRV) is a noninvasive method that provides information about autonomic balance related to cardiovascular health. Gait variability (GV) is a property of healthy gait and it reflects the complexity of control mechanisms.A combination of both methods can be useful to assess claudication in patients with peripheral arterial disease (PAD).
Purpose: To propose a protocol to analyze the autonomic balance in PAD patients through the combined analysis of HRV and GV.
Methods: We did a pilot study with one healthy subject (age 50 years old;weight 96,8 kg;height 185 cm;body mass index 28,28).The protocol was as follows:1)Ankle-brachial index (ABI) test as a screening tool.2) HRV recording during 15 minutes at rest in supine position. SDNN, rMSSD and pNN50 were the variables in the time domine; Poincaré Plot (SD1,SD2 and Stres Score); Approximate Entropy (ApEn) and Sample Entropy (SampEn) were the nonlinear variables.3)GV in two experimental conditions:walking on the ground at their self-determined usual paces around an open circle circuit and then on a treadmill at the same pace. Both for 10 minutes or until claudication.Stride interval time series was captured using a simple electronic push-button mounted in the heel of an insole placed in both running shoes.The stride standard deviation (SSD), rMSSD, Sample Entropy (SampEn) were calculated for the whole cicle and the flight and support phases.
Results: In this healthy subject, ABI was normal as well as HRV parameters showing an adequate autonomic balance at rest. The subject completed both 10 min tests and GV showed a hight level of complexity as expected for a healthy gait.
Discussion: We expect to find in PAD patients an altered ABI;a sympathetic predominance in HRV at rest;a limitation of time in walking tests by claudication; a loss of complexity in GV.
Conclusions: This protocol can be useful to assess claudication in PAD patients.

PP202
THE INFLUENCE OF THE CARDIAC REHABILITATION ON THE PATIENTS AFTER MYOCARDIAL INFRACTION

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Introduction Infarctus cordis (lac. infarctus myocardii), is also called coronary attack and heart attack. Namely, it is a cardiac muscle necrosis caused by its malperfusion which is the result of coronary artery occlusion, its main goal is to supply blood to the heart.
Purpose The assessment of the physical exercise capacity after the myocardial infarction while two-week cardiac rehabilitation.
Methods The research was in Hospital among 56 patients (36 men and 14 women) aged 55±11,9 who were undergoing conservative treatment after infarctus cordis. They underwent exercise cardiac stress test (according to Bruce protocol assessed in MET) both on the day of their admission to the ward and on the day of hospital discharge in order to get the difference in their exertion (improvement / deterioration). During their hospital stay, they underwent interval training on even days and circuit training on odd days.
Results The patients were divided into 4 groups according to obtained results: I group (0 MET) 2 people – 1 man and 1 woman; II group (0,1 – 2,4 MET) 16 patients – 4 women and 12 men; III group (2,5-4,5 MET) 28 people – 10 women and 18 men; IV group (4,6-7 MET) 10 patients – 2 women and 8 men. The time of physical exertion increased at the average of 3'30'. Pulse rate (measured – admission/discharge) was -24±20. It is also worth considering that 85,7% of patients smoke (10-20 cigarettes a day) and 20,8% of them drink alcohol.
Discussion and conclusions Only 2 patients did not improve and 28 patients are in Group III and they considerably improved. The pulse rate is also important. It was higher at the day of discharge but it still corresponded to normal exertion heart rate and the patients did not complain of ailments they had had at the day of admission.

PP203
ANALYSIS ECHOCARDIOGRAPHIC OF ELDERLY UNDERGOING CABG AND CARDIOVASCULAR REHABILITATION

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Introduction: The acute myocardial infarction generates hypertrophy and fibrosis. The Cardiovascular Rehabilitation (CVR) clinically improves cardiac patient. Echocardiography analyzes the evolution of pathophysiological or physiological adaptive mechanisms.
Purpose: To relate CVR with Echocardiography in elderly men with (coronary artery bypass graft) CABG.
Methods: Cross-sectional descriptive study to Echocardiographic evaluation of 20 elderly men with middle age of 69.0 ± 6.45 year and CVR participants of the program during average period of 4.15 ± 1.63 years.
Results: Participants had showed body mass index (24.86 ± 3.9); Initial left ventricular end-diastolic diameter (55.35 ± 6.65) and final (57.65 ± 7.26) (p = 0.05); Posterior wall of initial left ventricular (9.05 ± 1.23) and final (8.00 ± 1.00) (p = 0.07); Initial left ventricular mass (232.35 ± 55.46) and final (219.55 ± 61.43) (p = 0.10); left ventricular ejection fraction in the initial percentage (59.40 ± 10.71) and final (61.67 ± 12.64); Relative to the initial thickness ratio left ventricular (0.33 ± 0.07) and final (0.29 ± 0.04) (p = 0.02); the subjects had significant improvement in the index of relative thickness of the left ventricle ratio to initial left ventricle (0.33 ± 0.07) and final (0.29 ± 0.04) (p = 0.02) (Reference value (RV) ≤ 0.42) and index of left ventricular mass for the initial body surface area (135.89 ± 15.67) and final (116.61 ± 29.80) (p = 0.006) (Men for RV ≤ 115), showing a statistically significant decrease after CVR.
Discussion and conclusions: The decline in values showed in the echocardiographic parameters between the start and the end of CVR indicate a positive ventricular remodeling, with the output of a pathological ventricular remodeling pattern for a trend to normalcy.

PP204

THE USE OF CONTROLLED PHYSICAL TRAINING IN PATIENTS WITH ACUTE CORONARY SYNDROME TREATED WITH INTERVENTION – ASSESSMENT OF EFFECTS ON BIOCHEMICAL PARAMETERS AND FUNCTIONAL MYOCARDIAL

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Introduction: Diseases of the cardiovascular system are a major cause of disability and impaired quality of life for seniors, as well as a serious economic problem in health care. Important role in the prevention of cardiovascular disease plays making systematic physical activity, which is a component of any rehabilitation program.
Purpose: The aim of this study was to evaluate the effect of controlled exercise on selected biochemical parameters and functional myocardial infarction.
Methods: A group of 89 patients were divided into 3 subgroups. In group I (n = 30) was performed 2 weeks cardiac rehabilitation program, in group II (n = 30) 4 weekly. Streamline the program consisted of a series of interval training performed using a bicycle ergometer and general conditioning exercises. The remaining group (gr. III, n = 29) participated in individually selected training program. In all subjects before and after the training cycle underwent thoracic impedance plethysmography, also determined the level of plasma natriuretic peptide NT-proBNP and echocardiography and exercise test.
Results: After training, in groups, which carried out a controlled physical training, improvement was observed: exercise capacity of patients respectively in Group I (p = 0.0003), Group II (p = 0.0001) and GR.III (p = 0.032), stroke volume SV, cardiac output CO and global myocardial contractility, there was also reduction in the concentration of natriuretic peptide NT-proBNP. Furthermore, the correlation between the results shown plethysmography parameters and NT-proBNP, SV, CO and EF.
Discussion and conclusions: Regular physical training as part of the cardiac rehabilitation has a beneficial effect on biochemical parameters and functional myocardial infarction in patients with ACS. Size of the observed changes conditioned by the nature and duration of the training.

PP205
EVALUATION OF CHANGES IN THE CENTRAL AND PERIPHERAL CIRCULATORY SYSTEM UNDER THE INFLUENCE OF PHYSICAL TRAINING CARRIED OUT UNDER THE STANDARD PROCEDURE OF IMPROVING PATIENTS AFTER ACUTE CORONARY SYNDROME

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Introduction. The observed with age, atherosclerotic changes in vessels and increasing damage to the vascular endothelium, causing an increase in the occurrence of cardiovascular events. An important element in the rehabilitation of patients with coronary artery disease is a physical activity, to complement the pharmacological treatment.
Purpose. The aim of the study was to evaluate the influence of a controlled exercise training on changes in central and peripheral circulatory system in patients after acute coronary syndrome.
Methods. Group comprising 92 patients were divided into three subgroups. The rehabilitation period ranged from 2 to 4 weeks. In group I and II performed a series of interval training on a bicycle ergometer supplemented by general conditioning exercises; in the group III training individually tailored program, consisting of breathing exercises, relaxation and small muscle groups. In all groups, before and after the training cycle test was performed impedance plethysmography of the chest, echocardiography, exercise test.
Results. After completing the program, the parameters plethysmography improved in all groups, with the largest changes were observed in the group treated to the longest training: increase PAmpl (pulse wave amplitude) of 16.7% and PSlope (systolic slope) of 17.6%, while decline in the value of CT (crest time) by 5.7% and PT (propagation time) by 6.3%. In groups, which carried out a controlled exercise training have improved as well: exercise capacity of patients, stroke volume SV, cardiac output CO and global myocardial contractility EF. Moreover, a correlation between the results plethysmography parameters and SV, CO and EF.
Discussion and conclusions. Controlled physical training, which comes under the standard procedure rehabilitation of patients after acute coronary syndrome, leads to better blood perfusion in vessels of the legs and improve myocardial functional parameters, thereby affecting the growth of physical capacity of patients.

PP206
COMPARISON OF CARDIAC FUNCTION AFTER CARDIAC REHABILITATION BETWEEN RECOVERY AND NO-RECOVERY GROUP OF SEXUAL ACTIVITY

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Introduction: Sexual health is an important quality-of-life concern for the patients with acute myocardial infarction (AMI) in cardiac rehabilitation (CR). But, there are few studies yet on change of cardiac function after CR about sexual recovery.
Purpose: To compare the change of cardiac function in male patients with AMI with or without sexual recovery after CR.
Methods: Among 183 male patients with AMI who participated in CR from February 2013 to May 2015, 70 subjects were finally enrolled. Subjects who answered a questionnaire about sexual activity at start point and endpoint of CR, showed usual sexual activity before AMI and decreased sexual activity at start point of CR. Information on socio-demographic characteristics and cardiac function obtained at start point and endpoint of CR was used for analysis. The data was analyzed through Independent t-test and ANCOVA to compare between the groups.
Results: 1) Twenty-two of 70 subjects has improved sexual activity after CR, but 48 of them were continued the status of decreased sexual activity after CR. 2) At start point of CR, age (p=0.005), body weight (p=0.007), body mass index (BMI) (p=0.007), dyslipidemia (p=0.003), statin (p=0.018) and heart rate (HR) after recovery (p=0.036) were significantly different between both groups. 3) Both change of HRrest (p=0.001) and HRmax (p=0.023) were independently and positively associated with sexual recovery after adjustment for other factors.
Discussion and conclusions: Male patients with AMI with sexual recovery showed a lot of change of HRrest and HRmax during ETT after CR than patients without sexual recovery. Age, body weight, BMI, dyslipidemia and statin were significantly different the groups in this study. Improvement of capability of more higher intensity training by HR seems to be associated with sexual recovery after CR. These points would have to be considered when educating patients under CR about sexual activity.

PP207
HEART RATE VARIABILITY IN INTERMITTENT CLAUDICATION

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Introduction Peripheral arterial disease is a chronic disorder which affects blood flow to lower limbs. Due to a late diagnosis of the disease or a lack of medical care, many patients can develop a pathology called intermittent claudication (IC). IC patients suffer a decrease of blood flow to lower limbs, being impossible for them walking short distances without feeling pain or stopping the gait. Heart Rate Variability (HRV) is a non-invasive feasible tool for determining cardiovascular function; so it could be helpful for a better understanding of IC.
Purpose The purpose of the study was to investigate whether HRV could be a marker of the state of the disease in IC.
Methods14 control male subjects (60±5 years) and 14 male claudicants (age 64±6 years) underwent 10 minutes of HRV analysis following the guidelines for HRV assessment exposed in the literature. In order to get double feedback from this research, the study selected one HRV linear parameter (RMSSD) and one nonlinear parameter (SampEn). Due to the non-normal statistical distribution of the sample, the study performed Mann-Whitney test for comparison of HRV parameters in controls vs claudicants.
Results There were no differences between controls and claudicants in RMSSD (p= 0.41) or SampEn (p= 0.73) neither. Controls showed similar RMSSD to claudicants: 24.39±8.52 ms vs 24.92±23.5 ms. Moreover, the results in terms of SampEn were similar to those related to RMSSD, being 1.27±0.26 the value for controls and 1.21±0.36 the value for claudicants.
Discussion and conclusions HRV is not a valid method for researching the state of the disease in IC. The sensibility of HRV methods is not enough accurate for detecting differences between controls and claudicants. Despite HRV is recommended for screening cardiovascular diseases, we conclude that it does not provide useful information in IC.

PP208
SUSTAINABILITY OF CARDIOPULMONARY EXERCISE CAPACITY AND OBESITY INDEX BETWEEN CENTER AND HOME BASED CARDIAC REHABILITATION

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Introduction: Until now, there has been controversy which one is better between the center-based and the home-based cardiac rehabilitation (CR) programs in patients with acute myocardial infarction (AMI).
Purpose: We aimed to compare the center-based CR program and the home-based CR program in terms of sustainability of the improvement on cardiopulmonary exercise capacity and fat-free mass index (FFMI).
Methods: Among 331 AMI patients referred for CR after percutaneous coronary intervention (PCI) from October 2010 to September 2012, 48 patients were finally analyzed. Subjects who met all the following criteria were included: 1) the patients who underwent exercise tolerance test (ETT) by modified Bruce protocol at 3 assessment points – before the initiation of phase II CR, after completion of 1-month phase II CR, and 6 months after the initiation of phase II CR; 2) the patients with mild to moderate risk (Ejection Fraction > 40%). The center-based CR group participated in 4-weeks regular aerobic exercise training with ECG monitoring in the hospital. Home-based CR group underwent self exercise training. We measured maximal oxygen consumption (VO2max) and fat free mass index(FFMI).
Results: 1) 19 participated in the center-based CR and 29 patients participated in the home-based CR. 2) Both groups showed significant improvement of VO2max after 1 month. 3) At 6 months follow-up, VO2max was maintained in the center-based CR group, while dwindled in the home-based CR group. 4) Unlike the result of VO2max, only center-based CR group showed significant improvement of FFMI. And there was no significant change of FFMI at 6 months follow up.
Discussion and conclusions: In comparison with the home-based CR, the center-based CR is more favorable for AMI patient in sustaining the improvement of exercise capacity. Significant improvement of FFMI was seen only in the center-based CR and it was sustained at 6 months follow up.

PP209
PERCUTANEOUS POSTERIOR TIBIAL NERVE STIMULATION IN THE TREATMENT OF CHRONIC PELVIC PAIN SYNDROME: A LITERATURE REVIEW

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Introduction: Chronic pelvic pain syndrome (CPPS) has been treated with several different interventions with limited success. Percutaneous Posterior Tibial Nerve Stimulation (PTNS) is a lower urinary tract neuromodulation technique that has been used for the treatment of urgency urinary incontinence. PTNS has also been shown to have positive effects on CPPS.
Purpose: In our PRM department, we use PTNS in patients with urinary urgency incontinence with good results; so, we performed a literature review in order to assess the efficacy of PTNS in CPPS.
Methods: Bibliographic research on Pubmed and Google scholar databases was performed with the query "posterior tibial nerve stimulation AND chronic pelvic pain". We included 16 articles in this review.
Results: One RCT (n=89) showed a significant improvement (≥50%) on pain after 12 weeks of PTNS based on VAS (40%) and on NIH-CPSI (66.6%). Another RCT (n=33) that referred a weekly treatment during 12 weeks had assessed VAS, SF-MPQ and SF-36 scores before PTNS, at 12th week and at 6th month, reported a significant improvement in all scales with continuing effects at the 6th month, with 12.5% of the patients being cured. Other small prospective studies indicated a significant improvement in VAS and SF-36 after PTNS. Systematic reviews performed in order to determine the efficacy of PTNS, showed as limitations of the studies, the few number of RCTs as well as the non-standardization of analysed outcomes. A meta-analysis that review all trials reporting on therapeutic intervention for CPPS, found that PTNS produce statistically significant reductions in NIH-CPSI. Major adverse effects were not reported, only slight pain and bruises.
Discussion and conclusions: The articles found demonstrated that PTNS may relieve pain in patients with CPPS, being a safe intervention. Independent high quality RCTs are necessary in order to confirm the therapeutic effects of PTNS in CPPS.

PP210
NEUROGENIC BLADDER WITH VESICOURETERAL REFLUX IN GUILLAIN–BARRÉ SYNDROME: A CASE REPORT

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Introduction: Guillain–Barré syndrome (GBS) is an acute-onset, monophasic, immune-mediated polyneuropathy that often follows an antecedent infection. The term Guillain–Barré syndrome defines a clinical entity that is characterized by rapidly progressing, limb weakness and the loss of tendon reflex. Bladder dysfunction may occur in the early stage and require bladder catheterization. In general, long-term urological dysfunction is uncommon and urological complications, especially vesicoureteral reflux is hard to see. Here, we report a case of Guillain–Barré syndrome patient with neurogenic bladder and vesicoureteral reflux in early stage

Case Report: A 64-year-old male patient presented with left leg weakness and hypesthesia, voiding difficulty, diarrhea. He was diagnosed with Guillain–Barré syndrome by clinical findings and electrodiagnostic testing, et al He has been treated with steroid and immunoglobulin for about 2 months, but voiding difficulty remained. In 3 months from the disease onset, the evaluation of voiding difficulty, such as voiding cystourethrogram (VCUG) and urodynamic study(UDS) was conducted. In VCUG evaluation, left side vesicoureteral reflux was detected on 130cc filling and bladder has grade II trabeculation. UDS findings were hyposensitive, no refiexic, hypotonic and hypoactive bladder type. Vesicoureteral reflux remains until present and he is continuously using bladder catheterization.

Discussion: To our best knowledge, a case of neurogenic bladder with vesicoureteral reflux in Guillain–Barré syndrome has not been reported. From this report, we suggest that a patient with Guillain–Barré syndrome can suffer from urological dysfunction and serious complications. We suggest that thorough bladder evaluation should be considered in the management of Guillain–Barré syndrome patients with urological symptoms.

PP211

THE RELATIONSHIP BETWEEN ANTERIOR BLADDER WALL THICKNESS BY ULTRASONOGRAPHY AND TRABECULATION GRADING BY VOIDING CYSTOURETHROGRAM IN HYPER-REFLEXIC BLADDER OF SPINAL CORD INJURY

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Introduction: The thickness of anterior bladder wall (AWT) can be measured by ultrasonography (SONO). Recently, the grading of bladder trabeculation (BT) by voiding cystourethrogram(VCUG) was introduced.
Purpose: To investigate the relationship between AWT by SONO and BT grading by VCUG in patients with hyper-reflexic bladder(HRB) in spinal cord injury (SCI).
Methods:19 patients with SCI (17 males and 2 female, average age of 52.7 years, mean 54.9 months duration of injury) and the control group (8 males, average age of 38.5 years) participated. In VCUG, a total of 15 patients were at grade 1 of BT, each 2 patients were at grade 2 and 3. In the bladder type classification for detrusor reflexia by urodynamic study (UDS), there were 4 patients with HRB type and 16 patients with no-HRB. All patients underwent bladder SONO and VCUG as well as UDS.
Results: The mean AWT was 3.1mm in SCI and 2.5mm in the control. The measurement of AWT tended to be thicker in the SCI group than the control group (P=0.35). The mean AWT of grade 1 trabeculation was 2.9mm, and that of grade 2 and 3 were 3.4mm and 5.1mm, respectively. One-way ANOVA revealed that the AWT of grade 1 and 3 were significantly different (P=0.01).The mean AWT of patients having HRB was 4.8mm and that of no-HRB was 2.9mm. The anterior wall of HRB was significantly thicker than that of no-HRB in SCI (P=0.01).
Discussion and conclusions: Higher grade of BT showed thicker anterior wall in neurogenic bladder. And, the AWT of HRB was thicker than that of no-HRB in SCI. Using SONO to measure AWT of bladder seems helpful in the evaluation of the trabeculation and reflexicity. Further studies with more patients will be necessary for the advantage and limitation of ultrasonic bladder evaluation.

PP212
QUALITY OF LIFE OF PATIENTS WITH MULTIPLE SCLEROSIS AFTER TREATMENT FOR OVERACTIVE BLADDER

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Introduction The most common voiding disturbance in patients with multiple sclerosis (MS) is an overactive bladder, so it can cause health problems and decrease the patients' quality of life.
The purpose of this study was to evaluate the efficiency of the therapy with 2x5mg doses of Oxybutynin, then, the effects of daily Transcutaneous tibial nerve stimulation (TTNS) on quality of life of patients with overactive bladder (OAB) and multiple sclerosis.
Methods This was the cross-over study. The patients who suffer from MS, who underwent urodynamic tests showed that they have the overactive bladder. Symptoms which were included, were number of daily and night micturition, number of daily and night incontinence, urgency (> than 3 in 24 h), daily voiding (frequency> 8 to 24 h). Test quality of life was questionnaires OAB-q SF have been assessed before and after PTNS treatment. Subjects were divided into 2 groups of 30 patients: the first group received Oxybutynin tablets prescribed in a daily dose of 2x5 mg for 3 month, the second group had TTNS every day for a 3 months.
Results The results of the study TTNS daily therapy have shown good performance on the reduction all clinical symptoms of the bladder and improve quality of life, with statistical significance ($p<0,05$). Anticholinergic therapy with Oxybutynin showed the better results. The dose which used is half of the maximum, but gave a statistically significant improvement in Quality of life and symptoms ($p<0,0001$).
Discussion and conclusions Our recommendation for the treatment of OAB is Oxybutynin in doses of 2x5 mg as it gives good results for all the parameters (symptoms) and quality of life. If a patient for any reason can not tolerate anticholinergic drug, it is recommended daily stimulation TTNS.

PP213
PERCUTANEOUS TIBIAL NERVE STIMULATION INFLUENCE ON THE QUALITY OF LIFE FOR PATIENTS WITH FAECAL INCONTINENCE

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Introduction Faecal incontinence is an increasingly common condition with significant negative impacts on the quality of life and healthcare resources. Percutaneous tibial nerve stimulation is a new non-invasive treatment method which is used as an alternative to sacral nerve neuromodulation for faecal incontinence. It is simple, well tolerated and cost effective treatment method which can be performed in the outpatient clinic.
Purpose To identify how percutaneous tibial nerve stimulation (PTNS) affects the quality of life of patients with faecal incontinence.
Methods A study of 12 adult women who suffer from faecal incontinence. PTNS procedure may induce similar neuromodulatory effect to SNS by stimulating the posterior tibial nerve. Adhesive electrodes were put in the leg just above the ankle by posterior tibial nerve projection. Patients were stimulated for 4 weeks, 1 session was 20 min, stimulation parameters were 10 mA, 200-ìs, 10-Hz. Patients were given validated questionnaires of Wexner‘s score and QOL score pre-PTNS and post-PTNS.
Results Wexner’s score: quality of life for faecal incontinence ,assessment pre -PTNS : no deterioration 16.7%, less deterioration16.7%, deterioration 41.7%, significant deterioration 25.0% ; post PTNS : no deterioration 16.7%, less deterioration 41.7%, deterioration 8.3%, significant deterioration 8.3%, no answer 25% ($p < 0.05$). QOL score: Patients with faecal incontinence think that their health is: pre -PTNS: well 8.3%; moderate 58.3 %; low 25.0 %; post –PTNS: total 8.3%, well 16.7%; moderate 66.7 %; low 8.3 % ($p<0.05$).
Discussion and conclusions In our research after the PTNS procedure the quality of life increased for 75% of the patients with faecal incontinence. PTNS is an effective treatment method for faecal incontinence, but further research is needed as well as itemised indications. Our long-term outcome data will provide further information on the efficiency of tibial nerve stimulation in a larger cohort of patients.

PP214
PELVIC RADIOTHERAPY AND ANORECTAL FUNCTION – HOW TO MANAGE THE GASTRO INTESTINAL SYMPTOMS NAMELY INCONTINENCE BASED ON STRUCTURES INVOLVED

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Introduction: Prostatic, gynaecologic and anorectal cancer population have a very good chance of survival because nowadays oncologic treatments are very successful. But survivors very often have chronic gastrointestinal side effects that greatly influence/modified their quality of life. This symptoms are often overlooked because cancer priority is the exclusion and surveillance for recurrent cancer. Pelvic radiotherapy affects anorectal function in several kinds of ways being one important factor in faecal incontinence onset. Is it possible to predict the best therapeutic approach based on the characteristics of the radiation applied and the structures mainly target after ruling out other incontinence factors?
Purpose: We decided to analyse some paradigmatic cases of our incontinence patients to delineate best approach based not only in incontinence symptoms but also manometric results (where available), after ruling out others causes of chronic gastrointestinal symptoms in this population including diet and defecation habits.
Methods: Oncology patients submitted to pelvic radiotherapy with symptoms of incontinence have been analysed.
Results: Anal cancer is the most troublesome because there is possibility of direct surgical damage of continence structures but also because radiation have an important deleterious effect on the sphincter function so best results can be achieved with preoperative radiotherapy which permits surgical saving of sphincter structures.
Discussion: Pelvic radiotherapy affects the mechanism of continence depending on the target, dosimetry, etc. Following pelvic irradiation for malignant diseases the disorder is characterized by multiple dysfunctions including weakness of the external anal sphincter, stiffness of the rectal wall, and a consequent increase in rectal sensitivity. Literature offers some practical orientation. When the rectum is exposed, the rectal capacity is reduced and urge sensation with incontinence can be a problem but if the main target is anal sphincter and soiling or incontinence are major symptoms. BFB is a good approach for both situations.
Conclusions: The traditional acceptance of inevitability of incontinence after pelvic radiotherapy needs to be reformulated because we have the possibility to ameliorate it, giving not only life but also quality of life. Colostomy is an approach to decide only after be sure that incontinence has no other solution. The interest of BFB treatment of premorbid defecation disorders before oncologic treatments, if possible, needs to be investigated.

PP215
EVALUATION AND MANAGEMENT OF VOIDING DISORDERS IN PRM

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Introduction: Voiding disorders have a polymorphic clinical expression. In most cases, it requires urodynamic explorations to a better understanding of pathophysiological symptoms, with a view of adapting therapeutic options.
Purpose: Epidemiological assessment through clinical signs, etiologies, urodynamic profile and therapeutic management of patients with voiding disorders.
Materials and methods: Retrospective and descriptive study implemented over a period of one year (2013) including a series of 120 patients afflicted with with voiding dysfunction and in whom a urodynamic assessment was performed.
Results: The mean age: 42,74 years. Etiologies: Cauda equina syndrome (15.85%), Spinal cord injuries (13.41 %), Multiple Sclerosis (9.76%), Non-traumatic spinal injuries (7.34%), chronic urinary tract infections (8.54%), stress urinary incontinence (7.32%). Clinical Symptomatology : urinary incontinence (50%), dysuria (30.49%), urinary retention (19.51%). Urodynamic profile: Cystomanometry, uroflowmetry, post-mictional residue evaluation. Therapeutic management: medical treatment (50%), pelvic floor rehabilitation (16.67%), intermittent catheterization (50%), permanent catheterization (15.62%).
Discussion and conclusions: The voiding disorders represent an important concern for patients. Clinical and scoping manifestations are diverse. Urodynamic and clinical assessments are supplementary means to address mental and social patients concerns.

PP216
EVALUATION OF THE TIBIAL NERVE STIMULATION IN THE MANAGEMENT OF REFRACTORY OVERACTIVE BLADDER

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Introduction: Overactive bladder is a clinical syndrome defined by urge incontinence, frequency and urgency. it has a major impact on the quality of life of patients. Various treatments are available for this syndrome. Among them, percutaneous tibial nerve is proposed, especially in the case of lack of effectiveness of pharmacologic treatment.
Purpose: Study the effectiveness of percutaneous tibial nerve stimulation on the clinical symptoms of refractory over active bladder
Methods: Prospective study conducted in the department of physical and rehabilitation medicine in the Military Tunis hospital since June until September 2015. We included patients followed in the consultation of pelviperineology for urge incontinence, frequency and urgency secondary to idiopathic overactive bladder and resistant to anticholinergic treatment. 20 minutes percutaneous tibial nerve stimulation was applied 3 times a week during 2 months. Voiding diaries and Urinary Handicap Mesure were completed at baseline and at the end of therapy.
Results: 20 patients were included in the study, mean age 27.8 years old [6-70]. 90% of patients were significantly improved at the end of the treatment. Mean scale of Urinary Handicap scale Passed from 8,1 to 1.2.
Discussion and conclusions: Percutaneous tibial nerve stimulation is a non invasive method. It is effective for refractory overactive bladder, even if the frequency of stimulation is applied 3 times a week.

PP217
PREVALENCE OF EMOCIONAL DISTURBANCE IN PATIENTS WITH DYSSYNERGIC DEFECATION REFERRED FOR PELVIC FLOOR REHABILITATION

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Introduction Obstructed defecation syndrome (ODS) mainly affects women and may be due to functional and organic disorders. It is estimated that 25 to 50% have dyssynergic defecation (DD) and may be treated conservatively with diet, laxatives, behavioral changes and pelvic floor rehabilitation (PFR). PFR is the first line treatment and aims to correct the dyssynergic behavior of abdominal, rectal and anal sphincter muscles and to improve rectal perception. Patients often display features suggestive of concomitant emotional disturbance. Although there is debate whether the psychopathology is a cause or consequence of the condition, it has been reported to have a negative impact in the outcome of PFR program.
Purpose To investigate the prevalence of emotional disturbance in patients with DD referred for PFR in a tertiary hospital.
Methods We evaluated 15 consecutive patients with diagnostic criteria of DD assessed by clinical evaluation, MRI defecography and anorectal manometry. Previous psychiatric diagnosis, the Hospital Anxiety and Depression Scale (HADS) and Pittsburgh Sleep Quality Index (PSQI) were recorded.
Results Of the 15 patients (12 women, mean age 51 yr), 7 (47%) had previous history of psychiatric illness (anxiety/depression); 11 (73%) moderate or severe anxiety (HADS anxiety score>11) and 4 (26%) moderate or severe depression (HADS depression score>11); 14 (93%) had poor sleep (PSQI score>5).
Discussion and conclusions Outcomes of PFR for DD are highly dependent on patient motivation and commitment to a long and time consuming program. The high prevalence of emotional disturbance suggests that psychological counselling may be helpful for most of them and improve outcome. Many patients are not willing to undergo formal psychotherapy but acceptance is higher when psychological evaluation and relaxation sessions with a psychologist are offered as part of a PFR program. These data reinforce the importance of a multidisciplinary approach in the management of patients with DD.

PP218
INDICATIONS FOR URODYNAMIC STUDIES IN PATIENTS WITH INCONTINENCE AFTER PROSTATECTOMY

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Introduction: Incontinence postprostatectomy is very common and can reach up to 46% of the patients undergoing this procedure. Its main cause is intrinsic sphincter deficiency provoked by the surgical procedure and usually causing symptoms of stress urinary incontinence. However, detrusor overactivity, bladder outlet obstruction and decreased compliance often coexist and may have been present before the surgical procedure without previous symptoms which can initiate after surgery. Prior radiation therapy can also have a negative influence in incontinence postprostatectomy. This may cause a combination of symptoms such as stress, urge and overflow incontinence.
Purpose: We intend to create a protocol with the indications for the use of the urodynamic study after radical prostatectomy.
Methods: The authors did a bibliographic research for the most recent scientific literature on PUBMED and clinical guidelines of the most recognized continence societies.
Results: The urodynamic study is an expensive and sometimes difficult to access exam, so, its use should be based on the evidence of its benefit. It is useful in postprostatectomy urinary incontinence because it can determine the pathophysiology and severity of the intrinsic sphincter insufficiency and can be particularly important when there are combined symptoms, previous radiation therapy, conservative treatment failure and prior to any invasive treatment. Urinary incontinence postprostatectomy has a continuous recovery until up to 2 years after surgery being the appropriate timing for the urodynamic study usually 1 year after surgery.
Discussion and conclusions: Since it is an expensive and not always accessible examination, the urodynamic study in incontinence after prostatectomy should be requested adequately when there is recognized benefit and influence in prognostic and management decision. By doing this, it is possible to save resources and have the exam available when it is really needed.

PP219
REHABILITATION OF ALKAPTONURIA - CASE REPORT

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Introduction Alkaptonuria (AKU) is a rare autosomal recessive metabolic disease with a prevalence of about 1/1.000.000. It is caused by the lack of the enzyme homogentisic dioxygenase, which is responsible for the degradation of homogentisic acid (HGA), an intermediate from the metabolism of tyrosine and phenylalanine. Systemic circulation carries elevated HGA throughout the body leading to its deposition in multiple tissues. Its deposition in cartilage and connective tissues is called ochronosis. It mainly affects the musculoskeletal system, but can also affect the sclera, skin and cardiovascular and genitourinary systems. Pain and stiffness of knees, hips and spine are usually the first musculoskeletal system complaints.
Purpose Evaluate the outcome of the rehabilitation program instituted to a patient with AKU.
Methods 56 years-old, male, diagnosed with AKU. Complaints of bilateral knee pain and low back pain accompanied by stiffness. After arthroscopic debridement, the patient began rehabilitation program with hydrotherapy to manage pain, improve muscle strength and to maintain range of motion. He was encouraged to maintaining light exercise.
Results With instituted treatment, the patient pain improved moderately maintaining articular ranges of motion.
Discussion and conclusions There is no approved treatment for AKU. Diet protein restriction and nitisinone treatment are controverse and can stop the progression, but don't reverse the disease. More studies are needed to evaluate their safety and efficacy. Thus, an appropriate rehabilitation program is fundamental for the disease management, reducing pain and maintaining ranges of motion. Hydrotherapy with restriction of sports with contact or high impact is the recommended treatment for the prevention of the progression of the disease.

PP220
FACTORS RELATED TO INSTRUMENTAL ACTIVITIES OF DAILY LIVING IN PATIENTS WITH HIP OSTEOARTHRITIS

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Introduction: Health-related quality of life is positively associated with physical activity, including instrumental activities of daily living (IADL). However, few evidences for the factors related to IADL in patients with hip osteoarthritis (OA) have been collected and the factors have been undetermined.
Purpose: The aims of present study were (1) to clarify the factors related to IADL in patients with hip OA, and (2) to establish the cut-off values for the factors predicting maintenance of IADL.
Methods: This cross-sectional study included 48 females with hip OA. The Self-Rating Frenchay Activities Index, reflecting a greater level of independence and social survival, was used as a measure of IADL. Range of motion (ROM), muscle strength of the hips and knees, and 10 m walking speed were measured as independent variables. Other potential confounding factors were also measured. Data were analyzed using hierarchical multiple regression and Receiver Operating Characteristic curve analysis.
Results: The ROM of hip flexion on the affected side and 10 m walking speed were selected as significant variables independent of the confounding factors in hierarchical multiple regression analysis. The cut-off values obtained were 92.5 degrees for the ROM of hip flexion on the affected side and 42.3 m/min for 10 m walking speed.
Discussion and conclusions: The suggested target associated with maintaining IADL in patients with hip OA is the cut-off value of 42.3 m/min for 10 m walking speed. These values may be useful to establish the rehabilitation goals in patients with hip OA.

PP221
COMPLEX REHABILITATION IN OLD FEMALES WITH KNEE OSTEOARTHRITIS AND KNEE-SPINE SYNDROME

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Introduction. Osteoarthritis affects around 12 per cent of elderly people and knee osteoarthritis (KOA) is a degenerative knee disease and a major cause of disability among the aging population, with prevalence approximately 30% in those over 65 years old (1,2). Low back pain and knee pain are among the most common complaints of people over 60 years old.
Purpose. The objectives of our single blind, randomized controlled study were to evaluate the parameters and to assess the short-term effects of rehabilitation program (RP) on quality of life of females with KOA and dysfunctional complaints in dorsal-lumbar vertebral segments.
Methods. 45 old KOA females were randomized into two groups: Group 1 – 24 patients (G1) was treated by complex RP (medication, TENS, ultrasound, stretching and strenghthning exercises) and group 2 – 21 patients (G2) control receiving only medication. All patients were evaluated (clinical, imagistic and functional) initial and finally. The outcome assessments were Allis test, pain intensity (VAS), sonographic aspects, Lequesne knee severity index. At three weeks an independent physiotherapist performed all outcome assessments.
Results. In both groups, Allis test was negative - sustained the functional aspect of lower limb inequality. The improvements were found in Lequesne Knee Index (45 % in G1 and 19 % in G2) ($p < 0.05$), improvement in G1 was significantly higher than G2 ($p < 0.01$). VAS scores for pain reduced significantly higher in G1. The sonographic aspects were corellated with functional paramaters in G1 females.
Discussions and conclusions. The disability in our study females with functional lower limb inequality and functional disturbance of vertebral curvatures is explained through reciprocal conditions and direct consequence through somatic dimension of kinematics chains. The complex RP is performed both for maintaining a neutral spine posture while moving the extremities and for lower limbs.

PP222
EFFECTS OF AN EARLY ECCENTRICALLY BASED REHABILITATION AFTER TOTAL KNEE ARTHROPLASTY

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Introduction Progressive eccentric resistance has been shown to safely increase muscle strength in various populations.
Purpose To investigate the effects of early eccentric resistance training on functional performance after total knee arthroplasty
Methods Thirty-four patients who underwent a primary total knee arthroplasty (TKA) were randomly assigned to 1 of 2 groups: a ECC group that received eccentric exercise (n=16) and a CON group that received concentric exercise (n=18). All randomized patients received early progressive resistance training (1 of 2 interventions) with 5 sessions per week for 2 weeks, starting at 2 weeks after TKA. To evaluate self-reported physical function, self-reported disease-specific physical function measured by using the Western Ontario McMaster Universities Osteoarthritis Index (WOMAC) and self-reported quality of life measured by using EuroQOL five dimensions (EQ-5D) questionnaire were used. To evaluate physical performance, the following assessment tools were measured: 6-minute walk test (6MWT), timed up and go (TUG) test, timed stair climbing test (SCT), gait analysis, isometric knee flexor and extensor strength of the surgical and non-surgical knees. All patients underwent these evaluations before surgery and 1 month after surgery.
Results Both groups significant improvements in WOMAC-pain and function, and EQ-5D scores, and the ECC group showed statistically significant and clinically meaningful improvements in 6MWT, gait speed, peak torque (PT) extensor of non-surgical knee while the CON group showed significant improvements in only single support duration. Although PT extensors of surgical knee in both groups did not reach the preoperative level, the change scores of PT extensor of surgical knee in the ECC group were significant less than those in the CON group.
Discussion and conclusions This study demonstrated that early eccentric resistance training was effective for not only minimizing a loss of quadriceps strength of surgical knee but also improving endurance and gait speed after TKA.

PP223

INTENSIVE FAST-TRACK REHABILITATION FOCUSING ON PROGRESSIVE RESISTANCE TRAINING TO ENHANCE FUNCTIONAL PERFORMANCE EARLY AFTER TOTAL KNEE ARTHROPLASTY

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Introduction Decreased functional performance in the early phase after total knee arthroplasty seems to be related quadriceps weakness.
Purpose To demonstrate the effectiveness of intensive fast-track rehabilitation program to enhance early functional recovery after total knee arthroplasty.
Methods A total of 60 patients (7 males and 53 females ; average age 71.9 ± 6.1 years) who underwent a primary total knee arthroplasty (TKA) were recruited. All participants received progressive resistive training with 5 sessions per week for 3 weeks, starting within the first week after TKA. All outcome measures were collected before surgery and at 1 month after surgery. Primary outcomes included 6-minute walk test (6MWT), timed up and go (TUG) test, stair climbing test (SCT), gait analysis, isometric knee flexor and extensor strength of the surgical and non-surgical knees. Secondary outcome measures included self-reported disease-specific physical function measured by using the Western Ontario McMaster Universities Osteoarthritis Index (WOMAC) and self-reported quality of life measured by using EuroQOL five dimensions (EQ-5D) questionnaire.
Results In the primary outcome, there were statistically significant and clinically meaningful improvements in change scores from before surgery to 1 month after TKA for 6MWT, TUG, gait analysis except single support duration, peak torque (PT) extensor of non-surgical knee. Although PT extensor of surgical knee did not reach the preoperative level, the change scores were much smaller compared with previous results in other studies. In the secondary outcome, WOMAC-pain, WOMAC-function, and EQ-5D scores after 1 month after TKA were significant higher compared with those before surgery.
Discussion and conclusions This study demonstrated that early, intensive fast-track rehabilitation program focusing on progressive resistance training was effective for not only improving endurance, balance, gait function, quadriceps strength of non-surgical knee but also minimizing a loss of quadriceps strength of surgical knee after TKA.

PP224
PREOPERATIVE PHYSICAL FUNCTION INFLUENCES ON FUNCTIONAL STATUS 1 MONTH AFTER TOTAL KNEE ARTHROPLASTY

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Introduction Several recent studies have shown that preoperative physical function consistently predict postoperative functional status.
Purpose To identify preoperative physical performance factors predictive of self-reported physical function and quality of life for people 1 month following total knee arthroplasty.
Methods We assessed a total of 60 patients (7 males and 53 females ; average age 71.9 ± 6.1 years) who underwent a primary total knee arthroplasty (TKA). Before and 1 month after TKA, patients completed self-reported disease-specific physical function measured by using the Western Ontario McMaster Universities Osteoarthritis Index (WOMAC) and self-reported quality of life measured by using EuroQOL five dimensions (EQ-5D) questionnaire. Physical performance tests included 6-minute walk test (6MWT), timed up and go (TUG) test, timed Stair Climbing Test (SCT), gait analysis, and isometric knee flexor and extensor strength of the surgical and nonsurgical knees.
Results The postoperative WOMAC function score had a significant positive correlation with the preoperative WOMAC function score (r=0.28, p=0.04), WOMAC pain score (r=0.30, p=0.03), WOMAC stiffness score (r=0.34, p=0.02), SCT-ascent (r=0.39, p=0.01), SCT-descent (r=0.38, p=0.01), and a significant negative correlation with preoperative peak torque (PT) extensor (r=-0.32, p=0.02) and PT flexor (r=-0.32, p=0.02) of the surgical knee, PT flexor (r=-0.42, p=0.01) of the nonsurgical knee. The postoperative EQ-5D score had a significant positive correlation with the preoperative EQ-5D score (r=0.40, p=0.01), gait speed (r=0.31, p=0.03), and a significant negative correlation with the preoperative SCT-ascent (r=-0.34, p=0.03), SCT-descent (r=-0.37, p=0.01). The preoperative SCT-ascent (â=0.39, p=0.01) was a factor predictive of the postoperative WOMAC function score, and the preoperative EQ-5D score (â=0.36, p=0.04) and gait speed (â=0.34, p=0.04) were factors predictive of the postoperative EQ-5D score.
Discussion and conclusions This study demonstrated that preoperative stair climbing ability and gait speed significantly influenced on postoperative self-reported physical function and quality of life 1 month after TKA.

PP225
INFLUENCE OF ANTHROPOMETRIC, SOCIO DEMOGRAPHIC AND CLINICAL CHARACTERISTICS IN THE ULTRASOUND TREATMENT OF PATIENTS WITH KNEE OSTEOARTHRITIS

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Introduction: The physiotherapy treatment of persons with knee osteoarthritis (OA) includes physical modalities such as therapeutic ultrasound (TUS), which contributes to decrease pain, increase muscle strength and range of motion and to improve functionality; however, its effectiveness can be influenced by patient characteristics.
Purpose: To evaluate the influence of anthropometric, socio demographic and clinical characteristics of persons with knee OA in the TUS treatment results.
Methods: A quasi-experimental study that included 17 participants with knee OA grade II and III. Ten sessions of pulsed TUS were applied (ERA 10 cm2, frequency of 1MHz for 4 minutes, SATA of 0.44 W / cm2) on medial and lateral compartments of the knee. Dependent variables: pain, joint mobility, muscle strength and function. Covariates: gender, age, socioeconomic status, schooling, use of analgesics, kind of analgesics, dominance, signs of patellofemoral OA and physical activity level. The influence of covariates on significant changes in dependent variables was analyzed using binomial regression models, the goodness of fit of each model was evaluated with linktest.
Results: The effect of TUS on pain intensity was influenced by schooling; increased muscle strength by age and improvement in functionality by bilateral knee OA, degree of severity, signs of OA patellofemoral and practice of vigorous physical activity.
Conclusions: The TUS application in people with knee OA reduces the pain, increases the muscle strength and has benefits in functionality; however this results can be influenced by variables on which the physical therapist have not control, but they are important to take clinical decisions in line with the population characteristics.

PP226
EVALUATION OF FUNCTIONAL RECOVERY IN PATIENTS WITH COXARTHROSIS

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Introduction: An increasing number of people are suffering od degenerative diseases of hip, most sensitive part of locomotor system. There are many findings about effectiveness of physical therapy after surgical treatment of coxarthrosis, but few about effectiveness physical therapy as conservative treatment.
Purpose: The purpose of the study was to estimate how many does physical therapy affect on functional rehabilitation by patients withe coxarthrosis.
Methods: Our restrospective study included 47 patients with coxarthrosis, diagnosed on the basis of ACR (American Collegue of Rheumatology) criterion. Data about age, gender, value of manual muscle test (MMT), and value of Barthel's index on reception and release, was taken from medical documentation.
Results: There was statistic significant difference (p<0,05) between the value of MMT and Barthel's index in patients with coxarthrosis on reception and release. The highest percentage of patients were women (76,6%). Most common gender group was above 70 years (48,9%). Shortest time of treatment (10-20 days) was at 23,4% patients, and longest (31-40 days) was at 29,8% patients. Most common diagnosis was Coxarthrosis bilateralis (59,6%). Greatest number of patients was hospitalized for the first time (70,2%). Most common modality of treatment was kinesiotherapy (74,5%).
Disscusion: Our results based on age, gender are the same as the results available in relevant literature. Our treatments were longer then other treatments, which we have based on other researches and available literature. Functional recovery in our patients treated with physical therapy, showed improved results at the end of therapy. Despite of that we had not many researches on this field, it is necessary to try physical therapy before any other options.
Conclusions: Considering that values of MMT and Barthel's index was statistic significant higher at release than on reception, we can conclude that physical therapy has positive effect on functional rehabilitation at patients with coxarthrosis.

PP227
EFFECTS OF A HOME-BASED EXERCISE PROGRAM ON MUSCLE STRENGTH, POSTURAL STABILITY AND FUNCTIONALITY OF PATIENTS WITH OSTEOARTHRITIS OF THE KNEE

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Introduction: Osteoarthritis is the most common chronic joint disease, with significant functional and economic consequences. It is important to study new and more practical treatment strategies, logistically and financially, to improve the functionality and quality of life of these patients.
Purpose: To evaluate the effects of an unsupervised, home-based, exercise program in muscle strength, functional mobility, range of motion, pain, physical function and postural stability in patients with osteoarthritis of the knee.
Methods: Twelve participants (62.8 ± 2.5 years) with clinical criteria for knee osteoarthritis participated in a 4-week exercise rehabilitation program. Outcome measures were evaluated before and after the program and included: isometric muscle strength (dynamometer), functional mobility (Timed Up & Go Test), range of motion of the knee (goniometer), pain (visual analogue scale), physical function (Knee injury and Osteoarthritis Outcome score and Physical Function Short-form) and postural stability (force platform). The home-based program included 5 sessions per week of 5 exercises targeting muscle strengthening and joint mobility. Data is reported as mean ± SD or median (interquartile range). The paired Student t-tests or Wilcoxon signed rank tests were performed for within-group comparisons.
Results: The exercise program significantly improved functional mobility [9.7 (4.1) to 8.8 (2.1) s, p=0.023)], muscle strength of the quadriceps (23.9 ± 10.1 to 29.3 ± 10.7 kg, p=0.022) and hamstrings [10.0 (7.8) to 11.3 (7.1) kg, p=0.008], pain (6.4 ± 2.2 to 4, 1 ± 2.2 mm; p=0.006) and physical function (54.9 ± 21.7 to 41.7 ± 14.5 points, p=0.011). The range of motion of the knee and the postural stability, namely center of pressure displacement (anteroposterior and mediolateral), velocity and area, did not improve significantly.
Discussion and conclusions: A home-based exercise program simple and easy to perform improved muscle strength, functional mobility, physical function and pain in patients with osteoarthritis of the knee.

PP228
TOTAL KNEE ARTHROPLASTY REJECTION SECONDARY TO NICKEL ALLERGY: CASE REPORT

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Case report: 65 years old woman with metal allergy who presented rejection to a total knee arthroplasty.
Case description: patient diagnosed of knee arthrosis with no self-reported allergies underwent a total knee arthroplasty surgery in January, 2015. In the post-operative follow up the patient referred pain andflexion limitation with a passive range of motion (ROM) S: 0-5-60. Passive mobilizations under continuous femoral nerve block and arthroscopic arthrolysis with sample collection were performed. The pathological study showed fibrosis without acute inflammatory activity. Despite all these procedures the ROM stabilized at S: 0-0-105º and the pain visual analog scale (VAS) score of 7. Bone scan was inconclusive. Positivity for nickel and palladium was found in the metal allergy test. In July, 2015 arthroplasty replacement was performed using ceramic knee prosthesis. The patient reported improvement of pain with a VAS score of 2, although the ROM stabilized at S: 0-5-75.
Discussion: the incidence of metal prosthetic implants allergy is not well known. Cutaneous manifestations and aseptic loosening are the most common symptoms. However, it is usually a diagnosis of exclusion and its detection is delayed due to the lack of specific tests. In patients with postoperative persistent pain, the combination of patchtesting, lymphocyte transforming tests and periprosthetic histopathology would strongly suggest metal allergy diagnosis.
Conclusions: metal hypersensitivity reactions can be a contributor in the pathogenesis of implant failure until validated screening tests are developed to identify patients that will develop a symptomatic metal allergy after joint arthroplasty. Persistent postoperative pain in presence of coexisting skin lesions should alert of a metal prosthetic implant allergy. The preoperative detection combining different diagnostic tests before revision surgery could be useful and selective use of prostheses that do not contain cobalt, chromium, or nickel may be considered.

PP229
PLATELET-RICH PLASMA (PRP) INJECTIONS AND KNEE OSTEOARTHRITIS

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Introduction: Platelet-rich plasma injections are a promising therapeutic approach for musculoskeletal disorders. The scientific basis of PRP is compelling but the research is currently in the beginning. Knee osteoarthritis is a common articular disease in clinical practice and different methods are used to alleviate the symptoms. PRP intra-articular injection may play a role in stimulate cartilage healing process.
Purpose: To analyze the current literature about platelet-rich plasma, and to describe the clinical evidence of the injection of PRP in patients with knee osteoarthritis.
Methods: It was made a bibliographic research using PUBMED online resources. Search items included combinations of the words: "platelet-rich plasma"; "knee", "osteoarthritis". Additional studies were identified by searching bibliographies of relevant articles.
Results: From the research, resulted 31 articles. We only chose reviews written in English, and published since the year 2012. Three articles not concerning osteoarthritis were excluded. One not concerning PRP was excluded. In the end there were 15 relevant articles left.
Discussion and conclusions: The applications of platelet-rich-plasma in musculoskeletal disorders is growing significantly. In patients with symptomatic knee OA, PRP injection may result in significant clinical improvements up to 1 year post injection. There is still a paucity of level 1 evidence studies regarding indications, technique, adjunctive options, and results of PRP injections and no definitive recommendations can be made at this time.

PP230
SINGLE US GUIDED HA INJECTION REDUCED HIP PAIN AND IMPROVED FUNCTION FOR 20 MONTHS IN A CASE OF HIP OSTEONECROSIS

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Introduction: Hip osteoarthritis(HOA) and osteonecrosis(HON) are two separate kinds of arthropathies, each has its distinct features regarding epidemiology, histopathology and radiographic findings. Non-operative management of HON was described in addition to total hip arthroplasty(THA), however the ultimate goal of all suggested treatments was the reservation of the involved hip,with less concern to the associated osteoarthritic changes.
Purpose: To report the unexpected long term amelioration following single US guided Hylastan SGL80 injection in a case of HON with osteoarthritic component upon his refusal to THA.
Methods: Through longitudinal antero-inferior approach,4ml Hylastan SGL-80 was injected under ultrasound real time imaging.The main outcome measures were:Visual Analogue Scale (VAS),McGill Pain Questionnaire,Western Ontario McMaster Questionnaire,Lequesne Index&tenderness scale. Patient was followed 1 month,3,6,12,18&20 months post-injection.The percentage of the change in applied scales was calculated and compared to baseline values.
Results: Significant clinical improvement was reported in all time points till 20 months post-injection, with complete absence of hip pain at 6 and 12 months,the trend of improvement showed ups and downs without reaching to baseline values in any of the scales except VAS at 1 month&18 moths. Clinical evaluation showed painless ROM with partial improvement regarding limitation,disappearance of pre-existed tenderness&limping.
Discussion and Conclusion: Although the patient was not committed to the prescribed exercise program,satisfactory improvement was obtained as soon as the 1st visit&significant improvement maintained till the 20 months post-injection;HA could be a feasible option for HON when THA is not applicable or refused by the patient.Further investigations are suggested to obtain firm evidence about the efficacy&safety of HA injection in symptomatic treatment of hip osteonecrosis. - Kaushik AP, DAS A, Cui Q. Osteonecrosis of the femoral head: An update in year 2012. Worl J Orthop. 2012; 13(5):49-57.

PP231
ANSERINE BURSITIS - IMPORTANT PAIN FACTOR IN KNEE OSTEOARTHRITIS

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Introduction: Anserine bursitis is an important algogenic factor in degenerative pathology of knee often getting confused with an internal meniscus lesion due to localization in the medial region of the knee. It is a disease often under-diagnosed and under-treated. It mostly occurs in women in menopause, with obesity and genu valgum.
Purpose: Highlighting the prevalence and the fact that the association of anserine bursitis in patients with knee osteoarthritis augments the pain and disability.
Materials and methods: The study included a total of 80 patients diagnosed with knee arthritis, during January 2015-June 2015, who appeared in the Service of Rehabilitation. In these patients based on symptoms, clinical examination and ultrasonography examination was backed up the diagnosis of anserine bursitis. WOMAC scale was used to assess the pain, joint stiffness and functional capacity.
Conclusions: Anserine bursitis was associated in 65% more common in women and those with obesity. In these patients, both the pain, joint stiffness, and the functional deficit were more felt.

PP232
THE EFFECT OF MECHANICAL MASSAGE ON EARLY OUTCOME AFTER TOTAL KNEE ARTHROPLASTY: A PILOT STUDY

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Introduction: The edematous response to total knee arthroplasty creates incompetence in the lymphatic system and persistent edema. Mechanical massage via Endermologie® improves superficial lymphatic drainage and lymphatic transport capacity.
Purpose: The aim of this study was to evaluate the efficacy of mechanical massage via Endermologie® after total knee arthroplasty in reducing edema and pain and improving knee range of motion, in the early postoperative period.
Methods: Eighteen patients with knee edema following total knee arthroplasty were randomly assigned to the intervention group (n=8) or the control group (n=10). The intervention group received mechanical massage therapy using Endermologie® and the control group received conventional physical therapy for 20 minutes a day, 5 times a week from the seventh day postsurgery. Clinical assessments included active knee flexion and extension range of motion, knee pain using a numeric rating scale, the operated limb circumference, the soft tissue cross-sectional area using ultrasonography, the extracelluar fluid volume, and single frequency bioimpedance analysis at 5 kHz using bioelectrical impedance spectroscopy.
Results: Both groups showed significant reduction in edema and pain, and improvement in active knee flexion at the end of treatment. There were no significant inter-group differences before or after treatment.
Discussion and conclusions: Mechanical massage could be an alternative way of managing knee edema after total knee arthroplasty in early postoperative recovery.

PP233
SERUM BIOMARKERS IN KNEE OSTEOARTHRITIS.

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Introduction: Osteoarthritis (OA) is a degenerative joint disease characterized by cartilage alteration and subchondral sclerosis. The destruction of these tissues causes pain and stiffness. Joint damage is more common in developed countries, including Spain and the United States. OA Incidence increasing with age.
Objectives: The objective was to describe the presence of a specific proteomic profile (biomarkers) in serum in patients with knee osteoarthritis (including prosthetics).
Methods: This was a prospective cross-sectional study with two groups. Group C (control) and A (arthritis, including prosthetic patients). Inclusion criteria were those of the American College of Rheumatology (ACR) for knee osteoarthritis. 50C and 116A. Serum was analyzed. Double serum protein depletion, separation with gel electrophoresis and MALDI was performed.
Results: Twelve differential proteins between groups have been isolated, including 7 suggest as the potential biomarkers. Proteins are proposed as potential biomarkers: IG alpha1 region C, haptoglobin, alpha 1 beta glycoprotein, zinc alpha2-glycoprotein inhibitor of plasma protease C1, complement factor B and Ig kappa region C.
Conclusions: There is a specific proteomic profile in serum in patients with knee osteoarthritis.

PP234
SARCOPENIA DIAGNOSIS AND TREATMENT

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Introduction: Ageing is associated with sarcopenia, this syndrome is characterised by a progressive and generalized loss of skeletal muscle mass and strength. After 50 years of age, muscle mass declines approximately 1 to 2%/year. There are several mechanisms that may be involved, loss of motor neurons and decrease of myofibrillar protein synthesis, decreased anabolic hormone production, inflammatory mediators, among others.
Purpose: Based on this review we propose the diagnostic approach to a patient with sarcopenia and treatment.
Methods: We used a recent revision, last 11 years, of the literature on this topic.
Results: This syndrome is correlated with the increased risk of falls and fractures, due to reduced balance capacity and core strength, leading to disability, hospitalization and increased mortality. It is associated with frailty, and specific comorbidities including poorer bone health, obesity, and type 2 diabetes. Resistance training improves the functional movement capabilities due to neural adaptations; they also improve insulin resistance, enhance cardiovascular health, promotes bone development and reverses specific ageing factors in skeletal muscle. Early intervention and diagnosis of this syndrome have prognostic and therapeutic implications. Based on this literature review, we propose the following diagnostic approach: gait speed: <0.8m/s; weakness: grip strength <26 kg(men) and <16 kg(women); low lean mass: appendicular lean mass (ALM) adjusted for body mass index (BMI) (<0.789 men and <0.512 women).
Discussion and conclusions: Sarcopenia is multifactorial a consequence which increases with age. It is important to recognize and identify this syndrome in the early stages. This syndrome is considered to be associated with decreased physical function, bone fracture, osteoporosis, insulin resistance and falls. Currently main interventions include lifestyle changes, resistance and aerobic exercise programs together with adequate protein and energy intake, have shown to be effective interventions that improves sarcopenia.

PP235
POLYMYOSITIS PRETENDED AS A MOTOR NEURON DISEASE – THE IMPORTANT ROLE OF A REHABILITATION PROGRAM

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Introduction and purpose: Polymyositis (PM) is a chronic, inflammatory and autoimmune muscle disorder, predominantly, characterized by muscle proximal weakness, with a symmetric distribution. Due to the pathophysiologic process and muscle disused, patients experience fatigue, physical deconditioning, difficulties at walking and manual control, and become less independent at their daily life activities (DLA). We present a polymyositis case with a rare clinical onset, and highlight the importance of a Rehabilitation Program in myopathic patients.
Methods and results/Case description: A 66-year-old woman was admitted for investigation of acute-onset dysphagia, dysphonia, weight loss and fatigue. Examination revealed oropharyngeal weakness, tetraparesis without a clearcut pattern and normal tendon reflexes. No gait imbalanced, pathologic reflexes or fasciculations were observed. Although the bulbar-onset might misguide to a motor neuron disease (MND), a high serum creatine kinase led to the suspicion of an inflammatory myopathy, confirmed by electromyography, autoimmune positivity and muscle biopsy. The patient immediately started pharmacologic treatment with corticosteroids and immunoglobulin, and a percutaneous enterogastrostomy was temporarily inserted. Also, she initiated a personalized Rehabilitation Program with Speech and Physical Therapy (submaximal strengthening and aerobic training). Along this program, blood tests were performed without any signs of muscle damage. At re-evaluation, she had already oral alimentation, improvement of muscle force and motor performance tests, autonomy at walking and independence at DLA.
Discussion: Bulbar-onset PM may mimic a MND. With inflammatory markers or elevated muscle enzyme levels, further investigations such as electromyography and muscle biopsy are indicated. Until recently, active physical exercise was controversial in these patients. Recent studies have shown that moderate exercise can improve muscle performance without damage to muscles cells. In the present study, it is reported the benefits, of a personalized rehabilitation program, on muscle strength, physical capacity and functional improvement.
Conclusions: In PM, combining exercise program and pharmacologic therapy is a safe approach and has clear beneficial effect on muscle function and quality of life.

PP236
DERMATOMYOSITIS – PHYSICAL REHABILITATION AS A BRIDGE TO BIOLOGICAL AGENTS

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Introduction: Dermatomyositis is the most common chronic idiopathic inflammatory myopathy. It is a multisystemic disease characterized by symmetrical muscle weakness of the proximal and extensor muscular groups, muscles of neck and pharynx, vascular lesion and cutaneous eruption that may precede systemic symptoms in months or years. Incidence is greater between 40-50 years old, and it occurs twice as much in women. Corticosteroids is the initial base of treatment, however, immunosuppressants and biological agents assume a more and more important role. Physical rehabilitation significantly improves symptoms and functional capacity of patients with dermatomyositis.
Purpose: To show the major importance of physical rehabilitation programs to maintain and even improve physical status of patients being treated for other diseases.
Methods: Man, 40 years old, previously autonomous. Dermatomyositis diagnosis 3 years ago, starts with progressive tetraparesis and dysphagia for solids and liquids. Starts corticosteroids with partial response. Initiates azathioprine, later substituted by methotrexate, removed after serious lower respiratory tract infection. Starts motor/respiratory rehabilitation and speech therapy. Starts rituximab 7 months ago.
Results: After initiation of physical/respiratory rehabilitation and speech therapy an overall good functional status was achieved. Initiation of rituximab was associated with great improvement both in motor function as in dysphagia.
Discussion and conclusions: Rituximab is an effective agent for the treatment of recurrent and resistant forms of dermatomyositis. Physical/respiratory rehabilitation and speech therapy, tailored to patient needs is an important adjuvant therapy for a good overall status maintenance, retarding progression of disease.

PP237
INFLUENCE OF CLIMATIC FACTORS TO THE ONSET AND DEVELOPING RHEUMATOID ARTHRITIS

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Introduction: Climatic factors, especially temperature, humidity, atmospheric pressure and the amount of the sunlight, as well as the other environmental factors can have influence to the onset and developing rheumatoid arthritis.
Objective: The possible role of climatic factors in the etiopathogenesis of rheumatoid arthritis.
Methods: Systematic review was performed using PUBMED, Current Contents and Cochrane Database of Systematic Reviews. Original and review papers that relate to possible effects of climatic factors in a patients with rheumatoid arthritis were included in the analysis.
Results: Eighteen studies were found, out of which there were 8 original papers and 10 review papers. The lowest number of participants in a study was 30 and the highest 82000. Studies followed participants from 1 to 22 years.
Conclusions: Climatic factors combined with a genetic predisposition, and other environmental factors can have a role in earlier onset and faster developing of rheumatoid arthritis, with possibility to amplify symptoms and cause more frequent recidivism, which affect patients depending on the individual circumstances.

PP238
DOES ALEXITHYMIA ASSOCIATED WITH HIGH DISEASE ACTIVITY IN ANKYLOSING SPONDYLITIS?

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Objective: Alexithymia is a personality trait related to inability to identify and describe one's own feelings and a preference for externally oriented thinking. Aim of our study is to compare the disease activities of ankylosing spondylitis (AS) patients classified as alexithymia with non-alexithymics and investigate the correlation between alexithymia and depressive symptoms, and disease activity.
Materials and methods: 60 patients diagnosed with AS enrolled to the study.. The groups were compared with respect to disease activity scores defined by using BASDAI-BASFI scores. The patients were classified as alexithymics, and non- alexithymics according to Toronto-20 Alexithymia scale.The correlation analysis performed between alexithymia, and disease activity scores, and the severity of depressive symptoms among whole study group.
Results: In all, 20 patients were classified in alexithymic group whereas 40 patients in non-alexithymic. In alexithymic AS patients, disease activity scores were found to be higher. Beck depression scores were higher in alexithymics. Disease activities determined by using BASDAI-BASFAI were positively correlated with alexityhmia score population.
Conclusions: Indexes used in the assesment of disease activity in AS include some items based on patients' declaration. Presence of alexithymia may be cause determining high disease activity as a result of impairment in describing, and identifying inner feelings in AS patients

PP239
IMMEDIATE EFFECT OF AEROBIC TRAINING ON ARTERIAL STIFFNESS – NOVEL MARKER FOR MONITORING OF CARDIOVASCULAR FITNESS

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Introduction: Metabolic syndrome (MS) subjects have 5 fold increased risk of diabetes and 1.4-4 fold of cardiovascular disease (CVD). Part of higher CVD risk in MS is attributed to the changes in the arterial system, namely increased arterial stiffness.
Purpose: The aim of the study was to evaluate the effect of a supervised aerobic training program on physical capacity, arterial stiffness and blood plasma lipids.
Methods: The study included 43 middle-aged subjects with MS (NCEP ATP III) without overt CVD involved into Lithuanian high CV risk primary prevention (LitHiR) program. The training program consisted of 8 weeks of moderate intensity aerobic exercises 30-40 min/day, 5 days/wk. The age of subjects was 54.59±6.05, among them were 28 (65.12%) women and 15 (34.88%) men. Central obesity, dyslipidemia and poor aerobic physical capacity was present in all subjects. Total cholesterol (TC, mmol/l), high-density lipoprotein-cholesterol (HDL-C, mmol/l), low-density lipoprotein-cholesterol (LDL-C, mmol/l), triglycerides (TGs, mmol/l), maximal oxygen uptake (Vo2max, ml/kg/min) and arterial stiffness parameters (Sfigmocor) - carotid-femoral and carotid-radial pulse wave velocities (PWV, m/s) were obtained before and after the aerobic training program.
Results: Exercise training for 8 weeks significantly increased VO2max (21.2±5.78 to 23.05±5.3, P<0.001), reduced carotid-femoral (8.59±1.33 to 7.98±0.98, P=0.003) and carotid-radial (9.02±1.01 to 8.42±1.09, P=0.012) PWV. Significant lowering of plasma lipids levels was revealed: TC (6.45±1.12 to 5.97±1.19, P=0.08) and LDL-C (4.4±1.06 to 3.83±1.1, P=0.06). Statistically significant correlation between the levels of TC, LDL-C and carotid-femoral PWV was found.
Discussion and conclusions: Improvement of arterial stiffness parameters after physical training could mean very early subclinical still reversible changes in the arteries and proves preventive effect of aerobic training on development of atherosclerosis in metabolic syndrome subjects. Lipid lowering meant improved metabolic profile after training.

PP240
SYNERGISM WORK OF PHYSICAL AND REHABILITATION MEDICINE AND SURGICAL INTERVENTION IN LATE-ONSET RADIAL NERVE PALSY - A CASE REPORT

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Humeral fractures are frequently associated with radial nerve lesions (incidence up to 17%). However, symptoms are more common in moment of fracture or immediately after surgical or closed reduction. But, there are a third type, rare, that have correlation with growing of bone healing that compress or involve the radial nerve – late-onset radial nerve palsy. The identification and treatment are a multidisciplinary challenge. The authors present a case report of a woman with 71 years old, that after a fall, did a humeral fracture. Conservative treatment and immobilization with an orthosis (Brace), was performed. The follow-up did in Orthopedic outpatient clinic and by Family Physician. After five weeks, she referred symptoms of paresthesia's in dorsal aspect of first and second fingers and decreased strength in the wrist extension and fingers (grade 2 muscle strength) to her Family Physician. She was revalued by Orthopedics, and initiated a physiotherapy protocol of rehabilitation. However, after eight weeks hadn't any progression. Orthopedics decided to do a surgical exploration of radial nerve, and radial was partially inside of bone healing, and they released him. The sensitive symptoms decreased immediately after surgery, but kept motor symptoms. She began a physiotherapy protocol of six months, three times/week, that included motor rehabilitation by electrical stimulation and therapeutic exercise for muscle strengthening. Currently, she has only a decrease of strength in extension of 1st finger (grade 4).
In this case the patient began the neurological symptoms later, in comparison with common cases. But the Family Physician that follows the patient, immediately signaled the situation to the hospital. The majority causes of late-onset radial nerve palsy was difficult recuperation because the later diagnosis and treatment. But in this case, the articulation of differences specialties, was an example of group work, that was crucial for injury treatment.

PP241
HOW TO TREAT A PATIENT WITH A ROTATOR CUFF RECONSTRUCTION? A REVIEW ON THE STANDARD OF CARE

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Introduction: A rotator cuff rupture is one of the most frequent reasons for shoulder pain. The tendon reconstruction is the most successful surgical treatment and also the best clinical practice. But there is no consent concerning the following rehabilitation.
Purpose: The aim of this review is to acquire the „best clinical practice" for the rehabilitation of a rotator cuff reconstruction based on a literature research and a survey of DVSE experts (German association of shoulder and elbow surgery).
Methods: A literature search was performed in the relevant databases and in bibliographies of included studies. After analyzing and grading the literature, expert options were gathered to the topics immobilization, physical therapy, CPM (continuous passive motion) and home exercises as well as to a four-phase-model which is deduced from the literature results.
Results: Ten studies, two reviews and one guideline fulfilled the inclusion criteria of the literature research. Even there is no evidence-based reference regarding the post-surgery immobilization, early passive exercises can be recommended. They can be assisted without a negative effect on the healing process by CPM and home exercises. An early cryotherapy can increase the pain.
Discussion and conclusions: No evidenced-based therapy recommendation can be deduced by the current available studies. But the study results combined with the expert opinions show a clear structure for „best clinical practice", which was summarized in a four-phase-model. Each phase is schedules by time and movement limits, which are maximally allowed to reach without jeopardize the tissue and tendon healing. At the same time the movement limits are a reference point for the therapy goals, so that at the end of six month rehabilitation all aims, which are defined by the International Classification of Functioning, Disability and Health (ICF), can be achieved. To verify this four-phase-model further studies are necessary.

PP242
KNEE DISLOCATION – THE POSTOPERATIVE APPROACH: CASE REPORT

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Introduction: Knee dislocations are traumatic injuries that can be limb threatening. Given the potential of neurovascular damage associated with this injury, this aspect should become the focus in a thorough evaluation. The popliteal artery, because of its attachments both proximal and distal to the knee, is injured in approximately 20% to 40% of all knee dislocations. The peroneal nerve can still be injured due to its anatomical location.
Purpose: Case report and pertinent literature review.
Methods: A 17-year-old healthy male presented to the emergency room following a one-meter high accidental fall. After a careful assessment, the left knee dislocation was promptly reduced. Neurovascular compromise was suggested by the clinical examination and doppler ultrasound with no distal flow in the left lower limb. Angio- TC revealed a traumatic laceration of the popliteal artery and haematoma.
Results: Vascular surgery performed successful revascularization and compartment decompression. Temporary transarticular external fixation during approximately 6 weeks was part of the orthopedic treatment for bone and soft tissues stabilization. The patient also presents a neurologic complication as a result of his trauma, maintaining foot drop on the left. Electromyogram confirmed a lesion involving tibial and common peroneal nerves. The postoperative period required a multidisciplinary approach and the patient maintained physiotherapy at our department, focused on range of motion and strength.
Discussion and conclusions: Knee dislocations are uncommon but with a high rate of associated neurovascular injuries and limb threatening complications that must be the focus of the initial management. Subsequently the goals are to maximize joint function, focused on range of motion, stability and strength. Patient outcome will vary depending on the associated injuries. This case report emphasizes the importance of a thorough initial assessment of the patient and the importance of an individualized rehabilitation program for the optimization of postoperative outcomes.

PP243
THE RESULTS OF RETROGRAD INTRAMEDULLARY ELASTIC NAILING IN THE TREATMENT OF PEDIATRIC FEMORAL SHAFT FRACTURES

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Introduction: Femoral fractures are leading cause of hospitalization due to fractures in children. When chosing appropriate treatment method of childhood femoral fractures, age, growing potential of the epiphysis, length of hospitalization and any other concomittant injuries play important role.
Purpose: To evaluate and present the clinical and radiological results of patients with femoral shaft fractures between age of 5-15 and treated with intramedullary titanium elastic nailing along with inpatient rehabilitation programme.
Method: 20 children (mean age 8,3 years) who applied to hospital due to femoral shaft fractures were included in this study. Etiology, location and type of fracture, time period untill admission to the surgery, length of hospitalization were noted. All cases were treated with retrograd intramedullary titanium elastic nailing. Beginning from post-operative first day, patients received an immediate inpatient rehabilitation programme including knee exercises and mobilization. Home exercise programme were prescribed after discharge. Patients were followed with anterior-posterior and lateral x-rays of both hip and knee for union. Lower extremity length inequalities and angular deformities were also noted . Flynn's criteria was used to determine functional outcomes, radiological and clinical results.
Results: Most common etiogy was high-falls(65%) and 90% patients had closed fractures. The average time of hospitalization was 3,4 days and follow-up was 14,5 months. There were complete reunion in all patients except for one case. There were no abnormal gait, inability to walk without crunches or pain during activity or rest. A valgus alignment developed in two cases, however no anterior-posterior anglings or rotational deformities were noted. According to Flynn's criteria 70% patients had excellent, 25% patients had good and 5% patients had fair results.
Discussion and conclusions: Intramedullary nailing along with inpatient rehabilitation programme is an appropriate treatment for childhood femoral shaft fractures providing early mobilization and early return to daily activities.

PP244
EFFECTIVENESS OF PHYSIOTHERAPY IN DIFFERENT APPROACHES FOR TOTAL HIP REPLACEMENT

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Introduction: The effects of physiotherapy on the mobility in total hip replacement (THR) performed via different surgical approach are being widely discussed.
Purpose: To evaluate functional recovery following the primary THR performed via the anterior versus posterior approach.
Methods: Patients, who were hospitalized for clinical routine rehabilitation after THR, were included. Examination was performed at the baseline and at the end of the physiotherapy program: on 7±1 day and 25±1 day post-operative. The following assessment has been performed: evaluation of pain intensity (SAS), range of motion in hip joint, thigh muscle strength by manual 5-point Lovett muscle strength evaluation method, Keitel functional movement test, 10 meter walk test, assessment of kinesiophobia by the Tampa Scale for Kinesiophobia (TSK) score. Patients were divided into 2 groups: Group I – patients who underwent THR through anterolateral approach, and Group II – patients in whom the surgery was performed using posterior approach.
Results: The study included 59 consecutive patients (mean age 70.3±8.3 years). At the end of physiotherapy program, pain intensity was 2.7±1.4 points in patients of Group I, versus to 1.1 ±1 point in patients of Group II. The scores of Keitel test was 24.2±4.1 points in the group that underwent anterolateral incision, while in the group underwent posterior incision the score was 27.5±2.4 points. At the end of routine physiotherapy program, an average TSK score was 38.4±5.8 points in Group I patients and 38.2 ±4.6 points in Group II. It was found that the average flexural thigh muscle strength was statistically significantly higher in the group with anterolateral versus posterior surgical approach (3.6±0.6 and 4.2±0.7 points, respectively).
Conclusions: In patients after THR a better effect of the routine rehabilitation was found in patients with posterior surgical approach compared to anterior approach.

PP245
"DUCK BEAK" AVULSION FRACTURE OF THE POSTERIOR TUBEROSITY OF THE CALCANEUS: TEN CASES REPORTS

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Introduction: Type II ("Duck beak") avulsion fractures of the calcaneal tuberosity are uncommon injuries so the literature about them is limited.
Purpose: To know the incidence, the outcome after surgery and the need for rehabilitation.
Methods: Retrospective review of all the calcaneus fractures diagnosed in our hospital in the last ten years.
Results: We found 10 "duck beak" fractures (4% of calcaneus fractures). They mainly affected women (90%) with an average age of 73,2 years. Half of the cases happened in the last two years. All fractures were treated with open reduction and internal fixation. One case was treated urgently because of signs of soft tissue suffering. Four cases presented post surgery complications, two of them regarding cicatrization. One case was diagnosed of pseudarthrosis, requiring the removal of the osteosynthesis material and bone resection with good outcome post surgery. Finally, there was a case of secondary displacement of the fracture that was reintervened. Three cases required a specific rehabilitation treatment. None of the patients needed orthopedic aids one year after surgery.
Discussion and conclusions: It is reasonable to expect an increase in incidence in the next years because of the ageing population and the rising prevalence of diabetes and osteoporosis. The displaced fragment produced by the Achilles tendon can endanger skin viability and can affect the later cicatrization. A specific rehabilitation protocol is often not needed.

PP246
TABOOS ON PHYSICAL EXAMINATION? THE PURPOSE OF A PARANEOPLASTIC ENCEPHALOMYELITIS

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Introduction: Paraneoplastic Neurological Syndromes (PNS) are associated with malignant tumors. Pathophysiology may be related to production of substances by the tumor, depletion of essential elements or the host response to the tumor itself. PNS are rare, occurring in <1% of cancer patients.
Clinical description: Male patient, with history of chronic depression, who gradually began lower limbs trembling, treated with risperidone.Due to alteration of consciousness and generalized tonic-clonic seizures, he was referred to hospital. Analytical workup showed leukocytosis and elevated CRP, CK, AST and ALT. It was interpreted as a Neuroleptic Malignant Syndrome and he was hospitalized for supportive care.After resolution of the iatrogenic condition, he was found AIS C spastic paraplegia. The neuroaxis-IRM revealed extensive signal-hyperintensity from T8-T9 to an indefinite lower limit. He was evaluated by PMR, started a physiotherapy program and conducted lower limbs BoNT/A chemodenervation. He was discharged home with an unclear etiology myelopathy diagnosis. Three weeks after discharge, he began fever, visual hallucinations, progressing to depressed level of consciousness, motivating re-entry into hospital. At this point, it was observed a massive right testicular mass, previously not perceived, and testicular tumor was suspected. He was promptly submitted to right radical orchiectomy. Histological analysis revealed a mature and immature teratoma and embryonal carcinoma presenting extensive necrosis.It was admitted the diagnosis of paraneoplastic encephalomyelitis, secondary to testicular cancer.
Conclusions: PNS are a diagnostic and therapeutic challenge. Clinicians should be alert for rapid detection and treatment of the underlying tumor. This entity should be screened with a complete medical history. This clinical case demonstrates the need for clinicians to do not neglect anamnesis and a detailed clinical observation. William Osler (1849-1919): “Do not touch the patient, first observe what you see (...) teach the eye to see, the finger to feel and the ear to listen”.

PP247
MIRROR WRITING AND READING AFTER BRAIN SURGERY, AN UNUSUAL PHENOMENON: CASE REPORT

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Introduction: Mirror writing is an unusual phenomenon, which is produced by writing letters, words, or sentences in the reverse direction of the natural way for a given language, so that they look normal when viewed in a mirror. Mirror reading is encountered even less frequently than mirror writing. A few cases of acquired mirror writing are accompanied by mirror reading, and these patients usually have extensive visuospatial deficits and left-right disorientation.
Purpose: To report the clinical case of a 70 year old, left-handed patient with acquired mirror writing and reading after neurosurgery.
Method: We present a case of a seventy year old patient diagnosed with left parietal meningioma who underwent neurosurgery. After surgery, the patient presented with transcortical motor aphasia, right-sided hemiparesis, left-handed mirror writing (letter, sentences, and numbers) and mirror reading.
Results: The patient's rehabilitation was coordinated by the Physical Medicine and Rehabilitation (PMR) department. She underwent speech, physical and occupational therapy. Improvements in speech and right-sided motor function have been documented. Her right-handed writing has normalized but stills presents with deficits of coordination and the occasional reversal of letters and numbers. Her left-handed mirror writing persists.
Discussion and conclusions: Pathologically acquired mirror writing is uncommon. Reported cases usually occur in the setting of stroke, trauma or toxic-metabolic injury. Mirror writing and reading has been poorly studied, which manifests itself in a lack of standardized treatment options and a paucity of epidemiological data. It seems that the rehabilitation plan has aided in the patient's progress. Further studies on mirror writing and reading and the breadth of impact that PMR has on the recovery process are needed.

PP248
COMBINED TREATMENT OF POSTANOXIC DYSTONIA: PHARMACOLOGICAL THERAPY, DEEP BRAIN STIMULATION (DBS) AND ONABOTULINUM TOXIN TYPE A (BONT-A). A CASE REPORT

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Introduction. Dystonia is a movement disorder characterized by involuntary hyperkinetic movements, agonist-antagonist co-contraction and abnormal postures.
Purpose. Scientific literature reports only few cases of DBS treatment in postanoxic generalized dystonia; the combined treatment (pharmacological therapy, DBS and BoNT-A inoculation) is never been described therefore we thought it useful to describe this clinical case.
Methods. The patient, male, aged 26 years, sustained a severe crush injury of the chest with cardiorespiratory arrest. Head MRI documented severe hypoxic damageof thalamus and cerebellum. The patient required sedation and mechanical ventilation. The reduction of deep sedation produced dystonic crisis with opisthotonus, opening mouth, tongue protrusion, pelvic floor dystonia, tachycardia, hypertension, sweating. Given the high risk of death, the patient required deep sedation and ventilation again. One month later, the head MRI documented a more extensive brain hypoxic damage involving also basal ganglia. Pharmacological therapy with baclofen, gabapentin, dantrolene, clozapine was introduced in order to reduce the dystonia. Thanks to the treatment, the sedation was gradually interrupted but the episodes of dystonia did not disappear. A literature review suggested the experimental use of DBS implanting electrodes into the globus pallidus; during the three months of stimulation were tested different polarity, frequency and intensity in order to find the best parameters. The pharmacological treatment associated with DBS reduced the frequency of crises but not their duration and intensity. The chemodenervation with BoNT-A was added to drugs and DBS. The inoculated muscles with high dose of botulinum toxin were superficial and deep neck muscles bilaterally.
Results. The pharmacological treatment associated with DBS and BoNT-A drastically decreased the occurrence of severe generalized dystonia. The patient began the rehabilitation therapy.
Discussion and conclusions. The experimental combined treatment contained dystonia crises, improved the prognosis “quoad vitam” of the patient. Therefore this treatment allowed to start a customized rehabilitation program, improving the patient’s quality of life.

PP249
REHABILITATION OF PATIENT WITH HEMIPLEGIA AND TERSON'S SYNDROME (CASE REPORT)

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Introduction: Tesron's syndrome is characterized by most authors as the coexistence of subarachnoid hemorrhage (SAH) with intraocular hemorrhage. The precise mechanism of development of the latter has not been fully clarified. Terson's syndrome is often associated with lower Glascow Coma Scale, higher Hunt and Hess scale and with higher mortality rates. Timely diagnosis of Terson's gives the possibility of surgical treatment, whenever is needed, improves the rehabilitation outcome and limits complications.
Case Report: Forty years old male with sudden onset headache, vomiting followed by loss of consciousness. Imaging revealed Intracerebral Hemorrhage (ICH) and SAH. Initially, he was treated surgically. He was hospitalized for 4 months in the ICU and Neurosurgery Department, then the patient was admitted to the PRM department. During his hospitalization in the PRM department he followed a rehabilitation program, with regular consultations by neurosurgeons, ophthalmologists and psychiatrists. The patient was diagnosed with Terson's syndrome (bilateral vitreous hemorrhage) 3 months after the initial event and conservative treatment was decided with regular ophthalmologic consultations. The rehabilitation program was prolonged due to his severe motor and mainly to his sensory deficit (initially complete blindness) and psychiatric complications. For social and geographical reasons the patient continued his rehabilitation in another PRM department (closer to his home) for 3 more months. After his discharge (10 months after the initial event) the patient was able to ambulate on level ground with an articulated ankle-foot orthosis and three point cane and he could perform the majority of activities of daily living under supervision.
Conclusions: In patients with SAH we should always consider Terson's syndrome. Terson's syndrome incidence varies widely from 8 to 40% in the literature; timely diagnosis and treatment even in non-cooperative patient (coma), limits complications and facilitates the rehabilitation program.

PP250
THE ROLE OF EXERCISE AFTER TRAUMATIC BRAIN INJURY

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Introduction: Traumatic brain injury is defined as a head injury, with or without loss of consciousness, that results in a temporary impairment of brain functions. There is some evidence that physical activity can promote cognitive rehabilitation with a positive impact on memory and learning after traumatic brain injury. Purpose: To evaluate the role of exercise after traumatic brain injury, its benefits and indications.
Methods: Review of the literature published until October 2015 in Medline, Cochrane Library and Scopus databases.
Results: Exercise post-traumatic brain injury increases neurogenesis and improves learning and memory. Physical activity improves cerebral blood flow, modulates inflammatory responses and reduces lesion size. Low-intensity aerobic exercise has been demonstrated to have a positive impact following mild traumatic brain injury. Individuals with chronic nonpenetrating traumatic brain injury can perform supervised vigorous aerobic exercise training with cardiorespiratory fitness benefits and reduction of fatigue. However, it is not recommended to return to high-risk activities soon after injury because of vulnerability to reinjury. It is prefer gradual return to activities as tolerated and it is strongly recommend starting a return to school/work as soon as possible. Activities should be gradual and at a pace that does not exacerbate symptoms. There is limited evidence that rest improves outcomes from this injury. Moreover activity restriction itself may contribute to slow recovery. Individualized and graded exercise programs have been shown to promote return to normal functioning.
Discussion and conclusions: Exercise aids neuro and motor rehabilitation after mild, moderate and severe traumatic brain injury. Despite promising findings and evidence from studies, further studies are needed to understand which subpopulations are most likely to respond to exercise, the specific timing of exercise intervention, how exercise can promote neural plasticity and what intensity and frequency of stimulus is needed to maximize functional benefit.

PP251
HYPEROSMOLAR HYPERGLYCEMIC STATE RELATED TO INSULAR INFARCTION ACCOMPANIED BY DYSPHAGIA: A CASE REPORT

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Introduction Hyperosmolar Hyperglycemic State(HSS) can be a life-threatening medical emergency. HHS is usually related to complication of diabetes decompensation, especially in type 2 diabetes. Whether HHS can be caused by an occult lesion in the insula, which may contribute to sympathoadrenal dysregulation and voluntary swallowing, has not been reported yet.
Objective To evaluate the relationship between HHS with insular infarction to dysphagia.
Methods Medical records of a 62-year-old male with decreased mentality who initially admitted to the endocrinology department of our institution was reviewed.
Results The patient's initial blood glucose level was 1275 mg/dL and serum osmolality of 376 mOsm/kg with electrolyte imbalance indicated of HHS. After fluid supplementation with administration of insulin, his mental status recovered. The patient was consulted to our department for dysphagia. Videofluoroscopic Swallow Study(VFSS) showed dysphagia of severe degree especially at pharyngeal phase with poor airway protection. After the patient was transferred to our department for rehabilitative dysphagia therapy, despite improvement of general condition, the patient's dysphagia did not improve. Although the patient showed no hemiparesis, facial palsy or tongue deviation, magnetic resonance images (MRI) of brain and diffusion images showed acute infarction involving right insular cortex. Dual antiplatelet therapy with aspirin and cilostazol was started. After 3 weeks of dysphagia therapy, swallowing performance was improved and he was able to start stable oral feeding.
Discussion and conclusions Our case shows a patient with uncontrolled plasma glucose level with HSS accompanied with dysphagia, related to an occult insular infarction. This case report shows that HSS may be related to an occult brain lesion, especially in the insular region. Uncontrolled plasma glucose level, and other sympathoadrenal dysregulation with the presence of neurogenic dysphagia, in the absence of other weakness or other neurological signs, should raise suspicion of an occult brain lesion in the insular area.

PP252
FEASIBILITY AND EFFECTS OF AN ORAL SWALLOWING CARE PROGRAM ON SWALLOWOING AND ORAL INTAKE STATUS FOR PATIENTS WITH PROLONGED ENDOTRACHEAL INTUBATION

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Introduction: Estimated 62% of patients who had been intubated over 48 hours experienced post-extubation dysphagia. Intervention is needed but studies are lacking in this regard.
Purpose: The purpose of this pilot trial was to develop and test an Oral Swallowing Care Program (OSCP) for patients (aged 50 and older) who had prolonged (48 hours) oral endotracheal intubation.
Methods: We employed a before-and-after-intervention study with a historical control. Subjects were enrolled from six medical intensive care units at a medical center in Taipei, Taiwan. Subjects with prior swallowing difficulties, oropharyngeal structural deficiency, neurological disease, tracheostomy, and on absolute quarantine were excluded. Subjects enrolled before January, 2015 were served as a control group (n=127), only receiving usual care. Subjects enrolled after January, 2015 were served as an experimental group (n=55), receiving OSCP, a 2-week, once-daily, swallowing program including moisturizing and cleansing oral cavity, salivary gland massage, oral motor exercise, and intake education. Subjects were followed 21 days post-extubation. Compliance to the OSCP, tongue strength, salivary secretion, oral health status, bedside swallow evaluation (BSE; swallow 50-ml of water without difficulty), and oral intake status were the primary endpoints.
Results: Compliance rate to the OSCP was up to 71.4%. Subjects receiving OSCP had better performances on tongue strength, saliva secretion, and oral health status on the 7th day post-extubation. Subjects in the experimental group took less days to resume total oral intake with no restrictions than those in the control group (p=0.027). However, there was no significant improvement on the days needed to pass BSE.
Discussion and conclusions: The OSCP was safe and feasible. The effect of OSCP on improving tongue strength, saliva secretion, oral health status and reducing time to resume total oral intake with no restrictions was evident. More analyses are needed to ascertain the effect of OSCP.

PP253
PHYSICAL TREATMENT OF QUADRIPARESIS SPASTICA CAUSED BY INTENSIVE CARE INFECTION OF LEGIONELLA PNEUMOPHILA: CASE REPORT

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Background: Legionella pneumophila (LP) cause an acute fibropurulent pneumonia with alveolitis and bronchiolitis which can lead to respiratory failure as complication. In a long-term study of 122 survivors of LP in the Netherlands, symptoms of fatigue (75%), neurologic symptoms (75%), and neuromuscular symptoms (79%) had persisted 17 months later.
The aim of the study was to present a case report of physical treatment of quadriparesis spastica as a complication of intensive care of LP pneumonia.
Case report: Male patient 33 years old was referred to the physical therapy and rehabilitation in the Institute "Dr Simo Milosevic" Igalo, Montenegro due to general muscle weakness after history of LP pneumonia, ARDS and ECMO treatment one month ago. On admission the patient has reported the presence of weakness muscles of trunck and extremities, fatigue, thoracal pain more to the left, occasionally shortness of breath, very low tolerance effort and indipedent mobility by somenone's help (uses a wheelchair). Neurological consultation: left SCM hypotrophy and reduced strength, schoulder belt hypotrophic with progressive arms muscle hypotrophy, coarse tremor outstretched hands with weakened coarse motor strength; legs muscle hypotrophy, progressive in distal direction with bilateral drop foot. Pulmological consultation: mixed pattern with dominatly severe restrictive pattern (FVC 49%, FEV1 48%). Intensive physical therapy lasted 15 treatment days and consisted of individual hydro kinesi twice a day, respiratory kinesi and manuel massage. The discharge condition has improved: patient independently moveable, significantly enhanced trunck and extremities muscles and improve spirometry to moderately severe restrictive pattern (FVC 53%, FEV1 51%).
Conclusions: It is not uncommon for patients with Legionnaires' disease to be admitted to the intensive care unit. Some will suffer long-term impaired health-related quality of life. Physical treatment, individually doses as soon as possible can speed up recovery of fatigue, neuromuscular and respiratory symptomes.

PP254
THE THREE-MONTH REHABILITATION OF THE PATIENT AFTER HAVING OPERATED THE ANEURISM OF THE LEFT ICA AND AFTER THE III, IV AND VI CRANIAL NERVE IMPAIRMENT

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Introduction Oculomotor nerve palsy is an eye condition resulting from damage to the third cranial nerve or a branch thereof. Third nerve damage weakens the muscles innervated by the nerve . Also adversely affect the fourth and sixth nerve , causing impairment of their activity. Rehabilitation third nerve palsy is rarely described in the available literature . The whole process is very difficult , but the effects of physiotherapy is very beneficial for the patent.
Purpose The assessment of the influence of the outpatient rehabilitation on the patient's condition after a three-month treatment and the use of physical therapy.
Methods Case studies of the 38-yerar-old patient after having operated a big aneurism of the left ICA, which was clipped. After the procedure, the III, IV and VI cranial nerves were deeply impaired and the amnesic aphasia occurred. The patient started the rehabilitation a month after the incident. To assess the process of rehabilitation, the own movement examination of the eyeball was implemented. Active and passive exercises, Trigger Point therapy, kinesiotaping, laser and electrostimulation were inserted.
Results The significant improvement of the eyeball movement has been proved on the basis of the same own examination. A physiotherapy has had a positive influence on the speech disorder, namely amnesic aphasia, and after the month of the rehabilitation it has been completely removed. The positive influence of the rehabilitation, which has been pointed out, is clinically essential.
Discussion and conclusions Obtained results have not been described in literature yet, that is why it is essential to widen further research and emphasise the importance of the rehabilitation, which is rarely implemented in an intense way in such medical conditions.

PP255
ENCEPHALOPATHY IN ACUTE INPATIENT REHABILITATION AFTER LEFT VENTRICULAR DEVICE PLACEMENT IN A 69 YEAR OLD MALE: A CASE REPORT

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Introduction: 69 year old male with past medical history significant for coronary artery disease status post four vessel coronary artery bypass graft in 1998, atrial fibrillation with dysrhythmias status post automatic implantable cardioverter defibrillator placement, renal cell carcinoma, congestive heart failure with ejection fraction of 25% and ischemic cardiomyopathy underwent left ventricular assisted device placement. Post operatively, patients hospital course was complicated by respiratory failure secondary to flash pulmonary edema, requiring prolonged intubation. Encephalopathy with psychosis was noted. Patient also developed acute renal failure, patient was subsequently placed on hemodialysis. Multiple deep vein thrombosis were also found in patient s left subclavian, axillary, brachial and internal jugular for which patient was placed on anticoagulation. Once patient was medically stabilized patient was transferred to acute inpatient rehabilitation for functional upgrading. Patients encephalopathy was treated with atypical antipsychotics, neuropsychology and speech therapy.
Purpose: Effects of acute inpatient rehabilitation in treating LVAD encephalopathy.
Methods: We evaluated patients cognitive function by assessing his FIM score.
Results: Patients admission cognitive FIM(functional independence measure) was 18. Upon discharge after intervention patients FIM was 27.
Discussion: Encephalopathy after LVAD placement is a rare complication. The normal flow that is introduced by the LVAD is thought to create hyperperfusion in these patients. The hyperperfusion is believed to overwhelm cerebral auto regulation resulting in encephalopathy.
Conclusions: Encephalopathy after LVAD placement presents a unique challenge for physiatrist. Patients who experience encephalopathy after LVAD placement require a comprehensive rehabilitation program to achieve independence. The program implemented for this patient included management of the LVAD device by all disciplines. This patient increased his cognitive FIM score by 9 and was able to be manage his LVAD device independently upon discharge home.

PP256
NEUROCOGNITIVE DYSFUNCTION ACCORDING TO TERRITORY OF HYPOPERFUSION IN PATIENTS WITH MOYAMOYA DISEASE

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Introduction: Moyamoya disease (MMD) is characterized by progressive stenosis of the major arteries of the Circle of Willis, resulting in compromised cerebral blood flow. Many previous studies reported that large proportion of MMD patients demonstrate disruption of neurocognition, particularly those mediated by subcortical and frontal regions. It is not yet known to what extent cognitive impairment in MMD is the consequence of ischemic damage to cerebral gray matter and/or dynamic factors such as cerebral hypoperfusion.
Purpose: To demonstrate the relationship between territory of hypoperfusion and cognitive impairment in MMD.
Methods: MMD patients over 18 to 60 years of age referred to department of rehabilitation medicine were included. Baseline characteristics and disease related factors such as age, gender, age of onset, symptom duration, number of events, lesion side on angiography, whether patients received operation and K-MBI score was assessed through medical record. We reviewed all of enrolled patients' brain SPECT and classified patients by existing territory of hypoperfusion on brain SPECT. Then we compared characteristic of computerized neuropsychological test (CNT) results between two groups.
Results: We recruited 26 MMD patients without focal stroke or cortical lesion and those who could conducted CNT. There was no statistical difference in age, gender, number of events, age of onset, symptom duration, number of events, lesion side, whether patients received operation and K-MBI score between two groups. Patients with frontal and parietal lobe hypoperfusion showed lower scores in visual CPT, auditory CPT, forward digit span test, backward digit span test, verbal learning test, trail making test compared to patients without hypoperfusion on brain SPECT.
Discussion and conclusions: MMD patients with hypoperfusion in frontal and parietal lobe showed lower scores of CNT results in MMD patients without focal stroke. Therefore, hypoperfusion territory on brain SEPCT is related with characteristics of neurocognitive dysfunction in MMD patients.

PP257
SIGNS AND SYMPTOMS: SWELLING AND PAIN IN THE ARM - IN SEARCH OF A DIAGNOSIS

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Upper limb signs and symptoms such as pain, swelling and dysfunction can appear in a myriad of diseases. These manifestations are frequently associated with brachial plexus trauma, but in some cases this relation is not evident. The incidence of disautonomic signs and symptoms of upper limb without confirmed brachial plexus injury is 0,6 per 100 000 adults. We show a case of complex diagnosis and treatment of signs and symptoms of upper limb, without definite etiology. A Caucasian 55-year-old women, with history of central nervous system autoimmune chronic disease with right flaccid paraparesis experienced left arm trauma by mechanical traction with consequent pain on left shoulder. After six weeks, she started developing distal edema and functional disability. Objectively she presented with a slightly adducted left scapula, distal cylindrical swelling of the arm, decreased muscle strength on lateral, anterior and posterior elevation of the arm, pain on passive mobilization of the shoulder, numbness and allodynia in the territory of C5-C6 dermatome. Left cervical Lasègue was positive. Cervical and shoulder X-ray, shoulder and axillary ultrasound and cervico-axillary MRI showed no morphological changes. Electromyography was negative for abnormalities in brachial plexus. After six months of rehabilitation and neuromodulation treatment the patient showed functional improvement but the pain and edema remain unchanged. In conclusion, persistent upper limb signs and symptoms not always rely on established brachial plexus injury.

PP258
SYSTEMIC LUPUS ERITEMATOSUS ASSOCIATED TRANSVERSE MYELITIS – A RARE CASE

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Introduction: Systemic Lupus Erytematosus (SLE) is a multi-systemic auto-imune inflammatory disease with an unknown etiology. The pathophysiology is explained by the deposition of immune complexes in several organs which triggers inflammation. Neurological manifestations are reported in 25 to 75% of the cases and can involve any portion of the nervous system, being headaches and cognitive impairment the most frequent clinical manifestations. Transverse myelitis is estimated to occur in 1 to 2% of the patients and is usually a late complication but can also be the first clinical finding.
Purpose: We report a case of a 47 year old which was diagnosed with SLE associated transverse myelitis and with hematological, renal (membranous lupus nephritis), pericardial and pleural involvement. At admission we reported a neuro-motor status of AIS D paraplegia, with impaired proprioceptive sensitivity in both feet, urgent voiding and incontinence. Walking index for spinal cord injury (WISCI II) was 16. Functional Independence Measure (FIM) was 97.
Methods: We proposed an intensive rehabilitation program focusing on Neurogenic Bladder, with urodynamic investigation and re-education, muscular strengthening of the lower limbs and trunk, gait re-education and sexual advising, maximizing his functional independence.
Results: After 58 days of rehabilitation our patient was discharged with an overlapping AIS and WISCI II score, FIM was 117 and he initiated intermittent catheterization and antimuscarinic therapy for Neurogenic Detrussor Overactivity (NDO), preventing addicional damage to the upper urinary tract and incontinence.
Discussion and conclusions: The etiology of Transverse myelitis is wide and it may have a dramatic evolution. In this specific case our goals were directed towards the functional independence and kidney function protection. This case mirrors the importance of a multidisciplinary rehabilitation program focused on the whole changes associated with medular lesion. Our patient is now fully independent and able to carry on with his previous projects.

PP259
BENEFITS OF INCOBOTULINUM TOXIN TYPE A IN NEUROPATHIC PRURITUS: CASE REPORT

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Introduction: Neuropathic pruritus is a common condition but unfamiliar to many physicians. It is caused by peripheral or central nervous system lesion but physiopathological mechanisms are still poorly understood. Symptoms can be disabling and many treatments were tried with unsatisfactory results. We report the first case in which neuropathic pruritus caused by a cns lesion (multiple sclerosis (MS)) was relieved after BoNT/A injection.
Case: A 57-year-old white male presented to a BoNT/A appointment for evaluation and treatment of spastic tetraparesis due to MS. Additionally he presented a bilateral neuropathic itch in the inguinal regions, mainly at night just before falling asleep, for which he needed oral medication (hydroxyzine 12,5 mg PRN at pruritus onset). Nonetheless, he complained that the therapeutical effect was unsatisfactory due to a 20 min latency period during which he had unbearable itch. After he consented to an off-label use, BoNT/A was injected in the dermis of both inguinal regions. As primary outcome we measured pruritus intensity (VAS) during the hydroxyzine latency period. Frequency, duration, degree, direction, and disability dimensions were evaluated as secondary outcomes using Likert scales based on the "5D itch-scale". Outcomes were evaluated at 1-week, 1 and 3-months post-treatment. An intradermal injection of 50 U of incobotulinumtoxinA in each inguinal area was given. One-week after, pruritus intensity reduced from 9 to 2 on VAS. Frequency, duration, degree, and disability (4 to 2) also improved. Benefits were maintained at the 1-month but not on the 3-months evaluation. No adverse effects were reported.
Conclusions: Published studies on the applicability of BoNT/A for neuropathic itch are scarce. We report a case of a MS patient suffering from disabling neuropathic itch that got relieve after BoNT/A treatment. Further investigations are necessary to determine if BoNT/A can be an option for neuropathic pruritus refractory to oral medication.

PP260
REHABILITATION OUTCOME AFTER TETRAPLEGIA DUE TO ACUTE DISSEMINATED ENCEPHALOMYELITIS (ADEM): A CASE REPORT

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Introduction: ADEM is a rare, immune mediated, demyelinating disease of the Central Nervous System, resulting in multifocal signs and symptoms and usually following a virus infection.
Purpose: To present the rehabilitation program, problems and outcome of a young man with tetraplegia due to ADEM, admitted to our center.
Case report: A 26-year-old man, being comatose, was admitted to the Neurological Department of a General Hospital on 07/03/2012. He had sudden onset of headache 2 days ago, without fever. Head CT scans showed diffuse cerebral edema and right to left midline shift. He was transferred to the ICU and underwent decompressive craniectomy. Tissue biopsy revealed disseminated, demyelinating encephalomyelitis. Finally, he was admitted to our center on 20/08/2012, presenting with tetraplegia, having a tracheostomy and PEG tube. His FIM+FAM and MMSE score on admission were 46/210 and 22/30 respectively. He followed an intensive rehabilitation program including physiotherapy, speech therapy, occupational therapy, hydrotherapy, robot-assisted therapy and psychological support.
Results: During rehabilitation, complications included mainly infections: respiratory, of urinary tract and blood stream (2 episodes). His neurological status improved gradually, with left hemiparesis predominating. The tracheostomy tube was removed on 05/10/2012 and the PEG tube on 11/10/2012. Mental functions also improved (MMSE on discharge: 30/30). He was discharged on 06/05/2013, walking independently (without any aid), being independent in most of the activities of daily living (FIM+FAM score: 205/210).
Conclusions: Patients' needs and rehabilitation goals change during time. Initially, priority goals include vital functions' maintenance, infection control, tracheostomy tube and gastrostomy tube removal. Remaining mobility problems and cognitive disorders may hinder social reintegration.

PP261
THE IMPORTANCE OF THE PHYSIATRIST – AMYOTROPHIC LATERAL SCLEROSIS, A CASE REPORT

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Introduction: It is frequent in the daily practice to find patients who have been evaluated by multiple doctors in different fields of medicine and still arrive to our consultation undiagnosed or even misdiagnosed.
Purpose: To state the importance of the Physiatrist in the differential diagnosis of many complex diseases, like amyotrophic lateral sclerosis (ALS).
Methods: It is a case report of an 80-year-old woman, without relevant past medical history and taking any medication up to the date of the first consultation in Physical Medicinal and Rehabilitation (PM&R). She had been previously seeking many doctors, of different specializations (including Family Medicine, Otorhinolaryngology, Gastroenterology), due to frequent dysphagia, even with her own saliva, leading to episodes of labial cyanosis, lasting for 6 months. While taking the medical history she also reported walking difficulty, progressively worsening for the past 3 months, when she started to use a walker. A CT scan of the brain has been previously done, showing discrete evidence of ischemic leukoencephalopathy, without evidence of recent stroke or space-occupying lesion. An esophagogastroscopy has also been done, revealing a dysfunctional lower esophageal sphincter.
Results: At physical examination, the patient presented: dysarthria, tongue atrophy and fasciculations, loss of muscle strength predominantly on the proximal segment of the right upper limb and on the left lower limb, positive Babinski sign on the right, and hyperreflexia on both upper and lower limbs. Having the suspicion of motor neuron disease, an electromyography was ordered, confirming the diagnosis of ALS.
Discussion and conclusions: In this case, the role of the Physiatrist was extremely important, connecting all the disperse information and carefully evaluating the patient, leading to the correct diagnosis of the underlying disease, even if it has a desperately bad prognosis. The patient started a rehabilitation program and was referred to Neurology.

PP262
UNCOMMOM CAUSE OF ATAXIA OR AREFLEXIC BLADDER, TABES DORSALIS. CASE REPORT

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Case Diagnosis Tabes dorsalis with sensory ataxia and sudden areflexic bladder.
Case Description A 61-year-old man was referred for a sudden onset urinary difficulty and gait disturbance. On urodynamic study, the result was areflexic bladder. He showed positive Romberg test, positive heel to shin test and ataxic movement. Muscle power of bilateral lower extremities was good grade checked. There were perianal sensory discrimination and bilateral L2-S1 dermatome sensory discrimination on all sensory modality. There was no upper motor neuron sign. On L-spine MRI and brain MRI, there was no abnormality. On electrodiagnostic study, there was no abnormality except absent bulbocarvenosus reflex. And posterior tibial and pudendal somatosensory evoked potentials were absent. As differential diagnosis of acute onset sensory ataxia and areflexic bladder, we considered about subacute combined degeneration, hypocupric myelopathy, tabes dorsalis and retrovirus-associated myelopathies. So we performed laboratory studies including vitamin B12, folate, HIV viral marker, hepatitis B and C viral markers, CSF analysis, non treponemal and treponemal test. Then the results of laboratory studies were reactive VDRL – RPR, TPHA, FTA-Abs Ig G on serum and CSF. And CSF analysis showed lymphocytic pleosytosis. So we diagnosed him for Tabes dorsalis.
Discussion The term "neurosyphilis" refers to infection of the central nervous system (CNS) by Treponema pallidum. General paresis and tabes dorsalis are considered "tertiary" forms of neurosyphilis. Tabes dorsalis, uncommon in the modern era, is a disease of the posterior columns of the spinal cord and of the dorsal roots. The frequency of the late forms of neurosyphilis has declined in the antibiotic era, with the result that these forms, particularly tabes dorsalis, are now uncommon.
Conclusions Patients presenting with lower urinary tract obstructive symptoms or sensory ataxia, we should considering about neurosyphilis. This case report emphasize the need for remaining alert to syphilis in patients with ataxia or areflexic bladder.

PP263
MELORHEOSTOSIS. CASE REPORT

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Introduction Melorheostosis is a degenerative, incurable, painful and rare disease that affects both sexes with a prevalence of 0.9 / 1.000.00 people, generally occurs between the second and third decade, is characterized by thickening of cortical bone that causes severe functional limitations. There are two theories of origin: sensory nerve abnormality sclerotome or loss of function mutation of the gene LEMD3. Clinically, it may have: stiffness, muscle spasms, abnormal pigmentation as well as fibrosis, muscular atrophy and linear scleroderma. The lesions usually affect one member, being more common in the lower limb. The diagnosis is usually made by radiography, computed tomography, magnetic resonance imaging and scintigraphy. Radiography is characterized by apparently melted candle wax. To confirm the diagnosis marrow biopsy and microbiological study of affected tissue is performed.
Purpose Disseminate information infrequent clinical diagnoses in work activity and discuss differential diagnoses.
Clinical Case 60 years old patient who complains of sore right knee flexion and extension deficit and functional limitation. In exploration knee deformity. Bone tumors are seen in anterior tibia and dorsum of the foot. Joint range of knee extension -20º and flexion: 90º. With very limited mobility ankle plantar flexion only 10º. Received analgesic treatment based on electrotherapy and exercises to avoid flexion, global empowerment was prescribed. Orthopaedic footwear.
Conclusions The Melorheostosis is a benign entity, usually chronic course with periods of exacerbation and remission. This case as rare disease arises as to be taken into account before diagnosis as osteopetrosis, osteopoikilosis, striated osteopathy, infantile cortical hyperostosis, osteomyelitis, osteomas and tumors. Treatment is symptomatic and is aimed at controlling musculoskeletal pain. In cases of severe deformity or functional limitation resection surgery may be necessary.

PP264
ONE IN EIGHT MILLION – A PROGERIA CASE

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Introduction: Progeria or Hutchinson – Gilford syndrome is a rare disease, characterized by a premature and accelerated aging in 7 to 10 times. The estimated prevalence is 1 in 4 to 8 Million newborns, with a total of less than 150 cases reported worldwide. The disease is associated in 80% of the cases with a punctual mutation in LMNA gene, that encoded an essential protein of nuclear membrane and chromatin regulation, Lamin A. There is no known cure.
Clinical case: Caucasian, 17 years-old female, diagnosed with progeria at 17 months, presenting with total alopecia, crania-facial disproportion, prominent eyes, swollen cranial veins, thin skin, tooth eruption delayed, low body fat, dystrophic nails. At the age of eight she was included in a clinical essay with a farnesyltransferase inhibitor (lonoform) in Boston Children's Hospital and Progeria Research Foundation. She has follow-up of ophthalmology, otolaryngology, stomatology, orthopedic, podiatry, nutrition, cardiology, endocrinology and physical medicine and rehabilitation at her residence zone. Along the natural history of the disease, she presented sproradic/recurrent arthralgia, limited range of motion and dependence in daily living activities She attended physiotherapy, hidrocinesiotherapy and occupational therapy, weekly. Addind that, she underwent a specific rehabititation program aimed to treat orthopedic lesions such as a shoulder dislocation or most recently, a traumatic fracture of tibia and fibula.
Discussion and conclusions: Although the average age of death is 13 years old, the patient is now 17, and luckily she is passing through all the usual puberty problems, with a very busy social life, revealing a good acceptation of her condition. The present case highlights the importance of continuous rehabilitation as a contributor to the patient´s quality of life and the delay of the progressive dependence status.

PP265
OROFACIAL MOTRICITY DYSFUNCTION AND TOXIN BOTULINUM: CLINICAL CASE

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Introduction: Communication disorders in CP are thought to be commonplace and the result of a complex interplay between motor impairment, swallowing and drooling difficulties, intellectual impairment, and vision and hearing impairment, which can further limit the child's abilities. Speech and language therapy is the most used but other treatments have also been described such as pharmacologic agents, Intrathecal Baclofen Therapy, Deep Brain Stimulation and botulinum toxin which offers symptomatic and temporary therapeutic effects.
Purpose: Improve communicative impairments of a cerebral palsy patient.
Methods: 13 Years old male, with dyskinetic cerebral palsy level II of Gross Motor Function Classification System. He presented orofacial motricity dysfunction, with mouth involuntary movements and dysarthrophonia. The patient was submitted to two sessions of facial muscles botulinum toxin type A infiltrations to improve his communications impairments. Speech therapy exercises were thought for home practice and were supervised by family and school teachers. We have recorded on video the clinical presentation before, during and after the treatment.
Results: The therapeutic goals were been achieved as the patient has improved his speech phonation, rate and intelligibility. The interaction with other children improved as well as his communicative participation in social, educational and family activities.Simple activities as phone calls are now possible.Overall he reported a significant improvement in his quality of life.
Discussion and conclusions: Toxin botulinum toxin is known for its paralytic effects on the human voluntary musculature via inhibition of acetylcholine release at neuromuscular junctions. It has many clinical uses and even cosmetics ones. The presentation of this clinical case, and its videos of the patient speech before and after the botulinum toxin, as well as the technique injection, shows one of the botulinum toxin clinical use that was very important to the communication of the patient.

PP266
DEFICIT OF NEUTRAL FACIAL EXPRESSION RECOGNITION BETWEEN CHILDREN WITH HIGH-FUNCTIONING AUTISM AND TYPICAL PEERS AGED 7-11

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Background and aim: Individuals suffering from Autiestic spectrum disorder are impaired in interpersonal and social skills highly due to deficiency in facial emotion recognition. The objective of this study was to compare this ability between children with High-Functioning Autism with Typical peers. Comparing recognition of neutral state was used for the first time.
Materials and methods: Twenty seven High-Functioning Autism and 27 Typical boys between 7 and 11 years of age who were matched based on age, and performance, verbal and overall IQ participated in this study. Comparison of neutral face and facial emotions, including fear and surprise was made using a computerized researcher-made test in MATLAB software. A repeated measures ANOVA and an independent t-test were used for statistical analysis using SPSS software version 19.
Results: There was a significant difference between the two groups in terms of facial emotion recognition ($F(1,50) = 7.288$, $p = 0.009$). The difference was significant in the recognition of neutral face with female gender ($t = 2.574$, $p = 0.013$). There was no difference in reaction time between groups ($F(1,50) = 4.002$, $P = .051$). Differences in reaction time in both groups and in three facial expressions were observed in male targets ($t = -2.305$, $p = .025$), ($t = -2.160$, $p = .035$), ($t = -2.654$, $p = 0.011$).
Conclusions: In recognition of neutral faces with female gender targets, people with High-Functioning Autism performed weaker than typical peers and their reaction time were increased in male gender targets.

PP267
EARLY PREDICTION OF CEREBRAL PALSY

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Introduction. Early diagnosis of cerebral palsy (CP) is still a challenge for clinicans and researches.There are numerous methods for detection of early signs indicating neurodevelopmental disorders in high risk infants. Recent studies have shown that heart rate variability (HRV) analyses could give useful information regarding infant`s functional integrity of the central nervous system (CNS). Furthermore a pattern of HRV was demonstrated to correlate with neurodevelopmental outcome in high risk infants.
The purpose of this study was to assess predictive value of time-domain HRV parameters in infants with neurodevelopmental abnormalities.
Methods. The study included 16 infants with neurodevelopmental disturbances and 19 healthy age and sex-matched controls. Time-domain HRV indices were analyzed from 24-h electrocardiography recordings. Analyzed parameters were: SDNN, SDANN and RMSSD. (SD=standard deviation, NN interval= the length between two successive heart beats, SDNN = standard deviation of all NN intervals; SDANN =standard deviation of the averages of NN intervals in all five-minute segments; RMSSD =square root of the mean of the sum of the squares of the differences between adjacent NN).
Results. Significantly lower values of SDNN, SDANN and RMSSD were found in infants with neurodevelopmental disturbances compared to controls. Additionally, logistic regression analyses demonstrated independent predictive value of parameters SDNN and SDANN in infants who subsequently developed CP. The optimal cut-off value of SDNN <=48 ms predicted CP with sensitivity of 68% and specificity of 84%, while optimal cut-off value of SDANN<=41ms predicted CP with sensitivity of 87% and specificity of 58%.
Conclusions. Time domain HRV analyses might serve as a noninvasive and clinically applicable biomarker predicting infant`s future neurodevelopmental outcome.

PP268
PHYSICAL AND REHABILITATION MEDICINE IN CONGENITAL HIP DYSPLASIA, CASE REPORT

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Introduction Up to 4% of all neonates in Central Europe are born with congenital hip dysplasia and they will not develop normally if they remain unstable or with an anatomical abnormality until the age of gait.
Purpose The authors report a case of inveterate dislocation of right hip submitted to several surgical procedures.
Methods A 16 months girl with a history of right congenital hip dysplasia was evaluated in a Physical Medicine and Rehabilitation consultation.
Results The patient was sent to our department following the diagnosis of right congenital hip dysplasia detected through a screening consultation (23/July/2014). Subjected to Bryant's traction with closed reduction and immobilization with spica casting (28/July/2014). Because of a relapse dislocation, she was submitted to a new traction, with open reduction and immobilization with spica casting (7/November/2014). Due to a second relapse, she underwent arthrography and open reduction by anterior approach, with kirschner wire fixation (30/January/2015). As a result of a new reduction loss, she underwent open reduction by anterior approach and Kirschner wire fixation plus immobilization with spica casting (4/May/2015). Currently she has a marked limitation of hip mobility. Psychomotor development within the normality (excluding gait). Physical examination showed no alterations of the spinal statics. Left hip with complete active range of motion. Right hip in an abduction position (about 40º), hardly reducible. In prone position, with the right inferior limb in abduction and extension, with difficulties to remain in this position (unable turn around and uncomfortable). Good trunk control.
Discussion and conclusions The authors want to draw attention to the importance of Physical Medicine and Rehabilitation regarding functional recovery of the child, both in terms of gain of range of motion, as well as in terms of maintenance of orthostatic position and gait.

PP269
EFFECTS OF LATERAL ELECTRICAL SURFACE STIMULATION ON SCOLIOSIS IN CHILDREN WITH SEVERE CEREBRAL PALSY

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Introduction Scoliosis is common problem in children with cerebral palsy (CP). Scoliosis is not only associated with impaired posture, but also with pain, pressure ulcers, hip dislocation, cardiopulmonary dysfunction, and gastrointestinal dysfunction, and imposes limitations on participation in functional activities.
Purpose To evaluate the effects of lateral electrical surface stimulation (LESS) on scoliosis and trunk balance in children with severe CP
Methods Children with severe CP (GMFCS level IV or V) and stationary or progressive scoliosis were enrolled. LESS was performed at 40-80 mA intensity, 200 μs pulse width, 25 Hz frequency, on for 6 seconds and then off for 6 seconds on the convex side of the trunk curve. The children were recommended to receive 2 sessions of LESS/day, 1 hour/session, for 3 months at home. Trunk curvature and balance were evaluated using radiologic (Cobb's, kyphotic, and sacral angles) and functional [the sitting score of the Gross motor function measurement (GMFM)-88, and Trunk control measurement scale (TCMS)] measurements at 4 periods: (a) 3 months before, (b) just before, (c) 1 month after, and (d) 3 months after the treatment. After 3 months of treatment, LESS diaries, containing the stimulation duration and intensity, were collected and questionnaires were administered to the parents or main caregivers of the children.
Results Eleven children were enrolled (median age, 9 years). Their median Cobb's angle was 25°, and it showed significant improvements after both 1 and 3 months of LESS. The LESS intensity correlated with the improvement in the GMFM-88 siting score. The parents or main caregivers of the children believed that LESS had several positive effects, and no major adverse effects were reported.
Discussion and conclusions LESS improves scoliosis in children with severe CP and may improve trunk balance after LESS.

PP270
THE EFFECT OF BOTULINUM TOXIN A IN TREATEMENT OF HIP SUBLUXATION IN SPASTIC CEREBRAL PALSY

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Introduction: Progressive hip subluxation leading to hip dislocation is a common and serious problem in children with cerebral palsy. Reported rates of hip dislocation in children with cerebral palsy varied between 27% and 35%. The most common used measure for hip subluxation, for children with cerebral palsy, is the migration percentage. A hip is considered to be subluxated if the migration percentage is equal to or greater than 33%.
Purpose: The purpose of the study was to determine whether radiographic evidence of hip subluxation, measured by the migration percentage, changes after botulinum toxin A injections into spastic adductor muscles of children with cerebral palsy.
Methods: Conducting a retrospective clinical study, we followed 15 children (8 girls and 7 boys) with radiographic signs of hip subluxation (migration percentage greater then 33%). They were given a single injection of botulinum toxin A (Dysport 20 units/kg) 73.3% had a diagnosis of diplegic cerebral palsy and 26.7% had a diagnosis of tetraplegic cerebral palsy. Mean age was 3 years and 4 months (range between 2 years and 5 years and 5 months). Migration percentage before botulinum toxin A injection was in the interval from 33.3% to 76.5%.
Results: There were no adverse effects of the treatment. Improvement in hip migration percentage after botulinum toxin A injection was verified in 66.7% children. In this group 40% had migration percentage less then 33% while others had a migration percentage in the interval from 33.3% to 39.3%.
Discussion and conclusions: Botulinum toxin A is well-tolerated anti-spasticity treatment. Botulinum toxin A injections to adductor muscles may be beneficial for some children with cerebral palsy with radiograph verification of hip subluxation.

PP271
SINGLE UMBILICAL ARTERY SYNDROME: SHOULD I WEAR A "STRAITJACKET"? – A CASE REPORT

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Introduction: Single umbilical artery syndrome is a congenital disease characterized for the absence of one umbilical artery associated with several fetal abnormalities, including cardiovascular, gastrointestinal, renal and musculoskeletal defects.
Purpose: Describe a patient follow-up and adaptation to prosthetic/orthotic devices.
Methods: Girl with 11 years old followed in a Pediatric Rehabilitation Center, since 2 months years old, for congenital malformations: total agenesis of the left lower limb, iliac bone hypoplasia, malformation of the superior costal grid with rib synostosis, left abdominal rectus agenesis, renal and cardiac abnormalities. At 16 months, she received her first prosthesis for the left lower limb. At an early adapting stage, during the gait oscillatory phase the prosthesis presented abduction and internal rotation, with associated ipsilateral elevation of the pelvis. Up to the age of 7, the gait pattern steadily improved and she achieved independent in gait, ADL and placement/removal of the prosthesis, she had symmetric gait pattern, maintained mild abduction and mild elevation of the pelvis, and moved up and down stairs with the help of the handrail. In that period TLS orthosis was prescribed because of left toracic scoliosis onset. The use of this device has restricted ADL such as dressing, toilet use, bathing, reaching objects on the floor and placing/removing the prosthesis. Bilateral, axillary and abdominal pain was also described.
Results: Over the years the patient had a good prothesis adhesion and adaptation. The TLSO restricted the patient ADL. Since the progression of scoliosis was inevitable due to bone malformations, we decided to remove this orthosis.
Discussion and conclusions: The main goals of orthotic/prosthetic devices are to promote functional independence and participation. In this case report, the prosthesis fulfilled that claim, whereas the use of TLSO greatly limited the patient's activity in family and social context.

PP272
RUBINSTEIN-TAYBI SYNDROME: HOW CAN WE CONTRIBUTE FROM REHABILITATION?

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Introduction: Rubinstein-Taybi syndrome is a rare autosomal dominant, mainly characterized by facial dysmorphism, microcephaly, broad thumbs and toes, mental disability and postnatal growth retardation.
Purpose: Determine and standardize a protocol from the point of view of rehabilitation in this pathology.
Methods, results and discussion: Assessment and half-yearly / yearly followed from birth or time of diagnosis until the end of growth, by a multidisciplinary team coordinated by PMR in its field of action is necessary. Neuropsychological regular care is of great importance: behavioral changes, decreased attentional, hyperactivity, self-injurious behavior and tendency to autistic behavior. Assessment and treatment by the team of speech and phoniatrics therapy from birth or diagnose because of oropharyngeal dysphagia, difficulty chewing, speech disturbances and voice, overall language delay and difficulty in school learning. The musculo-skeletal and neurological system requires special attention: -Wide and deformed thumbs. Ask surgical repair before two years to improve functional skills in the hands. On foot only if it interferes with walking or footwear. -Fifth finger clinodactyly -Joint hipermobility and generalized hypotonia. -Great incidence of radial head dislocation (2% prevalence) and patellar: detailed analysis of gait pattern. Increased fracture risk -Detailed exploration of hips for increased incidence of congenital dislocation, Perthes disease, slipped capital femoral epiphysis and aseptic necrosis of the hip. -Spine supervision and chest cavity from neonatal period: recommended early study (MRI spine and skull) by association with axoid atlantoaxial instability, syringomyelia, odontoid hypoplasia, Chiari I malformation, spinal fusion, scoliosis, tethered cord, hydrocephalus, dysgenesis of the corpus callosum.
Conclusions: Pathology multidisciplinary approach, which requires coordination of different specialists, regular monitoring and treatment according to the different developmental stages of the disease

PP273
SCOLIOSIS IN A CHILD WITH PRADER - WILLY SYNDROME (PWS)

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Case Description: Report of case of a eight years old girl, with diagnosis of PWS, referenced to our Center due to a progressing scoliosis. She was treated with growth hormone (GH) at the age of six. Clinically she presented a 6mm at 3cm left lumbar hump in the Adams test and hipokyphosis. At X-Ray it was objected a structured 30º left lumbar curvature. The patient initiated the use of TLS Boston brace. After 6 months of treatment, there was a reduction of Cobb angle with the brace. The pacient maintains treatment with good compliance.

Discussion: PWS is a rare disease, with typical musculoskeletal changes and frequent appearance of scoliosis. The most common type of curve is thoracolumbar and lumbar, and about 40 % of scoliosis diagnosed after 4 years progress to values that require surgical intervention. This therapeutic approach is associated with high risk of complications. This is why it is increasingly advocated conservative approach of scoliosis in these patients. Some studies with small samples, suggest that the use of brace, may prevent the progression of scoliosis. The most recent studies seem to not relate the administration of GH in PWS with worsening or early onset of scoliosis. This case presents the changes most commonly described in scoliosis in PWS, where have been adopted conservative treatment with good results so far. The prognosis is related to the continued use of the brace, the comorbidities, among others.

Conclusions: Due to the frequency and potential severity of scoliosis in patients with PWS, an early diagnosis and intervention is critical. Although the best approach remains controversial, the high frequency of complications associated with surgery, make conservative treatment as increasingly frequent option. However, the decision will largely depend of the growth potential of the patient , the curvature characteristics and the clinical experience.

PP274
NON OPERATIVE CLUBFOOT TREATMENT, COMPARATIVE STUDY: FUNCTIONAL METHOD VERSUS PONSETI METHOD

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Introduction: surgical clubfoot treatment can occur several long-term complications. Clubfoot can be treated non operatively, using the Ponseti method or functional method
Purpose: compare the results of functional method and Ponseti method used to treat idiopathic clubfoot in our institution.
Methods: prospective comparative study (2008-2011); patients less than 3 months of age with idiopathic clubfoot were recruited and treated. We included 100 feet (65 infants): 52 feet in group 1 were treated according the functional method and 48 feet in group 2 were treated according to the Ponseti method. The use of surgery was a failure of conservative treatment Pretreatment severity was scored using Diméglio's classification. Last outcome: We evaluate results with modified Ghanem and Seringe score.
Results: A satisfactory initial correction (3months) was achieved in 97% of the Ponseti group and 69,2% of the functional group. At walk age: the assessment by the modified Ghanem and Seringe score don't find significant differences globally except for short and stocky and very severe feet where the Ponseti method gives better results. Five years follow up: modified Ghanem and Seringe score find excellent, good, fair and poor in respectively 23%, 35%, 19% and 23% of patients in group 1 and 23%, 33%, 25% and 19% of patients in group 2.
Discussion and conclusions:
- Our study confirms that good results can be reached by conservative treatment in clubfoot whatever the method.
- However Ponseti method gives better results for short and stocky feet.
- Poor results are due to relapses.

PP275
CONGENITAL LYMPHEDEMA IN UPPER LIMB

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Introduction Lymphedema is the chronic and progressive swelling of tissue caused by an inadequate lymphatic function. It results from an abnormal development (primary) or injury (secondary) of the lymphatics. The primary lymphedema appears in childhood and adulthood. Congenital lymphedema is the less common form of primary lymphedema (6 to 12 percent) and it is presented before one year of age.
Purpose The objective is to present a case report about an one year old boy who present congenital lymphedema.
Methods We present a case of an one and half year old child who was evaluated in our unit for the presence of edema in his left upper limb, since birth. In the clinical examination, we evidenced an important edema since elbow to fingers. The consistence was soft and it had pitting edema in the back of the hand. The Stemmer sign was positive. The range of motion was complete except for a limit in the end of the phalange flexion. In the limb circumference between both upper arms was evidenced a 2 cm difference in four levels. A doppler ultrasound showed a thickening and increased echogenicity of the subcutaneous fat tissue. A lymphography confirmed a left axillary node aplasia. The genetic testing was normal. The treatment was established with an individual rehabilitation program that consisted of teaching parents how to prevent and take care of lymphedema at home, multilayer low-stretch bandaging, manual lymph drainage, elastic glove and occupational therapy.
Results The limb circumference and volume were improved slightly and the hand mobility was complete.
Discussion and conclusions It is very uncommon the appearance of an upper limb lymphedema in congenital lymphedema, being more frequent his location in the lower limbs. The early diagnosis and rehabilitation treatment program can help to avoid disabilities and skin complications.

PP276
BOTULINUM TOXIN TYPE A IN THE TREATMENT OF SIALORRHEA IN CHILDREN: RETROSPECTIVE STUDY

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Introduction Sialorrhea is the excessive flow of saliva and it may be associated with various conditions. Unintentional loss of saliva is considered normal up to 18 months of age and consensually pathological after 4 years old. Anterior drooling can cause recurrent perioral infections, halitosis and dehydration; posterior drooling can cause cough, vomiting and aspiration pneumonia. The treatment of sialorrhea includes anticholinergic drugs, radiotherapy and, more recently, ultrasound guided botulinum toxin type A (BoNTA-ABO) salivary glands injection, considered to have a 3 to 6 months effect.
Purpose The aims of this study were to assess patients treated with BoNTA-ABO for sialorrhea in a pediatric outpatient consultation of a Physical and Rehabilitation Department and to evaluate their clinical and functional outcome.
Methods Retrospective and descriptive study engaging pediatric patients treated with BoNTA-ABO for sialorrhea between june 2012 and december 2014. Age, gender, main diagnosis and number of units and frequency of BoNTA-ABO administrations were collected for all patients. Drooling Frequency Scale was used to classify drooling in 5 degrees and it was applied before and after the treatment.
Results 10 patients (7 females and 3 males) with mean age 8.2 years were engaged in the study. 4 of them had cerebral palsy (CP), 1 suffered a traumatic brain injury, 1 had mosaic trisomy 18 and the others had infantile encephalopathies. BoNTA-ABO was injected an average of 3 times/patient in the salivary glands, with 6.1 months apart. There was a significant decrease in the Drooling Frequency Scale before and after the treatment (mean decrease 1.2 degrees). Sialorrhea improvement showed no correlation with the time between administrations nor with BoNTA-ABO dose.
Discussion and conclusions Despite the small size of our sample, these results support the efficacy of BoNTA-ABO ultrasound guided salivary glands injection in the improvement of sialorrhea, based on clinical findings.

PP277
IMPACT OF AEROBIC TRAINING ON MUSCLE STRENGHT, LEVEL OF FATIGUE AND QUALITY OF LIFE IN MULTIPLE SCLEROSIS PATIENTS

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Introduction: Multiple sclerosis (MS) is an autoimmune disease, which is accompanied by a number of severe symptoms including muscle weakness and fatigue, which gradually decreased quality of life. Clinical studies have shown that aerobic exercises have a positive impact on quality of life in neurodegenerative disorders.
Purpose: The purpose of this study was to evaluate the effect of aerobic training on quality of life, the prevalence of fatigue, muscle strength and motor disability in multiple sclerosis patients.
Methods: The research group comprised 21 MS patients. The rehabilitation program involved aerobic training of upper and lower limbs performed on the rotor and bicycle ergometer. The exercises were administered 2-3 a day for 15 minutes over four-week period. Three scales were used: The World Health Organization Quality of Life Scale (WHOQOL-BREF), Fatigue severity scale (FSS) and expanded disability status scale (EDSS). In addition, to measure the muscle strength, dynamometer Microfet 2 was used. Measurements were carried out before and after the four-week training program. The results were collected using the Statistica 6.0 software.
Results: In WHOQOL-BREF the changes were the most effective in physical and psychological parts ($p=0.001$). The results of Muscle strength in upper limbs were improved statistically significant ($p=0.001$) while lower limbs estimations showed lower level of improvement ($p=0.01$). Our study shows that aerobic training has also positive effect on decrease fatigue in FSS ($p=0.03$). However, there were no significant changes in the level of disability assessed by EDSS scale.
Discussion and conclusions: Aerobic training is very effective and cheap exercise therapy for MS patients. The positive effects of this exercise program are observed not only in the results of quality of life but also in improvement of muscle strength especially upper limbs and reduction of fatigue symptoms.

PP278
ASPECTS OF GENDER IN THE PRESENTATION OF THE ALZHEIMER DISEASE AND PARKINSON DISEASE IN PATIENTS SERVED IN PHYSICAL THERAPY SERVICES

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Introduction The Alzheimer Disease and Parkinson disease are events important but in this moment no exist elements that determine a relationship of the gender with occurrence of this pathologies
Purpose To know the aspects of gender in the presentation of Alzheimer Disease and Parkinson Disease in patients served in physical therapy services
Methods This is a study cross-sectional, the population of study was patients served in the Physical Therapy Services over 15 years old in the year 2012. Was calculated general and specific prevalence with standard error and Chi Square Test for the relation of the gender with presentation of Alzheimer Disease and Parkinson Disease Results In the year 2012 was served 1062 patients with neurological diseases in the Physical Therapy services, and between this persons the 19.67% (n=209, Standard Error=0.02) was cases of Alzheimer disease, and 77.51% of this patients was of female gender (n=162, Standard Error=0.01) (X2=49.76, p< de 0.05, O.R. =3.11, C.I. 95% 2.27 – 4.22). 6.12% of persons with neurological diseases was cases of Parkinson disease (n=65, Standard Error=0.02), 52.30% of this patients was of male gender (n=34, Standard Error=0.05) ((X2=0.99, p > 0.05, O.R.= 1.28, C.I. 95% 0.82 – 1.95)
Conclusions The Alzheimer disease and Parkinson disease are events with important prevalence between neurological diseases, and the presentation of the Alzheimer is more high in the female gender with positive elements for statistical association

PP279
FUNCTIONAL DYSPHAGIA SCALE FOR PREDICTING ASPIRATION PNEUMONIA IN PATIENTS WITH PARKINSONISM

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Introduction: Previous literature reported that high percentage of patients with Parkinsonism have a swallowing disability. However, it is challenging to verify the pathological mechanism of dysphagia through spatial and time variables. Only a little study discussed the relationship between these factors and aspiration pneumonia.
Purpose: The aim of this study was to describe the correlation between functional dysphagia parameters and aspiration pneumonia in patients with Parkinsonism.
Methods: Patients with Parkinsonism were prospectively evaluated in this study. Disease severity and functional status was measured by Schwab and England's Activities of the Daily Living (SE-ADL) scale and the modified Hoehn and Yahr (H&Y) staging. Cognitive function was measured by Korean version of Mini-mental state examination (K-MMSE). Swallowing function was evaluated in all enrolled subjects by Functional Dysphagia Scale (FDS) and Penetration-Aspiration Scale (PAS) based on videofluoroscopic swallowing study. They were followed up for 3 months and divided into 2 groups according to occurrence of aspiration pneumonia. The correlation between variables and aspiration pneumonia was analyzed.
Results: Fifty-five patients of Parkinsonism were enrolled in this study. Eight patients were allocated to the aspiration pneumonia group and 47 to the non-aspiration pneumonia group. The patients with aspiration pneumonia had significantly higher H&Y staging, lower SE-ADL scale and K-MMSE. They had significantly higher score of FDS and PAS. According to multiple logistic regression analysis SE-ADL scale and FDS were independently associated with occurrence of aspiration pneumonia in patients with Parkinsonism.
Discussion and conclusions: The FDS and SE-ADL scale could be a predictable variable for aspiration pneumonia in patients with Parkinsonism. Considering the FDS can quantitatively assess the functional problems of dysphagia, it is expected to have clinical effectiveness in predicting the occurrence of aspiration pneumonia in patients with Parkinsonism.

PP280
QUALITY OF LIFE IN PATIENTS WITH PARKINSON DISEASE: GENDER DIFFERENCES AND THE IMPACT OF PHYSIOTHERAPEUTIC INTERVENTION

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Introduction Parkinson's Disease (PD) is a chronic neurodegenerative disease, which commonly affects elderly, causing decrease in dopamine production. Later results in various motor and non-motor symptoms, which might have a negative effect on patient's quality of life (QoL). Women are known to report lower QoL. PD patient's QoL could possibly be improved with physiotherapy, by reducing the risk of secondary complications and teaching compensatory strategies to overcome motor difficulties.
Purpose To analyze possible gender differences in QoL before and after 2 month physiotherapeutic intervention in individuals with PD.
Methods 18 PD patients (9 women and 9 men; average age 80± 6,2 and average Hoehn & Yahr scale 2,3± 0,5) participated. QoL was assessed with Parkinson's Disease Questionnaire 39 (PDQ-39) before and after 2-month physiotherapy intervention (altogether 16 1-hour-sessions, twice a week in small groups).
Results The estimation of QoL and its different domains were lower in women with PD at baseline ($p<0.05$). After physiotherapeutic intervention the QoL of male participants was higher in the ADL domain ($p<0.01$) and in mobility, stigma and pain domains ($p<0.05$). After physiotherapy male patients reported physiotherapy to have a positive effect on almost every aspect of QoL except social support domain. PDQ-39 results of female patients showed little effect on their QoL. In some domains (stigma, cognition and communication) even a negative trend was notable.
Discussion and conclusions Men and women with similar clinical stage of PD report different QoL. Male patients seem to give more positive estimations on their QoL and seem to have been benefited more from physiotherapy in current study. Further studies are needed to verify our results.

PP281
REHABILITATION GAMING FOR BALANCE TRAINING IN PATIENTS WITH PARKINSON DISEASE

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Introduction: A variety of Web Based Home Rehabilitation Gaming System has been developed in the last years and recent studies shows that this games have a great impact in neurological rehabilitation of patients with movement and balance disorders. To increase the patients movement range , gain muscle strength, improve movement speed and coordination are the main objectives in patients with Parkinson disease .The games require visual perception, eye hand coordination, figure ground relationship so it represents a great tool in rehabilitation therapy. And further more for a disease in which about 45% of patients have depression, studies shows that Wii games brought most of the depression level down to zero.
Aim: We have studied 10 patients with Parkinson disease age between 50 and 55. They had daily training session for 3 weeks (15 sessions) for 30 minutes.The patients had to stay still on the Nintendo balance board for 20 min.This board has pressure sensors in each corner and information about center of pressure displacement in transmitted to the computer.The information about duration and time of gaming session and game score are stored in the system and the can be adjusted by the therapist ob by the patients himself. We have calculated velocity and area of center displacement pressure (Cop).
Results: Stabilometry data indicates reduction of both Cop and velocity in 8 cases. For the other 2 cases a small decline of stabilometry parameters was observed, but the Tinetti balance scale improved from 30 to 38 points.
Conclusions: It has been shown that utilization of therapy and gaming technology have a positive impact on patients with Parkinson Disease increasing balance and coordination. So probably the game system are the future of rehabilitation.

PP282
BLADDER DYSFUNCTION IN PARKINSON'S DISEASE – LITERATURE REVIEW OF THE PATHOPHYSIOLOGY, SYMPTOMS AND MANAGEMENT – IS THERE A ROLE FOR REHABILITATION TREATMENT?

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Introduction: Bladder dysfunction is a common non-motor disorder in Parkinson's disease (PD). It has associated significant morbidity and negative impact on quality of life (QoL).
Purpose: To review recent understanding on pathophysiology, prevalence, symptoms and diverse treatment strategies on vesical-sphincterian dysfunction (VSD) in PD.
Methods: A literature search was conducted using the keywords bladder dysfunction, urinary symptoms, Parkinson's disease, treatment and rehabilitation via PubMed, Index and ClinicalKey search engines.
Results: The prevalence of lower urinary tract symptoms in PD is high. Storage difficulties (nocturia and urgency) are the most common, due to overactive bladder. This seems to result from a change on the frontal-basal ganglia D1 dopaminergic circuit, which normally is responsible for micturition reflex suppression. The recent treatment guidelines for urologic dysautonomia lack randomized controlled trials, yet recommend dopaminergic and anticholinergic agents, with their well-known adverse effects. Other options exist to ameliorate VSD: bladder training, serotonergic drugs, deep brain stimulation, percutaneous posterior tibial nerve stimulation, transcranial magnetic stimulation and intramural bladder botulinum toxin injection.
Discussion: The literature regards VSD in PD as a major comorbidity. Quality of life can be improved with a multi-target approach, besides pharmacologic treatment. Recent studies on bladder training (pelvic floor muscle exercises assisted by EMG biofeedback and bladder control urge suppression strategies) have shown promising results has alternative strategies to urinary incontinence in PD, although higher clinical evidence is needed.
Conclusions: Most often, urinary incontinence is a neglected subjected in PD, although its negative impact on patient's QoL. Bladder training is promising alternative to pharmacologic therapy. This review presents the most recent studies and evidence on the pathophysiological mechanisms of PD bladder dysfunction and its available therapies.

PP283
PERIPHERAL FACIAL PARALYSIS: EFFECTS OF A REHABILITATION PROGRAM

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Introduction: Peripheral Facial Paralysis (PFP) results from affection of the seventh nerve and is the most common pathology of the cranial nerves pairs. Its incidence ranges from 20 to 30 cases per 100.000 people. The PFP can be primary or secondary to multiple causes (infections, trauma, inflammatory, metabolic or tumors), the first being the most common, constituting about 75% of the cases. The PFP is characterised by unilateral facial weakness, with other symptoms including loss of taste, hyperacusis, decreased salivation and tear secretion or speech disorders.
Purpose: this work consists of a case report presentation of PFP.
Case report: 68 year-old female patient is sent to Physical Medicine and Rehabilitation consultation for treatment of PFP secondary to acoustic neuroma removal surgery and was already submitted to various facial reanimation surgeries. In the first observation, the patient had pain complaints at right lower eyelid and malar regions, the patient couldn't perform some facial movements like smiling or wrinkling, had right hemihypoesthesia and anterior escape and accumulation of food in the right half of oral cavity. It was postponed rehabilitation program with physical therapy and speech therapy. Two months later, the patient presented a decrease of pain complaints, improvement of facial expression and anterior escape of food is more punctual.
Discussion and conclusions: For the best treatment of PFP, is necessary a multidisciplinary team, due to anatomical and physiological characteristics of this nerve. In turn, it is necessary to take into account the poor prognostic factors such as complete paralysis, age over 60, Ramsay-Hunt syndrome, secondary PFP and no recovery at three months. The use of treatment approaches tailored to the pretreatment classification and a better integration of the neuroscience of movement control may result in a more effective treatment.

PP284
TRAUMATIC BRACHIAL PLEXUS INJURY: A DEVASTATING INJURY AND A THERAPEUTIC CHALLENGE

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Introduction: the incidence of brachial plexus injuries (BPI) has increased over the last years due to the increasing number of motor-vehicle accidents, causing serious impact on the patient's life. Advances in surgical techniques have improved the results.
Purpose: revision of traumatic BPI demonstrating two clinical cases.
Methods: review of literature published between 2005-2015 conducted in Pubmed- MEDLINE and Scielo. Two clinical cases are described: Male, 52 years, right-handed. Suffered shoulder and right thoracic trauma in an accidental bicycle fall with projection which resulted in clavicle, scapula, thoracic vertebras fractures and BPI avulsion of C4, C5, C6/C7 and D1 roots. At observation had no active movements in the right upper limb (RUL), except in flexion of 2nd-5th fingers; absence of osteotendinous reflexes and sensibility in all RUL. The electromyography showed infraganglionar and supraganglionar injury of the BP. Male, 33 years, right-handed. Suffered accident with motorcycle with projection and trauma of right shoulder, with avulsion of C8 and D1 roots as stretch of C7 root. At 1stobservation showed: no active movements in flexion and extension of elbow, wrist and fingers; abolition of RUL reflexes, anesthesia in the anteromedial face of arm and lateral side of the forearm and hand. The electromyography showed denervation of the muscles examined (roots C5 - C8/D1). Both started treatment of Physical and Rehabilitation Medicine (PRM), were referred to Plastic Surgery waiting, to date, treatment plan from them.
Discussion and conclusions: Adult traumatic BPI represents 70% of the injuries secondary to motor vehicle accidents with 70% involving motorcycles or bicycles. PRM treatment includes pain control, preservation/ restoration of mobility deficits and muscle strength and prevention paralysis sequelae. Surgical treatment involves an individual approaching regarding the best functional results possible, being the timing between accident and the intervention critical for a better outcome.

PP285
DIABETIC LUMBOSACRAL RADICULOPLEXUS NEUROPATHY: A CASE REPORT

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Introduction: Diabetic Lumbosacral Radiculoplexus Neuropathy (DLRPN) is a relatively rare subtype of diabetic neuropathy. The pain of the lower limbs and paraparesis with proximal muscle atrophy are the cardinal symptoms.
Case description: A type 2 diabetes 71 year old male presented with a history of high intensity sudden inflammatory pain on the anterior region of the right thigh that started 3 months before consultation. Then he developed bilateral progressive pain and decrease of muscle strength on the proximal lower limbs. There was no history of trauma, no constitutional symptoms or sphincters incontinency.On physical examination he had a grade 3 (MRC) muscle strength on hip flexors, knee extensors and proximal lower limb atrophy.He had thermoalgic hypoesthesia on the anterior thighs and patellar and Achilles hyporeflexia. CT-scan of the lumbar spine ruled out medullar and radicular compression.The electromyography showed a sensitive-motor axonal bilateral lumbossacral plexopathy, with major involvement of the femoral nerves. The treatment is based in corticotherapy, analgesia and physical therapy aiming to improve functional mobility.
Discussion and conclusions: DLRPN typically affects older men (> 50 years) and classically starts with severe unilateral pain in hip or thigh which subsequently spreads to the other side within weeks to months. Days to weeks after pain onset, patients develop weakness typically in proximal leg muscles.The diagnoses of DLRPN is primarily based on the history and neurologic examination. The electrodiagnostic studies are useful in diagnosis and other diagnostic tests are useful to exclude pathologies with similar presentation. Pain control and physical therapy can assist in improving functional mobility.

PP286
TREATMENT AND REHABILITATION OF MILLER-FISHER SYNDROME - CASE REPORT

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Introduction: Miller-Fisher Syndrome (MFS) is an axonal polyneuropathy characterized by ophtalmoplegia, ataxia and areflexia/hyporeflexia in the absence of limb weakness and hypersomnolence. It is usually preceded by an infectious process.The diagnosis can be made clinically in the majority of the patients. Lumbar puncture with cerebrospinal fluid analysis and nerve conduction studies are often inconclusive in the early stages of the disease, and should not delay the diagnosis. Brain and spine imaging might be indicated to rule out other pathology. Anti-GQ1b antibodies are present in about 83% of patients with MFS. Initial treatment consists of supportive care and may require monitoring in an intensive care unit. Immunotherapy with plasmapheresis or intravenous immunoglobulin may be beneficial. After clinical stabilization, the patient should begin a rehabilitation program, without reaching fatigue.
Purpose: Evaluate the outcome of the intensive rehabilitation program instituted to a patient admitted for MFS.
Methods: Female, 67 years old. The patient reported gait difficulties with imbalance and diplopia. Ataxia, ophtalmoplegia and arreflexia were observed on the physical examination. There was no report of limb weakness or hypersomnolence.
Cerebral computed tomography and lumbar puncture without changes. Electrophysiological studies reported an axonal polyneuropathy, in acute phase, with severe gravity on the facial nerves. After intravenous immunoglobulin, support treatment and clinical stabilization, the patient initiated an intensive rehabilitation program.
Results: The outcome was favorable with normalization of the gait pattern and improvement of the ophtalmoplegia.
Discussion and conclusions: MFS is an axonal polyneuropathy, in which the diagnostic tests may be normal in the early stages. This should not delay the initiation of treatment.Management of complications on the acute phase and an adequate rehabilitation program is fundamental to a greater functional outcome.

PP287
GLUTEAL COMPARTMENT SYNDROME AFTER BARIATRIC SURGERY - CASE REPORT

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Introduction: bariatric surgery is increasingly used for the treatment of morbid obesity. It can present complications, such as nutritional disorders and neurological and respiratory complications. The gluteal compartment syndrome, although uncommon, can be very disabling and leave long-term sequelae, so it is important to highlight the importance of prevention and early diagnosis in these patients.
Purpose: to present the case report of a patient with gluteal compartment syndrome and describe its evolution under rehabilitation program.
Method: case report of J.S., male, 40 years, leucodermic, with a body max index of 55.7, who underwent gastric bypass surgery. There were no complications during the procedure. On postoperative day two the patient developed lower limbs and gluteal spontaneous pain associated with edema, appearance of gluteal pressure zones and feet paresis in the context of gluteal compartment syndrome. The situation evolved to secondary infection and extensive necrotizing gluteal myositis confirmed by abdominal and pelvic CT scan, with the need for extensive debridement and application of negative pressure bandages. The patient developed rhabdomyolysis and acute renal failure, with renal function improvement after vigorous IV hydration without dialysis. There was no significant improvement in neurological status, and subsequent EMG confirmed severe sciatic nerves bilateral axonal injury.
Results: during the rehabilitation program, the patients has shown progressive improvement of the overall muscle strength, having recently started to walk with the help of a walker and bilateral orthosis.
Discussion and conclusions: Patients undergoing bariatric surgery have increased risk of gluteal compartment syndrome, so it is imperative to invest in effective prevention and early diagnosis in order to minimize its incidence and severity. In severe cases, in which there is neurological and extensive muscle injury, rehabilitation plays a key role in the physical condition, autonomy and quality of life of this patients.

PP288
OSMOTIC DEMYELINATION SYNDROME

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Introduction: Osmotic Demyelination Syndrome is a condition characterized by acute demyelination of the pons and extrapontine structures, generally associated to flaccid tetraparesis and impaired speech and swallowing. Most cases are associated with electrolyte unbalances, particularly hyponatremia or its rapid correction. There are other predisposing factors, such as serious illness (Addison's disease, liver disease and cancer), nutritional deficit and alcoholism.
Purpose: to present a case report of a patient with osmotic demyelination syndrome, describing its evolution under rehabilitation program.
Methods: case report of S.S., female, 33 years, leucodermic, admitted for elective hemicolectomy for ascending colon tumor, locally advanced, with liver metastasis. During hospitalization, the patient was found to have hyponatremia, which etiology is currently under investigation, the main diagnostic hypotheses being Syndrome of Inappropriate Antidiuretic Hormone Secretion and Cerebral Salt Wasting Syndrome. After electrolytic correction was started, the patient developed flaccid tetraparesis. The brain MRI was consistent with extrapontine myelinolysis. She initiated a rehabilitation program in the Surgery ward and is about to be transferred to the Physical Medicine and Rehabilitation ward.
Results: during the rehabilitation program, there has been a slight improvement of the overall muscle strength, despite maintaining an important degree of dependence in activities of daily living (Barthel Index 25; FIM 66).
Discussion and conclusions: The Osmotic Demyelination Syndrome is an uncommon complication resulting, in most cases, from electrolytic unbalances. The diagnosis is based on the clinical presentation, associated with suggestive brain lesions on MRI. Given its reserved functional outcome,it is imperative to recognize patients at risk and to invest in effective prevention. Early integration into an intensive and varied rehabilitation program, including physical therapy,occupational therapy and assistive devices is needed. Other professionals, such as dietitians, psychologists and social workers, are essential to achieve good results, regarding the functional recovery of these patients.

PP289
THE ROLE OF PHYSICAL AND REHABILITATION MEDICINE IN AN EARLY RADIATION INDUCED LUMBOSACRAL PLEXOPATHY - A CASE REPORT AND A BRIEF LITERATURE REVIEW

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Introduction: Lumbosacral plexopathies can be seen in patients receiving pelvic irradiation but are uncommon with standard external radiation doses. Rehabilitation aims to maximize mobility and functional independence.
Purpose: The authors present a case of a 72 year-old woman, followed in a PRM consult due to a radiation induced lumbosacral plexopathy. She was diagnosed with endometrial adenocarcinoma and submitted to total hysterectomy with bilateral adnexectomy and pelvic and aortic lymphadenectomy. Subsequently underwent external pelvic and paraortic radiation therapy plus vaginal brachytherapy and systemic chemotherapy. Two months after the end of the radiation therapy she referred paresthesias in lower limbs interpreted as side effect of chemotherapy. One month later, she presented distal weakness in both lower limbs and was hospitalized in Oncology department. She was observed in the PRM consult presenting reduced muscular strength (hip flexors G4; knee extensors G3; ankle dorsiflexors and plantar flexors G0) and impairment of sensation in the lower extremities. Bowel and bladder function were normal. She realized a magnetic resonance imaging (MRI) of the pelvis and an electromyography (EMG) that confirmed the diagnosis of radiation induced lumbosacral plexopathy. She began a rehabilitation program with strengthening of lower extremity muscles, gait and use of assistive devices for ambulation training. After discharge, she was oriented to our consult.
Discussion: Lumbosacral plexopathy is a rare late side effect of radiation, but in this case appeared after a few months, which made necessary to exclude nervous system involvement by tumor. Gradual progression of radiation-induced lumbosacral plexopathy is the rule and patients may have significant disability. Pain control is another important part of treatment.
Conclusions: After a long rehabilitation period, she was able to walk again. A good physical examination to determine what neurologic and functional deficits are present is crucial in order to guide a rehabilitation plan.

PP290
SCAPULAR DYSKINESIS REHABILITATION AFTER IATROGENIC LESION TO THE SPINAL ACCESSORY NERVE: A CASE REPORT

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Introduction: Neck dissection surgery may cause spinal accessory nerve (SAN) lesion by direct trauma or traction. Damage to SAN results in palsy and dysfunction of the trapezius muscle with pain, muscle atrophy and scapular dyskinesia generating important limitation to the upper limb functionality.
Purpose: To report a case of mononeuropathy of SAN, to review the differential diagnosis of winged scapula and establish a rehabilitation program with home therapeutical exercise.
Methods: Physical and Rehabilitation Medicine appointment and data collection of the clinical process.
Results: 54 year-old man, heavy smoker, submitted to left partial glossectomy with cervical lymph node emptying due to invasive spinocellular carcinoma of the left side of the tongue. He was observed in Maxillofacial Surgery postoperative consultation at 2 and 4 months and complained of pain and difficulty in mobility of the left shoulder. In Physical and Rehabilitation Medicine consultation he referred limiting mobility of the left arm and was objectified winged scapula, upper and middle fibers of left trapezius atrophy, limited range of motion during abduction and scapular dyskinesia with top and lateral shift, muscle strength reduction during abduction and elevation of the shoulder without distal segments deficits and hypoesthesia and dysesthesia. EMG and MRI were requested and the patient began pharmacological therapy and daily rehabilitation program complemented with home strengthening exercise.
Discussion and conclusions: SAN injury severity depends on the extent of neck dissection. During surgery and when possible, it's advisable to preserve the nerve and prevent its traction. Early identification of SAN injury is very important allowing early intervention, avoiding sharp functional deficits for the patient and improving their prognosis. The introduction of early rehabilitation programs after neck surgery to all patients should be considered and we suggest a rehabilitation protocol with home therapeutical exercises.

PP291
IATROGENIC PERIPHERAL FACIAL PALSY – OUTCOME AFTER SURGICAL AND PHYSIOTHERAPY TREATMENT

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Introduction: Unilateral peripheral facial paralysis (PFP) is a common disease that is associated with significant functional and aesthetic deformity as well as psychological issues. Though idiopathic facial paralysis (Bell's palsy) is the most common diagnosis, patients can also present with a history of infectious disease, tumor, trauma or iatrogenic facial paralysis. Despite technological advances, iatrogenic facial nerve injury is one of the greatest fears during ear surgery. While early repair can be achieved by direct nerve repair, cross-face nerve grafting or regional nerve transfer, long lasting facial palsy is commonly associated with muscle atrophy, which implies more complex surgical approaches.
Purpose: To review the management and discuss the outcome of patients with iatrogenic facial palsy.
Methods: 68 years old patient, with iatrogenic right PFP secondary to acoustic neuroma excision on 19 January 2012. On 7 July 2015 she underwent a micro-neurovascular gracilis free flap transfer. She presented to Physical Medicine and Rehabilitation Department on 27 July 2015 and started a facial rehabilitation program based on neuromuscular reeducation. The patient was prospectively evaluated until November 2015.
Results: The patient presented to us at 27 July 2015 with right PFP Grade V House Brackmann (HB) scale. On follow-up 4 months later, PFP had improved to Grade III HB.
Discussion and conclusions: As commonly described in the literature, micro-vascular free flaps are the technique of choice for facial reanimation in cases of long-standing facial paralysis. This technique combined with facial neuromuscular reeducation provides adequate functional and aesthetic results.

PP292
MAXIMIZING INDEPENDENCE IN A 40 YEAR OLD FEMALE WITH MULTI-MINICORE DISEASE IN ACUTE INPATIENT REHABILITATION: A CASE REPORT

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Introduction: 40 year old female with past medical history significant for Marfan syndrome, multi-minicore disease, scoliosis, mitral valve repair and chronic obstructive pulmonary disease presented to acute care hospital with left leg edema and pain for two days. Work up revealed DVT and patient was placed on anticoagulation. Patient was noted to have significant weakness and subsequently transferred to acute inpatient rehabilitation for functional upgrading. Upon admission patients FIM (Functional independence measure) was 52 for motor and 34 for cognition for a total of 86. A comprehensive rehabilitation program was implemented for this patient including instructions for sub-maximal exercises. To insure sub-maximal exercising creatinine phosphokinase (CPK) was closely monitored and trended. Patient was noted to have gait instability along with inability to independently lateral rotate her neck.
Purpose: Evaluate acute inpatient rehabilitation methods in a patient with multi-minicore disease
Methods: Monitoring patients CPK as well as FIM score.
Results: FIM of 75 motor and 34 cognition for a total of 102 and a FIM gain of 23
Discussion: Multi-minicore disease is a rare autosomal recessive congenital myopathy. Patients are diagnosed with a muscle biopsy showing multiple cores. Genetic testing will reveal a mutation in the selenoopretein N (SEPN1) gene and ryanodine receptor (RYR1) gene. These patients suffer from early scoliosis, distal weakness, muscle wasting and respiratory impairment.
Conclusions: There is no standard care for rehabilitation in patients with multi-minicore disease. We suggest these patients undergo acute inpatient rehabilitation after acute care hospital stay. Also, we recommend a comprehensive rehabilitation program be initiated with therapies done at a sub-maximal level and close monitoring of CPK levels and trends. We wear able to see significant gains as this patient was discharged home.

PP293
PHYSICAL THERAPY AMONGST PATIENTS WITH POSTHERPETIC NERVUS MEDIANUS LESIONS

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Introduction Herpes virus is known as varichela zoster. First stage is acute one, followed by virus attacking the sensorial nerve system in a hidden state. After the acute state, pain may be repeated in the affected dermatomas, known as a postherpetic neuralgia. In 9-45 % post herpetic nervus medianus lesion occurs with herpes zoster patients. Pain is similar to electric shock, parrestesions, dizestezions and hyperestenzions. Pain is felt over a 12 months period as recorded in 50% of patients over 70 years. One month after beginning of illness, 9-14.3% of patients feel pains, three months later 8% of them, and after one year 3% have intensive pains.
Case report A 61 male was affected by herpes virus. Rash was present on the left scapula. Pain in left thumb and index finger was present also. Further, pain intensified and extended to the whole arm; patient reporting reduced mobility. Dermatologist and neurologist were consulted, EMNG was done (partial lesion of n. medianus in wrist was lower). Physical therapy recommended.
Objectivity Alodiny, oedema, hand lividity, hypoesthesia in thumb and index finger and impossibility of fist forming. Pain VAS 10. Palm extension, supination limited, internal shoulder rotation, painful. Hypotrophy of m. deltoideus. Diagnosis: Laesio n.mediani l.sin postherpetica, Sy Sudec. TENS, Laser and Electrostimulations to be applied for 3 months. Patient re-examined every 2 weeks. First control report: reduced pain (VAS 8), less oedema and improved arm extension, full supination, shoulder mobility was the same. Exercises introduced to for range of motion and strength of emasculatory structure. Neuropathic pain therapy introduced. Requested control EMNG not made. Final check: reduced complains, 70% reduced pain (VAS 3), no doedema, possibility of fist forming, normal colority of hand, supination and internal shoulder rotation.
Conclusions Complete, continuous and properly tuned therapy along with medications proved successful, i.e. reduced complains and improved arm functionality.

PP294
PATIENT WITH MULTIPLE RELAPSES OF PERIPHERAL POLYNEUROPATHY LEADING TO REHABILITATION PLAN MODIFICATION: A CASE REPORT

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Introduction: We present the case of a patient, with initial diagnosis of Guillain Barre syndrome, who presented with two relapses of polyneuropathy after her admission to our rehabilitation clinic, leading to a new diagnostic approach and modification of her rehabilitation program.
Case report: A 45 year old female patient, was admitted with initial diagnosis of Guillain Barre syndrome that had been treated with intravenous immunoglobulin (IVIG) in a neurology department following two episodes of gastroenteritis. The patient presented with muscle weakness of the lower extremities, sensory disorders of the upper and lower extremities and Bell's palsy. Two days after admission the patient had a relapse, including decrease of muscle strength in the lower extremities and proprioception disorders and was treated with IVIG, while the rehabilitation program was modified. After a month of moderate clinical improvement, the patient had a second relapse, therefore a new laboratory study was performed, which led to a new diagnosis of Chronic Inflammatory Demyelinating Polyneuropathy (CIDP) and a new therapeutic scheme was given (iv Cyclophosphamide monthly combined with corticosteroids pos daily), resulting to significant clinical and functional improvement.
Results: Early modification of the rehabilitation program combined with a new therapeutic approach, after revision of diagnosis, resulted in performance improvement in all activities of daily living for the patient as measured by the Modified Barthel Index , as well as clinical improvement measured by the Revised Nottingham Sensory Assessment regarding light touch and proprioception.
Conclusions: The possibility of misguided diagnosis should always be considered in cases of unexplained clinical aggravation. Therefore, there should be alertness for a possible revision of the rehabilitation plan in order to reduce the burden of illness and maximize the patient's functional outcome.

PP295
B VITAMINS IN THE TREATMENT OF COMPRESSIVE NEUROPATHIES

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Introduction: The effect of using combination of neurotropic B vitamins in the treatment of carpal tunnel syndrome (CTS) is reflected in: B12 relieves pain and stimulates the synthesis of myelin, B6 performs synthesis of amino acids and key neurotransmitter responsible for the transmission of nerve impulses in nerve fibers and B1 improves energy balance in the nerve fibers (stimulates the synthesis of ATP).
Purpose: The aim is to show and compare the effects of electrophoresis (EF) B group vitamins (ampoule B1, B6, B12) and the oral therapy of NSAIDs in the treatment of CTS.
Methods: 33 patients with a diagnosis of CTS, divided into two groups: G1- 18 patients, mean age 55.17; therapy EF with ampoule of B vitamins; and G2- 15 patients, mean age 53.67, therapy of NSAIDs. The groups were homogeneous by gender and age. Monitoring parameters were: VAS before/after treatment and Tinel-Hoffman sign (THs) before/after treatment. Therapy of both groups lasted for three weeks. Excluding factors were cervical radiculopathy (lesions roots C7 and C8), and proximal neuropathy median nerve in the elbow.
Results: VAS before therapy G1/G2 mean 8 (6-9)/8 (7-9), p= 0.324;VAS after therapy G1/G2 2 (3-6)/4 (2-6), p= 0.209;VAS before/after therapy: G1 8 (6-9)/2 (3-6), p< 0.001, G2 8 (7-9)/4 (2-6), p<0.001. THs before therapy G1/G2, p= 1; THs after therapy G1/G2, p= 0.015. G1:THs before/after therapy p=0.001, G2:THs before/after therapy p= 0.248.
Discussion and conclusions: There is no statistically significant difference between groups at the subjective feeling of pain. In both groups there was a statistically significant reduction in subjective experience of pain after treatment. There was a statistically significant reduction in positive Tinel-Hoffman's sign in patients after treatment with vitamins B group and statistically significant difference between groups in Tinel-Hoffman's sign after treatment (in favor of a negative test in G1).

PP296
THE ROLE OF PHYSICAL MEDICINE AND REHABILITATION IN THE FAMILIAL AMYLOIDOTIC POLYNEUROPATHY – CASE REPORT

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Introduction: Familial Amyloidotic Polyneuropathy (FAP) Type I is a neurodegenerative, autosomal dominant, systemic amyloidosis characterized by extracellular deposition of transthyretin. It is a life-threatening multisystem disorder and its natural history consists of a progressive sensitive, motor and autonomic neuropathy, first described by Andrade in Portugal. Polyneuropathy may be the earliest symptom of amyloidosis, and there is often a lag between symptom onset and the development of autonomic symptoms.
Purpose: To report the clinical case of a 69 year old patient with FAP.
Methods: We present a case of a sixty-nine year old male patient with previous history of FAP, diagnosed in 2013, followed by our PMR (Physical Medicine and Rehabilitation) department, presenting with blurry vision, dizziness and general malaise. He was admitted into the Endocrinology ward to study recurrent episodes of hypoglycemia.
Results: Hypoglycemia was not verified, instead, orthostatic hypotension, hyperhidrosis, sensorial and motor polyneuropathy were observed, confirming the presence of autonomic neuropathy. The patient's rehabilitation was coordinated by the PMR department. The rehabilitation program consisted of stretching and strength training, activities of daily living training, namely, dressing and personal hygiene, balance and coordination training, transfers (e.g. from chair to bed) and walking exercises. Support products such as compression stockings and an abdominal support belt were prescribed.
Discussion and conclusions: FAP type I treatment is based on liver transplantation, as a means to halt disease progression. PMR plays an important role in maximizing and prolonging independent and safe locomotion, inhibiting physical deformity, patient education and facilitating the patient´s integration into society. It seeks to improve the patient's overall function. In this case, compression stockings and an abdominal support belt were the key to addressing the patient's orthostatic hypotension. Further studies on FAP and the breadth of impact that PMR has on the recovery process are needed.

PP297
RECOVERING FROM AN OLD AND SEVERE IATROGENIC FACIAL PALSY: THE ROLE OF SURGERY AND REHAB PROGRAM

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Introduction: Facial nerve injury during middle ear surgery is a well known but still a very dreaded complication. The implication of facial paralysis is quite obvious and very dramatic. In many cases, it's available surgical procedures to restore nerve function, such as facial nerve decompression, primary end-to-end anastomosis, interpositional nerve grafts with the great auricular nerve and nerve substitution of facial-hypoglossal anastomosis. Rehabilitation strategies are essential for the final outcome.
Purpose: To present a clinical case of iatrogenic facial palsy, that shows that surgical procedure plus a comprehensive rehabilitation program can have good results even many years after the nerve injury.
Methods: 23 years old man, suffering severe facial palsy after middle ear surgery 8 years ago, underwent surgical procedure (facial-hypoglossal nerve anastomosis), followed by a multimodal rehab program including electrical stimulation, manual trophic massage, facial muscle training and injection of botulin toxin in contralateral hemiface to enhance symmetry.
Results: At initial evaluation patient presents a grade V lesion in House Brackmann scale. After only 3 months of rehab strategies he evolutes for a grade IV dysfunction, and after 6 months he recovers for a grade III lesion.
Discussion and conclusions: Even in an old and severe facial palsy, surgical repairment associated with a multimodal rehabilitation program can provide good functional and esthetical outcomes.

PP298
PERIPHERAL POLYNEUROPATHY ASSOCIATED WITH NON-HODGKIN TYPE B LYMPHOMA: A CASE REPORT

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Introduction: Lymphomas are a rare cause of peripheral neuropathy. Few studies have been conducted on the subject and it is not a straightforward diagnosis, which results in a frequently overlooked etiology when seeking the cause of peripheral neuropathies.
Purpose: The purpose of this abstract is reporting the case of a 50 year old woman, who, during the study of a progressive peripheral polyneuropathy, was diagnosed with a Non-Hodgkin type B lymphoma, which is assumed as the etiology of the symptoms. After the case report, including the evolution during two admissions to our institution, we present a brief review of literature on the subject.
Methods: Regarding the review, we searched Pubmed, Cochrane and Google Scholar databases with the terms "lymphoma" and "peripheral neuropathy" and/or "neurolymphomatosis". The articles accessible through the institution's library were consulted.
Results: Both inpatient stays in CMRA had important outcomes in global functionality measured by the Functional Independence Measure scale, albeit maintaining important limitations in both hands. From our research, we mainly found isolated case reports, or small series of cases, with various presentations of the neuropathy and, frequently, with the clinical symptoms of neuropathy leading to the diagnosis of lymphoma. The two main physiopathologies are neurolymphomatosis and paraneoplastic syndromes, and treatment of the lymphoma frequently does not result in satisfactory outcomes regarding the neuropathy
Discussion and conclusions: Peripheral neuropathy associated with lymphoma is not an easy diagnosis, not only for its rarity, but also for the difficulty in establishing a definite relation between the two. Treatment with chemo and radiotherapy only rarely seems to result in remission of the neuropathy, which reinforces the important role of rehabilitation in improving functionality.

PP299
THE EFFECTS OF EXERCISE ON GAIT AND FUNCTION IN PATIENTS WITH DIABETIC POLYNEUROPATHY

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Introduction. People with diabetic polyneuropathy have lower extremity impairments. An inability to walk a quarter mile and inability to walk up 10 steps without resting are the most frequently reported mobility limitations. Little evidence exists to determine whether these impairments in mobility can improve with exercise.
Purpose. The purpose of this study is to describe the effects of supervised exercise program for 8 weeks, on physical performance (Timed 10 Meter Walk Test and Function test).
Method. The study group consisted of 71 patients with an average age 60.81 (SD 8.78), duration of diabetes > 10 years, electromyography confirmed polyneuropathy. The patients participated in a moderate-intensity weight-bearing exercises program: balance exercises and strengthening exercises for the lower extremities using body weight resistance. The exercises included in this program were adapted from the Feet First intervention and from exercises used in prior interventions that reduced falls in patients with peripheral neuropathy. Function test (FT) consists of 8 questions for assessing daily activities: general activity, walking, climbing on and off the bed, walking up and down stairs, squat, home activities / three items /. Evaluating 0-6. High score indicates a limited functionality. Measurements were taken before (pre) and after (post) the 8 weeks of exercise.
Results. Average Self Selected Velocity pre exercise was 0.44 (SD 0.15) m/s, min - max 0.16 - 0.71 m/s; after training, the patients increased walking speed by 0.11 m/s, $Z=-6.515$, $p<0.001$. The FT score pre exercise was 17.14 (SD 5.58) min/max 8/32. After intervention the FT score was 14.15 (SD 3.94) min/max 8/25; $Z = -6.645$, $p<0,001$.
Discussion and conclusions. Specific training can improve gait speed and this study showed that participants in the program of the exercise achieved a increase in activity.

PP300
REHABILITATION IN PATIENT AFTER POSHERPETIC NEURALGIA

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Introduction: Postherpetic neuralgia is a chronic neuropathic pain sindrom resulting as cosequence of herpes zoster viral infection. Almost every fifth patient with herpes zoster manifestations develops persistent neuropathic pain. Virus could be under supprimation for years and after decreasing of immune system responce could be reactivated.
Objective: The benefit of physical therapy in achieving of fast recovery of the patient after postherpetic neuralgia.
Methods: Female patient 76 years old. Presented at the first physiatrist examination because of pain in right hand, aggravated mobility - previously examinated by neurologist and orthopedic surgeon. Discomfort has started before fiew months after acute attack of herpes zoster manifestation. Physical therapy was not conducted at the first month of sympthom persistance. Objective status at the first check was as follows: reduced active movements in right hand, abduction 60 degrees, internal and external rotation minimal painful. Hipotrophia muscles of the right arm. Weakness rough driving force right hand, semiformation of fist with eritomatozne changes Patient started with the physical therapy :electrotherapy (Tens current 85 Hz, Interferential current, sonotherapy-ultrasound, Magnetic Therapy MT 54 mT, f 25Hz 20 minutes and at the end kinesytherapy. Physical therapies carried out 15 therapeutic procedures. Controls were made every day.
Results: After carried physical therapy patient without pain and full active movements in right. Better rough driving force at right hand and the fist complitely formated.

PP301
QUADRILATERAL SPACE SYNDROME: A DIAGNOSTIC CHALLENGE

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Introduction: Quadrilateral space syndrome (QSS) is a rare upper limb neurovascular disease that arises from the compression of the axillary nerve and posterior circumflex humeral artery within the above mentioned space. Is underdiagnosed in clinical practice among patients with painful shoulder.
The **purpose** is to identify in which clinical context should the clinician suspect this diagnose and how to conduct further assessment for this syndrome. This article reviews the literature regarding the history and clinical presentation in patients diagnosed with QSS.
Method: This review paper gathers 51 cases from 15 articles regarding the history and clinical presentation in diagnosed patients with QSS. The search was developed in 2015. Signs and symptoms are determined by the pathological mechanism which can be evidenced through an adequate selection of investigations.
Results: QSS can be classified as neurogenic QSS or vascular QSS, based on clinical presentation and underlying cause. Most patients perform sports that involve repetitive intense movements of the shoulders. There is a wide range of elicited symptoms due to various causes: numbness, weakness, pain versus pallor and ischemia manifestations. Highlights on remarkable case reports are reported as well.
Discussions and Conclusions: QSS includes a wide range of manifestations, due to the muscles that form its boundaries and anatomic variability. However, it should be taken into consideration, especially in "overhead athletes".

PP302
ULTRASOUND-GUIDED BLOCKADE OF THE ULNAR NERVE IN GUYON'S CANAL: TECHNIQUE DESCRIPTION AND CASE REPORT

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Introduction: The ulnar neuropathy at the wrist is less common than at elbow. The symptoms are hand weakness, hypothenar atrophy and hyperalgesia in ulnar territory. The diagnosis is clinical but sometimes is possible to confirm it by electromyography. The conservative treatment include night wrist-hand orthosis, oral drugs and local infiltration with corticosteroid and local anesthetic.
Purpose: The objetive is to present the technique description of the cubital nerve blockade in Guyon's canal with ultrasound-guide and to present a case report.
Methods: A 46 year old woman that 2 months before suffered a burning pain in her left wrist, located in the distal ulnar area and 5th finger. We noticed an amyotrophy of the hypotenar area and of the fourth dorsal interosseous muscle, and a hyperalgesia in pin prick and light touch in cubital nerve area. The Visual Analogue Scale (VAS) was 10/10. In the electromyography we observed initial signs of denervation over left cubital nerve. We decided to do a cubital nerve blockade.
Technique description: We used a linear transducer at frequency of 10 MHz. We put the transducer in the transverse axis of the wrist, in the palmar area. We can find the cubital nerve into the Guyon's canal, between the pisiform and the ulnar artery. Once identified the nerve, we perform the blockade with 1 ml of triamcinolone and 2 ml of mepivacaine.
Results: Two weeks after, the patient reported an improvement of the pain, being the VAS score 7/10 , so a new nerve blockade was performed. Two weeks after the patient reported a VAS score of 2/10.
Discussion and conclusions: The results are similar to those found in the literature. The ulnar nerve blockade is an effective and easy treatment in patients with ulnar neuropathy at the wrist.

PP303
MYASTHENIA GRAVIS – VOCAL CORD PALSY AS AN UNCOMMON PRESENTATION

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Introduction: Myasthenia gravis is a neuromuscular transmission disorder, caused by antibodies towards neuromuscular junction acetylcholine-receptors. It has an annual incidence between 0.25-2/100000 and an estimated prevalence up to 40/100000. The hallmark of Myasthenia Gravis is a fluctuating degree and variable combination of weakness in ocular, bulbar, limb and respiratory muscles. Bilateral vocal cord palsy is much less common, and is a potentially life-threatening condition, rarely implicated in this disease.
Clinical description: We report the case of a 71-year-old male without prior history of myasthenia gravis, who recurred to ER in July 2015, with a 2 week history of progressive dysarthria, dysphagia and facial paralysis. As suspected to have Myasthenia Gravis, he started therapy with intravenous immunoglobulin. Days after starting medication, he developed acute respiratory distress that led to an endotracheal intubation. While responding to the immunoglobulin, he showed regression of symptoms and was extubated ten days later, starting swallowing reeducation. He had an uneventful recovery until discharge at the end of August, keeping ambulatory physiotherapy. In September, he made the second cycle of immunoglobulin without problems. Few days before the third cycle in October, he started a progressive stridor crisis and, after unsuccessful intubation, a tracheostomy was made. When stabilized, the patient resumed physiotherapy, speech therapy and started invasive ventilatory weaning. He recovered during hospitalization, being discharged home in November, after the immunoglobulin fourth cycle. Nowadays he's still in speech therapy and physiotherapy, being followed by PRM and Neurology.
Discussion and conclusions: For being an uncommon presentation and potentially life-threatening condition, clinicians must be alert for this different presentation. PRM has an important role in preventing complications and improving quality of life in patients affected by this condition, mostly by speech therapy and physical therapy, in order to optimize respiratory function.

PP304
HETEROTOPIC OSSIFICATION IN GUILLAIN-BARRE SYNDROME, A RARE SITUATION

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Introduction: Heterotopic ossifications are orthopedic complications, observed after central neurological diseases, including spinal cord injury and traumatic brain injury. Some cases have been described in the Guillain-Barré syndrome.
Observation: We present the case of a 22 year-old woman with no particular history. During her first pregnancy she presented gestational diabetes and pregnancy-induced hypertension. By the 20th week of pregnancy and during her hospitalization for an abortion she presented a coma which justified his transfer to an intensive care unit, where she stayed for 23 days. The diagnosis of Guillain-Barré syndrome has been selected for clinical and paraclinical arguments. Twenty-four months later, the patient was brought to the PMR service of the University Health Centre (CHU) of Oran. The medical examination found peripheral sequela (after_effects) of tetraparesis associated with significant stiffness of the two lower limbs in connection with heterotopic ossification. This made the function of walking almost impossible.
Discussion: Heterotopic ossifications are rarely found in peripheral neuropathic damage. Their occurrences are an aggravating factor of disabilities and impair the function of walking.

PP305
CLINICAL CHARACTERISTICS AFFECTING ACTIVITY AND PARTICIPATION AFTER TRAUMATIC HAND INJURY

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Introduction: Traumatic hand injuries can result in activity limitation and restriction in participation even after intensive hand rehabilitation programs.
Purpose: To evaluate activity and participation levels of individuals during the first year of their rehabilitation program after traumatic hand injury and define the clinical characteristics affecting activity and participation levels.
Methods: Fifty participants (36 male) between ages of 18-65 years were enrolled. All had a history of traumatic hand injury and received hand rehabilitation program from the same physiotherapist within the first year after injury. Sociodemographic and clinical characteristics were documented. Pain intensity of the hand at rest and activity was evaluated by "Visual Analogue Scale" (VAS), hand dexterity by "Jebsen Hand Function Test" (JHFT), activity and participation by "Duruöz Hand Index" (DHI) and "Disabilities of the Arm, Shoulder, Hand" (DASH).
Results: Mean±SD of age was 33.9±9.9 years. Thirty percent of the population was heavy industrial worker, 50% had dominant hand injury, mostly with fracture and tendon rupture. JHFT, DHI and DASH scores of dominant hand injuries were significantly lower than the non-dominant hand injuries ($p<0.05$). No significant difference was found between the hands with single or multiple finger injury in terms of JHFT, DHI and DASH scores ($p>0.05$). Significant positive correlation was found between activity pain level and JHFT skills of turning five pages, taking six small objects off the table, putting them into cups, piling four cubes, DHI and DASH scores ($p<0.05$). Significant positive correlation was found between DASH score and resting pain level ($p<0.05$), as well as the number of days spend in the rehabilitation ward ($p<0.05$).
Discussion and conclusions: Pain that lasts during the first year after rehabilitation, non-dominant hand injury and the necessity for longer rehabilitation duration increases restriction in activity and participation after traumatic hand injury.

PP306
INTERDISCIPLINARY PAIN REHABILITATION PROGRAM FOR PATIENTS WITH CHRONIC WIDESPREAD PAIN

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Introduction: at our institution we implemented an interdisciplinary rehabilitation program for patients with chronic widespread pain during the year 2013. The group based program (126 hours in total) consists of patients' education about chronic pain, cognitive behavioral therapy, physiotherapy, occupational therapy and individual counseling by social worker.
Purpose: to evaluate the program after one year of implementation.
Methods: 44 subjects were included in the study, 40 female and 4 men, 30 to 59 years old (mean 47 years, SD 6,7). Indication for inclusion into the program was a shared decision by the screening team. Exclusion criteria were primary psychiatric health problem, personality disorders and other behavioral issues not permitting group based treatment, any sort of addiction, not speaking Slovene language or lack of motivation. Outcome measures: Brief Pain Inventory, SF36, and Pain Catastrophising Scale.
Results: 2 month after completion of the program we observed statistically significant improvement in pain intensity ($p<0,001$), pain interference, measured by Brief Pain Inventory ($p<0,001$), pain catastrophising ($p<0,001$) and all dimensions of SF36, except general health($p=0,159$), emotional functioning ($p=0,063$) and physical functioning ($p=0,066$).
Discussion and conclusions: 2 month after completing the program patients with chronic widespread pain demonstrated meaningful changes, measured by subjective outcome measures. If changes lasting two months represent a stable long-term improvement, remains to be evaluated in future studies.

PP307
THE BENEFITS OF MYOFASCIAL THERAPY IN THE REHABILITATION PROGRAM OF PATIENTS WITH ACL RECONSTRUCTION

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Introduction: Myofascial release therapy focuses on releasing muscular shortness and tightness. There are a number of conditions and symptoms that myofascial release therapy addresses; after losing flexibility or function following an injury or if experiencing ongoing knee, shoulder pain in any area containing soft tissue.
Purpouse: Althrough myofascial release is used for many years in rehabilitation, in our clinic we only begun to use this technique for a short period of time. We have choose in our study to analyse ACL reconstruction,because is very frequent pathology among active people who require quick professional reinsertion. We wanted to determine whether we can shorten the rehabilitation period.
Methods: We selected a number of 30 patients, aged between 24 and 50 years old with ACL reconstruction at 4 weeks after surgery. After clinical and functional assessment, informed consent, we divided the patients in 2 groups; one received only kinethotherapy (15 patients) and the second group received myofascial release and kinethoterapy (15 patients). The treatment was conducted for 8 weeks, with kinetotherapy 1 session daily and myofascial release 1 session at 3 days. We assess the patients by measuring knee flexion angle and pain(VAS) at the beginning of the treatment ,and at the end of every week.
Results: After completion of treatment we observed; -the first group had an improvement in VAS scale of 3,8 and the second group of 4,7 -the second group had an improvement in the flexion of the knee with 50 degrees -no side effects were observed and all patients completed the program
Discussions and conclusions: -the improvement of pain and ROM in the second group of patients supports the use of myofascial therapy in this group of patients - myofascial therapy proves its usefulness in shortening rehabilitation period of certain categories of patients -it is a method of treatment within reach of physiotherapists and well tolerated by patients

PP308
SHOULDER OSTEOARTHRITIS AND VISCOSUPPLEMENTATION: IS THERE ANY BENEFIT FROM ITS USE?

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Introduction: Glenohumeral arthritis is a painful and debilitating pathology, usually progressing with a decrease in patient´s ability to perform daily living. With increasing life expectancy and growing popularity of fitness activities, it is expected an incidence increase. Despite increasing incidence, treatment options remain limited, a helpful resource is often the use of anti-inflammatory drugs and oral analgesics, corticosteroid injections, physical therapy and activity modification, not always successful in relieving symptoms. Based on reviews of its use in knee osteoarthritis, intra-articular application of hyaluronic acid has grown in popularity.
Purpose: Authors claim to determine whether its use is effective in reducing pain and in functional improvement in shoulder osteoarthritis patients.
Methods: A literature review of English written articles was performed using Medline database, with the following outcomes: pain, functionality and safety. The key words used were the following: "glenohumeral", "osteoarthritis", "viscosupplementation", "injection", "hyaluronic acid".
Results: Of the identified articles meeting criteria for referral, the authors had full access only to four items: two prospective studies, one cohort study and a randomized clinical trial. Brander's prospective observational study (2010) found an improvement regarding pain and function, after use of two hyaluronic acid injections, results confirmed also in Silverstein's prospective study(2007). In the cohort study by Merolla (2011), when comparing injections with hyaluronic acid and methylprednisolone, there was a significant improvement in all follow up periods in patients treated with hyaluronic acid. Concerning the randomized clinical trial performed by Kwon (2013), an improvement in both outcomes in the group treated with hyaluronic acid was presented, however, no statistically significant difference from the group treated with "phosphate-buffered saline."
Discussion and conclusions: Intra-articular injections of hyaluronic acid in the treatment of shoulder arthritis present promising results, however, further study is required with high level of evidence for their effectiveness and sustained use.

PP309
EFFECTIVENESS OF HIGH INTENSITY RADIAL SHOCK WAVE THERAPY IN THE TREATMENT OF CHRONIC PLANTAR FASCIITIS

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Introduction Literature is scarce concerning the effectiveness of high dose radial extracorporeal shock wave therapy (ESWT). Therefore, the aim of this study was to investigate its effectiveness on pain, function and pressure pain threshold in patients with chronic plantar fasciitis (PF).
Materials and methods Patients with a diagnosis of chronic (pain lasting for more than 3 months) uni- or bilateral PF with a history of failed conservative treatment were included. After a 6-week control period during which no treatment occurred, a 2-week treatment period followed by a three weeks of rest (cicatrization phase) was provided. The treatment period consisted of three radial ESWT sessions (2000 impulses of 10 Hz frequency per session with an energy flux density of 0,275mJ/mm2) separated by a one-week interval. Patient assessments (pain intensity, foot function and pressure pain threshold (PPT) at the site of maximum local tenderness disability) were conducted at baseline, after the 6-week control phase (pre-treatment) and at the end of the cicatrization phase (post-treatment).
Results Thirty patients (19 women - 63.3%) with chronic PF and a mean age of 51.9±11 years were included in the present study. No drop-out occurred throughout the study period. No changes were observed at the pre-treatment assessment session except for pain intensity which decreased slightly but significantly ($P<0.05$). At the post-treatment session, highly significant ($P<0.001$) and clinically meaningful changes occurred for pain intensity (-34%), foot function score (-60%) and PPT (+68%).
Conclusions The present study suggests that high dose radial ESWT is a feasible and effective way to quickly and significantly decrease pain and disability in most patients with chronic PF.

PP310
PELVIC GIRDLE PAIN, A CASE REPORT AND LITERATURE REVIEW

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Introduction: Pregnancy has a profound effect on the human body, particularly the musculoskeletal system. Pain in the lower-back, pelvis (PGP), or both, is a common complaint and often gets worse as pregnancy progresses. The symptoms may begin during the 1st-trimester of pregnancy, at labour or during the postpartum period. Musculoskeletal pain in the pelvic area is common and cause substantial distress and disruption of function. Early education, advice, and exercise prescribed by a specialist in physical and rehabilitation medicine, attempts to reduce PGP in pregnant women. The clinical implications of PGP required a multidisciplinary interaction of a wide number of health-related specialties, including obstetrics and physiotherapy.
Purpose and methods: Case report and literature review. Databases of Cochrane Library and Pubmed were search from 2005-2015.
Case report: A 28-year-old woman, at 20 weeks-gestation, presented with intermittent sacro-iliac and low back pain, precipitated by prolonged sustained postures. She reported difficulty to walk and doing common daily activities such as sitting, turning over in bed, going upstairs and getting out of a car. The patient underwent an outpatient rehabilitation program and became symptom-free following 8-weeks of treatment.
Conclusions: Although the natural musculoskeletal changes accompanying pregnancy vary from woman to woman, PGP will be a problem for some patients. It is important for the physician to be aware of these effects in order to recognize symptoms because some conditions can have lasting, debilitating consequences. Moderate-quality evidence suggested that hidrocinesiotherapy reduce PGP in pregnancy. Specially shaped pillows help reduce PGP in late pregnancy and improve sleep. Low-quality evidence suggested that adding a rigid belt to exercise improves average pain but not the function. Physiotherapy and acupuncture may reduce PGP. Fortunately in this case the outpatient rehabilitation program with combined modalities of physiotherapy had good results and pregnancy progressed well without pain.

PP311
HIP PAIN DEVELOPED IN INTENSIVE CARE SETTING: CASE REPORT

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Introduction: Heterotopic ossification is the formation of mature lamellar bone in periarticular soft tissue and may occur after musculoskeletal trauma, neurogenic injury and can follow paralysis from diverse traumatic and nontraumatic neurologic insults. Idiopathic heterotopic ossification, without predisposing conditions, has been rarely reported in the intensive care setting.
Purpose: Case report and pertinent literature review.
Methods: A 54-year-old smoker male with lobar pneumonia was admitted to the intensive care unit (ICU) in the context of progressive respiratory insufficiency. Antibiotic treatment was initiated as appropriate, but due to a clinical syndrome consistent with adult respiratory distress syndrome (ARDS), mechanical ventilation support and curarisation were required. His stay at the ICU was extended due to septic events.
Results: Although having maintained physiotherapy focused on early mobilization and kinesiotherapy, he developed a severe impairment of both hips, characterized by joint stiffness, decreased range of motion and pain. He also developed critical illness polyneuropathy confirmed by electromyogram. Radiographs showed zones of heterotopic ossification of the periarticular regions at hip joint and CT scan confirmed important bilateral calcifications in gluteus medius and obturador internus muscles. After discharge he maintained physiotherapy and hydrotherapy in order to optimize his functional outcome considering the limitations imposed by the heterotopic ossification.
Discussion and conclusions: The pathophysiology of heterotopic ossification still remains unknown, but a systemic factor is likely to be an important part of this clinical situation, as suggested in literature. This patient may have some triggers such as hypoxaemia, sepsis, prolonged immobilization and curarisation. This case report emphasizes the importance of an early rehabilitation program in the intensive care setting and the role of the physiatrist in the differential diagnosis of hip pain and functional outcome of patients with heterotopic ossification.

PP312
COGNITIVE-BEHAVIORAL THERAPY (CBT) IMPROVES PHYSICAL AND MENTAL CONDITION TO WOMEN WITH FIBROMYALGIA (FM)

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Introduction: Cognitive-behavioral therapy (CBT) is the most efficient form of psychological intervention for the treatment of anxiety, depression, chronic pain, and Fibromyalgia with its associated symptoms.
Purpose: The objective of our clinical study was to evaluate the effects of CBT in several FM outcome domains. The purpose of the sessions is for the subjects to learn and apply coping strategies to improve each aspect of their life.
Methods: We included 48 women diagnosed with FM. They attended 12 sessions (one session a week, 2 hours for each session). The session is briefly described as it follows: managing pain, restructuring occupational performance and gradual activity, memory, attention and concentration as subjective complaints, conserving energy, learning the stress profile, personal control, learning techniques of physiologic and cognitive control. We evaluate the patients before the interventional program (T1), after they completed the 12 sessions of CBT (T2) and after a 4 months waiting period (T3).
We used for evaluation SF-12, a multipurpose 12-question Short-Form Survey, all selected from the SF-36 Health Survey. The questions were combined, scored and weighed to create two scales that provide glimpses into mental, physical function and overall health-rated quality of life.
Results: The group displayed a highly significant increase in the scores for both Physical and Mental condition scale between T1 and T2 evaluations (p=0.014), also observed between T1 and T3 evaluations (p=0.002).
Discussion and conclusions: Cognitive-behavioral therapy has an important contribution mostly in the emotional area, but it also has benefits on most of the other symptoms and quality of life. The reality that most of the improvements were still significant four months after the conclusion of the intervention is an indicator that the patients had properly acquired an important part of the techniques they were supposed to learn and included them in their own life style.

PP313
RISK OF DEVELOPING ADHESIVE CAPSULITIS IN PATIENTS WITH DIABETES: A SYSTEMIC REVIEW AND META-ANALYSIS

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Introduction: Diabetes mellitus (DM) is an important risk for musculoskeletal conditions. However, the association with adhesive capsulitis (AC) is not clear.
Purpose: The aim of this meta-analysis is to clarify the association between AC and DM.
Methods: A systemic search was conducted with MEDLINE, EMBASE, CENTRAL databases through June 30, 2015 with a double extraction technique to obtain relevant studies. Methologic quality of all papers was evaluated and a random-effects meta-analysis performed. The outcome was presented as a summary odds ratio (OR with 95 % confidence interval (95% CI). Heterogeneity of the meta-analysis was assessed.
Results: Of 2436 titles initially identified, 12 studies were eligible and a total of 345136 participants were included. There were 8 cross-sectional studies, 2 cohort studies, and 5 case-control studies.. The pooled odds ratio of 8 cross sectional studies that reported unadjusted estimates for the risk of AC in diabetics was 5.34 (95% CI 3.61-7.89). The pooled odds ratio of 2 population-based cohort studies was 1.98 (95% CI 0.87-4.82) but with significant heterogeneity ($\div^2$=0.41, I2 =99%, P<0.00001). The pooled odds ratio of 5 case-control studies which investigated the risk of DM in patients with adhesive capsulitis was 3.23 (95% CI 2.24-4.64). Subgroup analyses according to type of DM and revealed similar results. Sensitivity analyses also confirmed these results. Publication bias was not indicated.
Discussion and conclusions: This meta-analysis suggests that the risk of adhesive capsulitis increases in diabetic patients.

PP314
ULTRASOUND GUIDED EXTRACORPOREAL SHOCK WAVE THERAPY FOR CALCIFYING TENDINOPATHY OF THE SHOULDER – CASE REPORT

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Introduction – Calcifying tendinopathy of the shoulder is a common disorder that is characterized by calcifications in the rotator cuff tendons. It is often a chronic condition where the natural repairing ability of the tendon is hindered, associated to an overuse of the arm. The first line treatment should be conservative, including rest, physical therapy and non-steroid anti-inflammatory drugs. Extracorporeal shock wave therapy (ECSWT) if one of the possible second line treatments with good medium-term results and is becoming increasingly popular in our practice as an alternative to surgery.
Purpose – To report a case where a patient with calcifying tendinopathy of the shoulder, with poor results after physical therapy, was subjected to 3 sessions (separated by 2 weeks) of ECSWT with ultrasound guidance, and measured the outcome as described below.
Methods – Three sessions of ECSWT (separated by 2 weeks) were performed. Location and depth of the calcifications were mapped using ultrasound, and the generator parameters and area of application was adjusted accordingly. The generator was electrohydraulic with 180 ppm and were applied 1200 pulses each session. Results were measured before each session and one month after the last session. We used ASES* and UCLA** scores, shoulder range of motion, VAS (Visual Analogic Pain Scale).
Results – The patient showed significant improvement after the 3 sessions in range of motion, VAS and in both the ASES and UCLA scales, and smaller further improvement after 1 month.
Discussion and conclusions – ECSWT appears to be a technique with positive results for calcifying tendinopathy of the shoulder, regarding the control of pain, increased range of motion and improved function. However it is necessary further follow-up to assess the long term effectiveness of this approach.

* American Shoulder and Elbow Surgeons Standardized Shoulder Assessment Form
** University of California at Los Angeles

PP315
EXUBERANT SOFT TISSUE CALCIFICATIONS OF PLANTAR FASCIA: A CASE REPORT

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Introduction: Plantar fasciitis is among the most common foot disorders. A variety of treatment modalities have been described in literature for plantar fasciitis, including rest, massage, pharmacotherapy and physical therapy such as extracorporeal shockwave therapy (ESWT). Multiple studies showed effectiveness of corticosteroid injections (CI) in plantar fasciitis, reducing the heel pain and plantar fascia thickness.
Purpose: The authors present the case of a 54 years old woman referred to the Physical Medicine and Rehabilitation department for plantar fasciitis, with 15 years of evolution, resistant to conservative and medical treatments.
Methods: A multidisciplinary team reviewed the clinical history, image studies and performed a clinical evaluation and follow-up.
Results: The patient recalled multiple CI in the past with betamethasone and methylprednisolone acetate suspensions, with brief relief of symptoms. In the last two years she is complaining of increasing heel pain while walking and with prolonged weight bearing. An X-ray of her right foot revealed an area of calcification near the plantar fascia insertion. A computed- tomography to clarify the lesion showed an exuberant conglomerate of calcifications in the medial aspect of plantar fat pad associated with subcutaneous oedema suggesting steatonecrosis. After modest results with physical therapy treatment including ESWT therapy, she became a candidate to surgical procedure.
Discussion and conclusions: There are very few case-reports about plantar calcification following CI. They are a rare but feared complication, generally associated with multiple injections. Incorrect injection of corticosteroids can also induce necrosis and atrophy of the plantar fat pad, associated with increased morbility. Although CI in plantar fasciitis is generally associated with low serious complications, in this clinical case the repetitive procedure and the slightly soluble, long acting corticosteroid used (betamethasone), could be implicated as a causal effect in the formation of these exuberant calcifications.

PP316
HOW TO SOLVE AN EPICONDYLITIS? (ALMOST?) EVERYTHING IN A CLINICAL CASE

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Introduction: Epicondylitis is a common, painful condition affecting the common extensor tendon at the elbow. The pathophysiologic process is a tendinosis, that can occur by microtrauma or repetitive stress. It is present in 1% to 3% of the general population, occurring predominantly in the fourth and fifth decades, with no predilection to gender. Different rehabilitation techniques and treatments are being used and can include: rest, physiotherapy, platelet-rich plasma injection, botulinum toxin injection or ultrasound-guided percutaneous needle tenotomy. Surgery treatment is recommended when functional impotence and pain persist.
Clinical description: Male patient, with a history of nephrolithiasis and Morton neuroma that, in October 2014, started right elbow pain complaints (QPS = variable), diagnosed as lateral epicondylitis at PMR appointment, which led him to start a physical therapy program. Since there was lack of improvement of complaints, he conducted ultrasound (showing slight thickening and heterogeneity of the extensor common tendon, at the epicondyle enthesis, consistent with tendinosis) and completed 5 sessions of mesotherapy. He continued complaints of moderate pain in QPS, motivating performance of elbow IRM, that highlighted aspects compatible with epicondylitis. He was proposed to PRP injection, after epicondylian eccentric strengthening, with transient improvement of complaints. As he kept repetitive episodes of intense pain relapse, with Mayo Elbow Score <60, he underwent echoguided fenestration, of the right lateral epycondylian enthesis, associated with BoNT/A chemodenervation. Until now, he has completed two sessions of fenestration, ranking a score of 85 at the Mayo Elbow Score.
Conclusions: There are several therapies for treating epicondylitis, but most still has little scientific support, further studies should be carried out. However, the echoguided fenestration, with or without chemodenervation should be considered as a therapeutic approach.

PP317
MANAGEMENT OF CHRONIC SHOULDER PAIN AFTER BREAST CANCER SURGERY WITH BOTULINUM TOXIN

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Introduction: Pain is the most frequent symptom after the surgical treatment of breast cancer. Its prevalence may vary depending on the series (20% - 60%). Retraction of the pectoralis major muscle (RPM) is the most frequent cause of the upper limb dysfunction.Our aim is to evaluate if the infiltration with Botulinum toxin A (Botox®) is an effective treatment of this pathology.
Materials and methods: 6 women diagnosed of RPM one year after breast cancer surgery. They were infiltrated and included in a physiotherapeutic treatment program. The protocol included a 2nd visit 1 month after infiltration and a 3rd visit 4 months post-infiltration. Scales: Pain (EVA), Shoulder functionality (Constant), Quality of life in cancer patients (SF-36)
Results: Age average: 51. Two in six received mastectomy, three in six patients received lumpectomy. Axillary dissection was required in all of them. Four in six were treated with radiotherapy and chemotherapy. Lymphedema was present in 5 women.

	1st Visit Examination pre-infiltration	**2nd Visit First month after infiltration**
Constant Scale	49.14/100	67.14/100
EVA	6.8/10	3.2/10
SF-36 Physical	57.74/100	54.49/100
SF-36 Mental	49/100	61.83/100

Punctuations in EVA scale diminished around 3-4 points after the infiltration. Shoulder functionality improved in all cases. Punctuations in mental range of SF-36 scale were higher one month after infiltration in every patient. Punctuations were invariable in 3rd visit. Only one infiltration was required. No side effects detected. Limitations: statistical significance is not calculated due to the little number of the sample.
Conclusions: Differencial diagnosis of the most frequent pathologies in upper limb after breast surgery should be taken in consideration. The use of Botulinum toxin tipe A in RPM is revealed as an effective option of treatment. The infiltration in major pectoralis haven't leaded to any complication to patients affected by upper limb lymphedema.

PP318
PAINFUL SHOULDER TREATMENT-COMPARATIVE STUDY

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Introduction: Painful shoulder syndrome is a complex reaction of the soft tissue structural as a multifactorial effects. Most of all it is Egzogen factors with additional specific sensation. Pain is a warning signal, represents potentially dangerous tissue damage. Most common reasons for the painful shoulder are: tenosynovitis, muscle tension, ligament, capsule, bursa…
Purpose: Treatment of the two groups of the patients with the same symptoms using two different protocol.
Methods: During six months registration of the two groups of the patients by fifteen persons classified by sex, age, degree of the pain by VAS scale, limited range of motions. First group of fifteen patients with acute shoulder pain treated in acute stage with steroid block injection, with following kinesy treatment. Second group of fifteen patient have been treated standard physical therapy: criotherapy, sonophoresis, - etofenamate - jelly with high absorption through the skin tissue and verified high concentration in inflamed tissue than in healthier one; analgesic currents, kinesiotherapy.
Results: Six months study result, with checkup after 15 days, and 30 days. It is significant better result after fifteen days in firs group with reduce pain and improved range of motion. After 30 days there is no significant difference at both groups.

PP319
PHYSICAL MEDICINE AND REHABILITATION IN TEMPOROMANDIBULAR JOINT ARTHROPLASTY: TWO COMPLEX CASES

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Introduction and purpose Temporomandibular joint (TMJ) dysfunction is an increasingly frequent pathology in our specialty. Owing to the surgical advances in this field, the clinical cases we encounter are becoming much more complex. Total alloplastic TMJ reconstruction is one such intervention. Rehabilitation protocols are being developed to guide both pre and post-surgical treatments. Sometimes, however, highly complex cases are beyond the scope of these protocols.
Material and methods: We describe two case reports of TMJ ankylosis which underwent joint replacement following a two-stage surgical approach. In both cases, a pre-surgical protocol was implemented to gradually increase mandibular aperture. A silicone spacer was inserted during the first intervention and the joint replacement was fixed in place during the second procedure. In the postoperative period it was observed that in both cases there was an inability to elevate the mandible.
Results: Diagnostic studies were performed to determine the reasons for incomplete mandibular closure. In one case, this inability was due to severe atrophy of mandibular elevators secondary to long-term treatment of dystonia with botulinum toxin. This had previously gone unnoticed in the presence of the ankylosis. In the second case, it was discovered that the motor branch of the trigeminal nerve had been damaged, probably as a result of multiple previous interventions. Combining rehabilitation strategies and optimising analgesia resulted in an acceptable mandibular closure in both cases, enabling improvements in speech and masticatory function.
Discussion and conclusions: Rehabilitation after TMJ replacement usually follows a common set of steps. When progress is torpid, we must consider the presence of other factors which can hamper the surgical outcomes. Once these factors have been identified, our priority is to narrow down the treatment options to minimise disability and achieve the best function possible.

PP320

THE EFFECTIVENESS OF PHYSIOTHERAPY IN THE MANAGEMENT OF TEMPOROMANDIBULAR DISORDERS: A SYSTEMATIC REVIEW AND META-ANALYSIS.

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Introduction: Temporomandibular disorders represent the most common chronic orofacial pain condition. Physiotherapy is one of the treatment options, notwithstanding its effectiveness is still controversial.
Purpose: To analyze the methodological quality, summarize the findings and perform a meta-analysis of the results from randomized controlled trials that assessed physiotherapy management of TMD effects'.
Methods: A literature search was performed through eletronic databases as Pubmed®, Science Direct® and EBSCO. The articles were independently assessed by two raters, for its quality using PEDro scale, Jadad scale and also analyzed through the Cochrane risk of bias tool. A meta-analysis was conducted to obtain summary estimates of the standardized mean difference (SMD) and the corresponding 95% confidence intervals (95%CI), using the DerSimonian-Laird random effects method. Between-study heterogeneity was computed, and publication bias was assessed.
Results: Seven articles met all the inclusion criteria and were included, corresponding to nine estimates of SMD. The meta-analysis showed that, for pain, the summary SMD favoured physiotherapy (SMD=-0.63 [-0.95, -0.31], number of studies=8, I^2=0.0%), while for active range of movement the differences between intervention and control group were not statistically significant (SMD=0.33 [-0.07, 0.72], number of studies=9; I^2=61.9%).
Discussion and conclusions: Physiotherapy seems to lead to decreasing pain and a tendency to improve active range of movement was also observed. However these recommendations should be analyzed with caution due to the small number of included studies and to the wide range of instruments used to measure these effects. Physiotherapy is one of the treatment options, notwithstanding its effectiveness is still controversial.

PP321

EFFICACY AND SAFETY OF TRANSCRANIAL DIRECT CURRENT STIMULATION IN FIBROMYALGIA: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Objective: To evaluate the efficacy and safety of transcranial direct current stimulation for fibromyalgia. Data Sources: We searched databases, conference records, and registered trials for articles published from the database beginning through October 2015. Study Selection: Six trials (1-6) (n=192) were included. Data Extraction:Our meta-analysis was divided into three groups according to stimulation site. Data Synthesis:Significant improvement in pain and Fibromyalgia Impact Questionnaire (FIQ) scores was seen with anodal transcranial direct current stimulation (tDCS) over the cortex-M1. However, the pressure pain threshold did not improve. Anodal tDCS over the dorsolateral prefrontal cortex (DLPFC) was more effective in reducing pain and improving the quality of life compared to sham stimulation, but the difference was not statistically significant (P>0.05). Cathode tDCS over the left cortex-M1 was more effective in improving the pressure pain threshold compared to sham stimulation, but the difference was not statistically significant (P>0.05). No significant adverse effects were seen.
Conclusions: Anodal tDCS over the cortex-M1 is more likely to relieve pain and improve quality of life, but does not improve the pressure pain threshold. Anodal tDCS over the DLPFC also provides inadequate relief. However, the trials vary regarding the stimulating sessions and the sample size was small.

PP322
AXILLARY WEB SYNDROME IN BREAST CANCER PATIENTS

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Introduction: The first time that the expression Axillary Web Syndrome (AWS) appeared in the literature was in 2001, to describe the pathologic triad of postoperative pain, decreased range of motion of the ipsilateral shoulder and a cord-like structure extending from the axilla into the ipsilateral arm that can arise after breast cancer surgery. AWS is becoming an increasingly recognized complication in these patients.
Methods: The authors reviewed the literature about Axillary Web Syndrome.
Results: Axillary Web Syndrome is a cause of significant morbidity following axillary surgery but there is a large variability in the reported incidences (6-72%). Its pathogenesis, risk factors, evolution and treatment are also controversial. AWS can rarely be associated with sub-cutaneous nodules which need investigation until metastases are ruled out. Although Axillary Web Syndrome is described as a self-limiting condition, in our practice education and physiotherapy treatment seemed to help in limiting subsequent shoulder dysfunction. We also found some chronical cases of AWS, which needed a specific approach.
Conclusions: Further research is needed especially to develop a standardized therapeutic intervention for Axillary Web Syndrome.

PP323
THE CHALLENGE OF REHABILITATION PROGRAM IN PALLIATIVE CARE – A THEME TO REFLECT

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Introduction: Rehabilitation is the process that helps a person to reach psychologic, physical, social and educational potential with physiologic or anatomic impairment, desires, and life ambitions. Disability in patients at palliative care units, results from deconditioning, bed rest, musculoskeletal and neurologic complications. Rehabilitation and palliative care have emerged as two important parts of medical care for patients with advanced disease. Rehabilitation professionals aim to improve patients' physical function and independence as long as possible to improve quality of life (QOL) and patients' dignity.
Methods: Literature review. The authors reflect the role of rehabilitation interventions in palliative care. Databases of Cochrane Library and Pubmed were search.
Discussion: Palliative care and rehabilitation have a multidisciplinary model of care, which aims to improve patients' levels of function, comfort and dignity. There is few evidence that rehabilitation can impact function and symptom management in palliative care. However, experience suggests that the application of the fundamental principles of rehabilitation medicine is likely to improve their care.The use of physical modalities can be implemented at bedside and aid in the pain management, decreasing the need for pain medications. Rehabilitation therapy focus on patient education regarding comfortable and safe positions in which to rest or sit. Passive, active, and active-assisted motion exercises and gentle strengthening exercises can aid in the maintenance of strength and joint range of motion. The prescription of assistive devices, and the teaching of compensatory techniques for mobility can aid in ambulation. There is also evidence that immune function may be improved by moderate exercise.
Conclusions: Future research should focus on the role of rehabilitation and defining appropriate interventions. The development of an evidence-based body of knowledge will ensure that these patients receive appropriate rehabilitation interventions improving their QOL.

PP324
CHONDROSARCOMA: WHEN THE UNLIKELY BECOMES LIKELY

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Introduction: The chondrosarcoma (CS) is a tumoral lesion of cartilaginous origin, representing the second most common primary malignant bone tumor, second only to Osteosarcoma, occurring mainly in the pelvic bones and in the metaphysis of long bones.
Method, purpose and results: The authors highlight a case report of a 59-year-old patient, caucasian, with a history of hypertension, pharmacologically treated, referred to a Physiatric consultation by the attending physician. A history of left shoulder pain of over 6 months evolution, with nightly aggravation and after exertion, absence of other accompanying symptoms. Physical examination revealed a local pain from palpation with range-of-motion preserved, though painful, kept above 60 ° of anterior and lateral elevation. Laboratory study without changes. Left humerus X-ray revealed extensive neoformation, partially occupying the humeral epiphysis with meta-diaphyseal extension, cortical integrity and exuberant microcalcifications, confirmed by CT and MRI. Bone biopsy was performed, histologic evaluation revealed a CS degree I. The patient underwent surgical treatment, with curettage and phenolization of the lesion, subsequently filled with bone cement. It was again referred to Physiatric care for enhancement of the left upper limb functionality. To date, a favorable clinical course has been observed.
Discussion: Conventional CS represents about 85% of cases, classified according to their location in bone into central or peripheral, and histologically categorized into three different stages (I, II and III). The peak incidence is between the 4th and 5th decade of life, exhibiting a male predominance, and a clinical condition characterized by a long period evolving local pain with nightly aggravation. Prognosis depends on lesion size, anatomical location and histological stage, carrying the axial located tumors a more guarded prognosis.
Conclusions: This clinical case report intends to highlight the importance of high index of suspicion to an early recognition of this nosological entity and its effect on the outcome.

PP325
A RARE CASE OF ISOLATED HOMONYMOUS HEMIANOPIA- CLINICAL CASE AND REVIEW OF REHABILITATION STRATEGIES

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Introduction: 26 year old patient, with no previous medical history. Complaints of severe constant holocranial headaches, nausea and visual disturbances (photophobia, intermittent diplopia and binocular scotoma), with one month of duration. Referred for Neurosurgical evaluation. MRI revealed a T1-T2 isointense expansive right temporal lesion with irregular contours with basal ganglia and cerebral pedunculum deformation. Patient was submitted to a navigation-oriented removal of the space occupying lesion. Pathohistological examination revealed a Giant Cell Glioblastoma (WHO classification grade IV). Examination on MPR consultation revealed an isolated left homonymous hemianopia. Due to the prognosis and need for adjuvant CT/RT, a rehabilitation program was designed.
Methods: Pubmed database search using the terms “rehabilitation”, “homonymous hemianopia”, “isolated”.
Results: The initial search revealed 76 papers. After abstract revision, 15 papers were selected. Rehabilitation programs may include optical aids (hemianopic spectacles and prisms), cognitive rehabilitation techniques (compensatory oculomotor strategies, visual exploration and reading exercises).
Discussion and conclusions: Patients with hemianopia have difficulties with reading and scanning scenes fast enough to have a correct perception and adequae response. Consequently,they fail to notice relevant objects or avoid obstacles on their affected side which may seriously affect private and vocational ADLs and even reveal dangerous. Given the relative importance of vision as a sense, the treatment of hemianopia should assume a priority role for neurological rehabilitation programmes.

PP326
USE OF ADJUSTABLE COMPRESSION VELCRO WRAP (ACW) IN BREAST´S CANCER LYMPHEDEMA MANAGEMENT – A CASE REPORT

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Introduction Secondary lymphedema affects 30% of women after breast cancer surgery and has adverse physical and psychosocial consequences. Lymphedema is more frequent in women who have undergone axillary lymph node dissection, sentinel lymph node biopsy and/or radiation. Decongestive lymphatic therapy (DLT) and multi-layer bandages are the standard treatment for moderate/severe edema but they are bulky, time-consuming and can only be applied by specialized professionals. Adjustable compression wraps (ACW) are a new alternative, less bulky and easy to apply.
Case report 46 year-old woman with breast cancer underwent bilateral reduction mammoplasty and left axillary lymph node dissection in April/2011, adjuvant chemotherapy (CT), radiotherapy (RT) and hormone therapy. After CT (September/2011) she presented with mild lymphedema that resolved with 1 month rehabilitation. At the end, a class II, circular-knit compression armsleeve was provided. After RT (January/2012), she presented again with lymphedema, repeated rehabilitation with improvement (residual asymmetry of the forearm 1,5cm), and was referred for maintenance treatment. In 2013, she had 3 episodes of erysipela. In September/2014, revalued in our hospital, she had a firm edema with arm and forearm asymmetry of 6cm and 11,5cm, edema of the hand and fingers. She started DLT, 5 sessions/week, application of bandages on the fingers and hand and ACW (Juxta-Fit® armsleeve) that the patient kept 23h/day. After 6 weeks, edema was softer and the volume reduced 4cm in the arm and 6cm in the forearm (final asymmetry of 2cm and 5,5cm). A class II, flat-knit sleeve was prescribed for maintenance.
Discussion and conclusions ACW is successful in the treatment of arm lymphedema, with results similar to standard treatment. Being less bulky and self-adjustable it allows more freedom of movement and greater comfort. A hand wrap or glove may be used in combination but in our experience, bandage is more effective for edema of the fingers.

PP327
EFFECTS OF GROUP REHABILITATION PROGRAM ON CARDIOPULMONARY FUNCTION, QUALITY OF LIFE IN BREAST CANCER RELATED LYMPHEDEMA PATIENTS

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Introduction: There has been an increase in the cancer survival in the world.
Purpose: To investigate the effect of group rehabilitation program on cardiopulmonary exercise capacity, isokinetic muscle strength, quality of life in breast cancer related lymphedema patients.
Methods: The subjects of this study were patients who had diagnosed breast cancer stage 1-3 and had a lymphedema. A total of two patients (patient group) and four age matched healthy women (control group) were recruited. Cardiopulmonary exercise capacity was measured by symptom limited exercise tests using treadmill and gas analyze system. Muscle strength was measured using isokinetic exercise machine. All patients participated in 4 weeks rehabilitation program that consists of aerobic exercise using treadmill, ergometer and muscle strengthening exercise using theraband. The exercise intensity started with 50% and increased up to 80%.
Results: Before rehabilitation program, lymphedema group had significant lower exercise capacity in metabolic equivalent tasks[mean 5.06 METs], Peak oxygen consumption[mean 16.87ml/kg/min] compared to healthy control group. Healthy group recorded 7.45 METs, 26.12ml/kg/min VO2 peak on average. But there were no significant difference between patient group and control group in muscle strength. After 8 weeks, 2 patients who conducted rehabilitation program recorded 5.65 METs, 19.75 VO2 peak on average. In psychological aspect, average BDI scale was reduced by 4 points. Average FACT-G scale was increased in all categories including physical wellbeing, social wellbeing, emotional wellbeing, functional wellbeing. In QLQ – C30, patients reported much less fatigue, nausea & vomiting, dyspnea, loss of appetite, symptoms.
Conclusions: Our results showed that compared to the healthy group, breast cancer patients had lower cardiopulmonary exercise capacity. When patients went on exercise rehabilitation programs, there were significant changes in cardiopulmonary function, muscle strength, quality of life. Although patients performed muscle strengthening exercise, there were no aggravations of lymphedema in both patients.

PP328
PRELIMINARY EVALUATION OF COURSE AFTER STOPPING GARMENT USE IN UPPER LIMB LYMPHEDEMA

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Introduction - Most guidelines recommend the use of compression garments in the treatment of lymphedema, but there is no information about when to stop using them. We observed in our clinical practice that some breast cancer related lymphedema (BCRL) does not progress, but stabilizes or even improves. Moreover, some patients who decided to stop using garments on their own initiative did not worsen.
Purpose - The objective of this study was to compare the evolution of patients who stopped using garments (SUG) with those who continued using garments (CUG).
Methods - Patients with BCRL who had stabilized volume excess (changes <5%), without inflammatory complications the last 12 months, and without symptoms of worsening while not using garments, were offered to stop using garments in a progressive and monitored way. They were followed-up after 2 years and compared with the CUG group. Outcomes were change in excess of volume (obtained by perimetry) and inflammatory complications.
Results - 76 patients were included, 16 of them in the SUG group. In 41 patients the lymphedema severity was mild, and in 35 was moderate (<20% and 20-40% excess of volume respectively). There were 2 (12.5%) patients with inflammatory episodes in the SUG group, and 9 (15%) in the CUG group. Three patients of the SUG group should return to garment use. The mean change in excess volume after 2 years was of 0.8% (SD 5.8) for the SUG group, and of -0.5% (SD 12.9) for the CUG group, p=0.563. Differences stratifying by lymphedema severity were not significant either.
Discussion and conclusions - There were no significant differences in the excess of volume change between SUG and CUG groups at 2 years. More research is warranted to determine which selected, stabilized lymphedema patients could benefit from this reduction in the burden of self-care.

PP329
PSYCHOLOGICAL RESILIENCE AND ILLNESS PERCEPTION CHANGES DURING ONCOGYNAECOLOGICAL REHABILITATION

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Introduction: The illness perception and psychology resilience are the important factors affecting the medical, psychological and behavioral outcomes during oncogynaecological disease. They are changing, and changing the patient‘s well-being.
Purpose: to identify illness perception and psychology resilience changes during oncogynaecological rehabilitation and the interfaces of these two aspects.
Method: study of 67 women from Medical SPA Eglės Sanatorija. The Illness Perception Questionnaire–Revised (IPQ-R) (Weinman ir kt.,1996) was used for the research of illness perception. Dispositional Resilience Scale, DRS15-R (Bartone, 2007) was used for the research of psychological resistance. The study participants were interviewed at the beginning and at the end of rehabilitation.
Results: at the beginning of the oncogynaecological rehabilitation, rather than at the end, women characterized by negative emotions ($p<0,0001$). Middle-aged women with higher and lower education, the consequences of the disease seen as more complicated and meaningful ($p<0,002$). At the end of oncogynaecological rehabilitation, rather than at the beginning, women's higher psychological resistance relates to higher personal control, treatment control, illness coherence (depending on the socio-demographic indicators) and a lower emotional representations, consequences and timeline cyclical indicators assessment ($p<0,001$). Higher illness perception assessment in personal control indicator predicts education and psychological resistance in control and challenge scales.
Discussion and conclusions: during oncogynaecological rehabilitation for the illness perception and psychology resilience have influence age of woman, level of education, family status, period of rehabilitation. At the end of rehabilitation women's higher psychological resistance relates to higher personal control, treatment control, illness coherence and the lower emotional representations.

PP330
THE CHANGES OF POSTURAL BALANCE DURING SITTING AFTER UNILATERAL MODIFIED RADICAL MASTECTOMY

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Introduction Patients with breast cancer have suffered back pain and trucal imbalance after modified radical mastectomy group (MRM).
Purpose The aim of this study is to investigate the changes of postural balance during sitting after unilateral MRM.
Methods Participants were classified into control (n= 8), right MRM (n=8) and left MRM (n=8). They all were right hand-dominant, between 35 and 55 years old. The patients with breast cancer were enrolled 1 year after MRM. We measured pelvic and shoulder asymmetry as difference of both the iliac crests of pelvis and clavicle by using whole spine anteroposterior and lateral view. Postural balances were evaluated by unstable hip board with 3-axis accelerometer under two conditions. In dynamic sitting condition, subjects performed anterior, posterior, left, right tilting induced by the board for 5 seconds, respectively. Inclination angle was measured by accelerometer which was attached to the center of the unstable board. Muscle activation patterns were recorded using the NoraxsonTelemyo 2400T (Noraxson Inc., Scottsdale, USA). Wireless surface electrodes were attached to the external oblique, thoracic erector spinae, lumbar erector spinae, and lumbar multifidus muscles, bilaterally.
Results During anterior tilting, reverse direction of left-right inclination angle between both MRM are found ($p<0.05$). In right MRM, inclination angle was 0.55 to left side, whereas in left MRM the angle was 0.39 to right. At the same time, both side thoracic erector muscles are activated differently(Left side=0.58, Right side=15.02 in Right MRM). During posterior tilting, there are no difference among 3 groups(Right MRM=0.09, Left MRM=0.2, control=0.12) In MRM, pelvic elevation on mastectomy side were shown (3.36±0.53mm).
Discussion and conclusions We concluded that unilateral MRM cause postural asymmetry and muscular imbalance in sitting. And we need to focus on treating postural imbalance of patients with breast cancer.

PP331
SUPRASCAPULAR NERVE BLOCK IN CHRONIC SHOULDER PAIN – A SYSTEMATIC REVIEW.

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Introduction: Shoulder pain is a complaint associated with a high morbidity, with an estimated one year prevalence in the general population between 5-47%. In the last years, central nervous system modulation techniques have been emerging as pain management treatments, as a broader pain definition emerged. The suprascapular nerve block (SSNB) has recently gaigned relevance, being associated with high pain and function improvements, associated with cortical silent periods.
Purpose:To find the existing evidence about SSNB in chronic shoulder pain, including it's efficiency, indications and side effects.
Methods: The term "suprascapular nerve block" was searched at PubMed, in October 2015, with 156 analysed articles. The inclusion crieria were experimental studies with non-continuous suprascapular nerve blocks in patients with chronic shoulder pain not surgery-related.
Results: After the application of the inclusion/exclusion criteria, 8 studies were selected: 7 randomized controlled trials and 1 case series. Of these trials, only 2 were placebo controlled with saline injection. The most frequent pathologies were adhesive capsulitis, hemiplegic shoulder pain and glenoumeral osteoarthritis. The procedures were guided by ultrasound, electromyography or anatomy landmarks and the most frequent drugs used were a mixture of bupivacaine and metilprednisolone. All the studies reported significant improvements in pain and range of motion scores ($p<0.05$), which are analyzed.
Discussion: There are multiple variations among the studies, from the number of injections (1-3), the drugs used (with or without corticosteroid), the studied pathologies and the control groups. However, across all the studies there is a longitudinal improvement in patient's pain and range of motion scores, without significant side effects.
Conclusions: SSNB is a safe and effective treatment in chronic shoulder pain. Additional quality studies are needed to find in which pathologies it may be useful and which are the most efficient injected drugs and treatment regime.

PP332
BOTULINUM TOXIN TYPE A FOR PAIN MANAGEMENT – PROPOSED MECHANISMS IN PAIN

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Introduction: Despite the initial thought that Botulinum Toxin (BT) could inhibit acetylcholine release only at the neuromuscular junction, now it's widely accepted that it can also inhibit acetylcholine release at autonomic cholinergic nerve terminals, as well as peripheral release of neuro-transmitters involved in pain regulation. The underlying pharmacological mechanisms that operate in reducing pain are still unclear but include: blocking nociceptor transduction, the reduction of neurogenic inflammation by inhibiting neural substances and neurotransmitters, and the prevention of peripheral and central sensitization.
Purpose: To review the present scientific literature in what concerns the probable mechanisms of action of Botulinum toxin in the nociceptive system.
Methods: A search was conducted in PUBMED-MEDLINE and Scopus with the following MESH terms: Botulinum Toxins; Pain; Nociception; Central Nervous System. Articles published between 2008 and 2015 were analysed.
Results: In what concerns mechanisms of action of Botulinum toxin and nociceptive system different actions seem to be involved: blocking nociceptor transduction; reduction of neurogenic inflammation; ganglion inhibition; spinal and suprasegmental level inhibition; retrograde axonal transport of BT suggests the involvement of CNS; prevention of BT effects on pain and c-Fos expression by opioid antagonists suggest that action of BT might be associated with the activity of endogenous opioid system.
Discussion and conclusions: The use of BT could be an important and promising therapeutic strategy for pain management whenever common pharmacological tools have been ineffective. More research on the mechanistic properties and interaction of botulinum toxin with the nociceptive system is needed to better understand the potentials of its. In what concerns clinical research, large and well-designed clinical trials are needed to recommend botulinum toxin for pain management in the different clinical pain syndromes.

PP333
PSYCHOLOGICAL AND SOCIAL ASPECTS OF PAIN TREATMENT

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Introduction Pain experience is an inseparable part of almost any disease or illness. A healthy person develops techniques and strategies to cope with discomfort. The situation radically changes when accidents as a result of random life changes occur and a healthy person becomes ill. This person becomes the patient. The first signal that accompanies the patient is pain, both physical and psychical. The research also includes pain and feeling of depression from the patient's and the therapist's point of view.
Purpose The aims of the study was to investigate how pain affects patients' lives and whether their physical and mental health improves as a result of the treatments, to demonstrate the influence of therapist's presence on the reduction of pain intensity felt by the patient and the differences between assessment of pain intensity perceived by the physiotherapist and the patient.
Methods The subject of study was pain and an explanation of concepts associated with it, physiotherapy in the prevention and pain relief as well as pharmacological and no pharmacological methods of its treatment. Tests were carried out with the use of McGuill's questionnaire and Beck's Scale which assesses level of depression. All tests were conducted in population of 64 patients in the period October 2014 to April 2015.
Results Continuous rehabilitation care has strong influence on pain reduction. Diseases or dysfunctions associated with pain and suffering are felt subjectively by the patient. Physiotherapist assess the degree of patient's pain in different way as his/her patient, they differ in pain assessment from each other.
Discussion and conclusions As a result of illness patients experience severe pain and experience stress associated with treatment and physiotherapy. After the treatment patients express a strong sense of well-being. The physiotherapist assesses differently the level of occurring pain than the patient and the physiotherapist specifies differently the level of suffering than the patient.

PP334
BALNEOTHERAPY IN CHRONIC LOW BACK PAIN

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Introduction Pain is defined as an unpleasant sensory and emotional experience on a real or potential tissue damage, according to the International Study of Pain. Back pain is the leading cause of disability in most of the active population under 45 years and the second leading cause of medical referral to a GP consultation. It is therefore necessary to establish well known criteria evaluation and targeted diagnosis of the chronic low back pain due to the multifactorial and diversity of the lumbar pathology: spinal, muscular, renal, rheumatology.
Purpose The aim of the study was to establish the importance of balneotherapy using mud therapy and salty water from Techighiol lake in the treatment of the chronic lumbar pain.
Methods From February 2014 to February 2015, a research, which implied the analysis of 1264 patients who had the main symptom anamnesis: chronic back pain, has been conducted. A certain number of rating scales, including VAS, Oswestry Scale, scale of pain intensity , Schober test, quality test of life, were analysed. These scales have been inserted into a patient questionnaire presented both at admission and at discharge. Patients underwent a balneotheraphy rehabilitation program for 10 days in Balneal and Rehabilitation Sanatorium Techirghiol including: sapropelic mud therapy, hydrotherapy with salty water from Techirghiol lake, physiotherapy, kinetotherapy and massage.
Results In 78% of the cases studied there was an improvment of the Visual Analog Scale at the end of the treatment. In 34% of the cases studied had a improvement of the quality test of life. In Schober test 67% of the patients had a favorable outcome.
Discussions and conclusions Rehabilitation program with mud from Techirghiol lake resulted in significant improvement in pain decrease during the treatment and in some cases up to its complete disappearance. The balneotherapy had the most impact in improving chronic lumbar pain tolerance.

PP335
THE EFFECT OF MULTIDISCIPLINARY REHABILITATION TREATMENT ON THE SPOUSES OF PATIENTS WITH NON-SPECIFIC CHRONIC PAIN.

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Introduction: Research has given insight in the influence of the spouse on the complaints of the patient with non-specific chronic pain (CP) and vice versa. The effect of multidisciplinary rehabilitation treatment (MRT) on the spouse of the patient has not been studied yet.
Purpose: To investigate whether MRT of patients with chronic non-specific pain also affects their spouses.
Methods: Prospective cohort study**.** Patients with CP, admitted to an outpatient rehabilitation treatment, and their spouses are asked to fill out questionnaires at: T1 pre-treatment, T2 start of treatment, T3 end of treatment, T4 three months after treatment. Primary outcome measure: psychological distress of the partners (Symptom Checklist-90,SCL-90, range 90-450). Secondary outcome measures: strain of spouse (Caregiver Strain Index, CSI, range 0-13) and Life Satisfaction Questionnaire-9 (LISAT, range 1-6).
Results: Twenty-six partners were included. Mean of the scores (and standard deviation [SD]) at T2 and T3 of the scores of SCL-90 were 117 (SD 30) and 115 (SD 36) respectively. The CSI scores lowered between T2 and T3 from 4.1 (SD 2.9) to 3.5 (SD 2.7). LISAT domains were respectively at T2 and T3 for 'Life as a whole' 4.8 (SD 0.9) and 4.9 (SD 0.9), Sex life 4.3 (SD 1.2) and 4.3 (SD 1.4), Partner relationship 5.3 (SD 0.7) and 5.4 (SD 0.7) and Family life 5.1 (SD 0.6) and 5.2 (SD 0.7). No significant differences were found. The data of T1 and T4 and data of other measurements will be presented at the conference.
Discussion and conclusions: There is a tendency that the strain of the spouses was reduced by MRT of patients with CP. However, differences are not significant. The score on the SCL-90 and life satisfaction of the spouses are in the range of the general population and did not change during the MRT.

PP336
EFFECT OF PULSED RADIOFREQUENCY APPLIED TO PERIPHERAL NERVE ON THE EXPRESSION OF TUMOR NECROSIS FACTOR-ALPHA IN NEUROPATHIC PAIN

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Introduction: Radiofrequency (RF) has been used for the treatment of neuropathic pain. Pulsed RF (PRF) is known to have analgesic effect by mechanisms other than heat transfer.
Purpose: We aimed to investigate the effect of pulsed radiofrequency (PRF) applied proximal to the injured peripheral nerve on the expression of tumor necrosis factor-á (TNF-á) in a neuropathic pain rat model.
Methods: Nineteen male Sprague-Dawley rats were used. All rats underwent chronic constriction injury (CCI) procedure. After 7 days of CCI, withdrawal frequency of affected hind paw to mechanical stimuli and withdrawal latency of affected hind paw to heat stimulus were measured. They were randomly divided into 2 groups i.e., (A) CCI group (n=9); and (B) CCI treated with PRF group (n=10). Rats of group B underwent PRF procedure on the sciatic nerve. Withdrawal frequency and withdrawal latency were measured at 12 hours, and 7 days after PRF. Immunohistochemistry (IHC) and Western blot analysis were performed using a TNF-á antibody.
Results: Before PRF, withdrawal frequency and withdrawal latency were not different in both groups. After PRF, withdrawal frequency decreased and withdrawal latency prolonged over time in group B. There was significant interaction between time and group for each withdrawal frequency and withdrawal latency. Group B showed decreased TNF-á immunoreactivity of the spinal cord and sciatic nerve at 7 days.
Discussion and conclusions: TNF-á is one of the major players in the development and maintenance of neuropathic pain. PRF is considered as a nondestructive and reversible neuromodulation intervention. PRF stimulation applied proximal to the injured peripheral nerve alleviated neuropathic pain by CCI. The reduction of neuropathic pain after PRF treatments may be associated with neuromodulation effects through the inhibition of the expression or antegrade transportation of TNF-á.

PP337
NON-UTILIZATION OF MEDICAL REHABILITATION BEFORE THE OCCURRENCE OF EARLY RETIREMENT DUE TO UNSPECIFIC BACK PAIN IN GERMANY – PREVALENCE AND SOCIODEMOGRAPHIC CORRELATES

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Introduction: In Germany the statutory pension insurance fund covers the cost of rehabilitation treatment for employees whose working capacity is endangered due to health problems. The underlying principle called "rehabilitation over retirement" is the concept to avoid early retirement due to health problems by rehabilitation. Because of the impact of medical rehabilitation among patients with unspecific back pain this principle should be most closely implemented among these patients.
Purpose: To describe the utilization of medical rehabilitation before the occurrence of early retirement due to unspecific back pain in Germany from 2003 to 2013 and to investigate potential sociodemographic determinants.
Methods: Analysis based on 20% random samples of administrative pension records from the Research Data Centre of the German Federal Pension Insurance, which include of all new cases of early retirement. We used logistic regression models to investigate the risk of non-utilization of medical rehabilitation during five years before the occurrence of early retirement. Age, sex, citizenship, marital status, school and vocational education, professional career and annual income were considered as potential risk factors.
Results: Among all early-retired patients due to unspecific back pain 42.7% (5345 out of 12525) did not utilized medical rehabilitation during five years before the occurrence of early retirement. Risk factors for non-utilization were to be unmarried or widowed (vs. married, adjusted OR: 1.3; 95% CI: 1.2 – 1.4), non-German citizenship (vs. German citizenship, 1.5 [1.3 – 1.7]), unknown or low educational level (vs. median educational level, 1.5 [1.3 – 1.6]), as well as low annual income (1st quartile vs. 4th quartile; 4.6 [4.1-5.2]).
Discussion and conclusions: Despite the extraordinary importance of medical rehabilitation among patients with non-specific back pain more than 40% of them obtained no medical rehabilitation during five years before the occurrence of permanent work disability, worst affected are deprived persons.

PP338
NONSPECIFIC LOW BACK PAIN AND VITAMIN D DEFICIENCY IN WOMEN

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Introduction: Vitamin D deficiency is linked to several musculoskeletal conditions including nonspecific low back pain, autoimmune diseases. Data regarding to vitamin D deficiency and low back pain are not consistent across various studies.
Purpose: The objective of this case-control study was to determine association of vitamin D deficiency and low back pain in women.
Methods: Eighty-one women with nonspecific low back pain and 101 age-matched controls entered the study. Serum vitamin D was assessed by quantitative determination of serum 25-hydroxyvitamin D (25-OHD) by electrochemiluminescence method, and levels<20ng/ml were considered as vitamin D deficiency. Mann-Whitney U test and chi square test was used for analysis.
Results: Mean age of patients and controls was 35.1±8.14 and 37.4±7.9 years respectively. Median serum 25-OHD concentration in patients was significantly lower than control group (p=0.003). Serum 25-OHD deficiency was observed in 57(70.4%) patients versus 47(46.5%) controls (p=0.001). There was a significant association between serum 25-OHD deficiency and low back pain (OR=2.72, 95%CI, 1.47-5, p=0.001). 25-OHD deficiency was significantly correlated with low back pain (r=0.239, p=0.001).
Discussion and conclusions: This study indicates a significant association between vitamin D deficiency and nonspecific LBP in women and justifies serum 25-OHD assessment in women with low back pain

PP339
THE UTILITY OF THE ICF BRIEF CORE SET FOR LOW BACK PAIN FOR REHABILITATION OUTCOME PROGNOSIS

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Introduction. Biopsychosocial disorders caused by persistent pain in lumbosacral radiculopathy are indication to refer patients to multidisciplinary outpatient rehabilitation (OutR). WHO initiative to introduce ICF in the various fields of medicine, primarily in research projects encouraged the search of factors influencing rehabilitation effectiveness using the ICF model.
Purpose. The aim of the study was to define the patients state according ICF and determine the factors influencing effectiveness of rehabilitation in lumbosacral radiculopathy.
Methods. 111 patients (average age 52.2±11.8 y.) self rated ICF Brief Core set for LBP components in scale from 0 to 4 points at the beginning of OutR. The problems in body functions, activities and participation restrictions were set. Effectiveness of rehabilitation was evaluated by changes in Roland Morris Disability Index and LBP intensity. By these changes patients were divided into groups of lower and higher efficiency of rehabilitation.
Results. Only the factors significantly different between the groups of OutR effectiveness were included into logistic regression analysis. An increase by 1 point in the score emotional functions, physical endurance, sleep functions et al. decreased the odds ratio of effective rehabilitation. The multivariate model indicated that the predictive factors of lower effectiveness rehabilitation were body functioning problems - sensation of pain, OR 0.47; 95% CI [0.23-0.94] and sleep disorders, OR 0.64; 95% CI [0.42-0.98].
Discussion. Correlations between sleep disturbance and LBP intensity were found and the management of sleep problems as a goal of rehabilitation in LBP was emphasised by a few authors. Our findings indicated that problems of pain sensation, together with sleep disorders, negatively influenced outcomes of rehabilitation. Predictive value of the results should be verified by further studies.
Conclusions. Self rated ICF categories are useful to set the main problems of patients, but application of the ICF Core sets for outcome prognosis remains uncertain.

PP340
CASE PRESENTATION - FEMURO-ACETABULAR IMPINGEMENT WITH SCIATIC NERV INJURY

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Introduction: Femuroacetabular impingement (FAI) is a pathological hip condition characterised by abnormal contact between the acetabulum and femoral head–neck junction.
Scope backround: We present the case of 53 years old woman, which presented to as with pain located in right leg started from the posterior thigh to plantar side of the foot. Also she described paresthesia in the plantar region of the foot and fingers.
Material and methods: The patient was evaluated clinical, paraclinic and imagistic.
Results: We noticed that the patient presented an old paresis of right sciatic nerve secondary to lumbar disk hernia. She describes symptoms only in the right leg without low back pain. The pain is more intensive when the patient is in standing and she has a limping walk. The simptomatology was triggered by the physical effort of lifting some weight. The pathology was shown by imagistical means MRI and radiological. The evolution was favorable using hydro-therapy, kineto-therapy in the salty pool and not for the last electro-therapy. In addition we recomanded her to use a cane untill her complet recovery, means the diesappearence of the pain and normal walking.
Discussion and conclusions: The particularity of the case is given by the rarity of impingement syndrome, difficulty in diagnosis due to association with sciatic nerve injury

PP341
PRENATAL DIAGNOSTIC SEVERE FETAL HYPERLORDOSIS, A CASE REPORT

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Introduction We present a case of a newborn gestational age 38+2 born emergency Caesarean section in the second pregnancy. It has been high risk because of the results of the sonography of the third trimester. They discovered a fetal malposition with hyperlordosis and suspicious of hypospadias. Genetic amniocentesis revealed a normal karyotype (46,XY). A male neonate was delivered with a weight of 3300g and length 48 cm. Apgar scores of 3 and 9 at 1 and 5 minutes, respectively, and a 7,33 cord blood pH. The neonate was discharge on day 4 of life. The patient was visited in our Rehabilitation department two weeks later and we diagnosticated him of severe fetal hyperlordosis, plagiocephaly and congenital torticollis.
Purpose The purpose of the present clinical case was to report the benefits of physical therapy in severe fetal hyperlordosis and plagiocephaly
Methods Rehabilitation program was carried out three times a week during ten months and twice a week during five months. We combined physiotherapy, osteopathy and early stimulation.
Results A complete correction of axial tone, plagiocephaly and congenital torticollis was resolved. The patient was able to walk alone and he has not asymmetries in tone of strength. Due to the good clinical evolution of the patient, he was discharged after 15 months of treatment.
Conclusions We conclude that an early rehabilitation programme could benefit patients from fetal severe hyperlordosis and its associated disorders.

PP342
POTT'S DISEASE: A DIAGNOSIS TO CONSIDER WHILE APPROACHING A CHILD WITH SCOLIOSIS

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Introduction Scoliosis, an axial deviation of the spine, can be divided in structural or functional, if there is or if there is no rotation of the vertebrae, accordingly.
Purpose Raise awareness to the differential diagnosis in the approach of scoliosis.
Methods The authors present a case report of an 11-year-old male patient who was sent to Physical Medicine and Rehabilitation due to scoliosis and pain.
Results During consultation the patient referred left knee, left hip and back pain. His mother also reported asthenia, anorexia, weight loss, shivering and night sweats, since the last 3 months. At physical examination: painful palpation of the posterior thoracic wall, left knee and left foot, left shoulder elevation and asymmetric gaps between arms and trunk. There was no gibbus deformity during Adam's bending test. The X-ray of the spine showed grade 2 anterolisthesis of L5 on S1 and a scoliotic lumbar curve (Cobb angle 14°) with a compensatory thoracic curve (Cobb angle 7°). There was no rotation of the vertebrae. Due to the alarming signs, a thoracolumbar CT scan was performed, revealing a right-sided expansive paravertebral lesion, between T4-T8, causing destruction of the 5th and 7th ribs. The patient was sent to Paediatrics department and needle aspiration biopsy of the bone lesions was performed confirming the diagnosis of Pott's disease. The patient immediately started antituberculosis drugs.
Discussion and conclusions The absence of vertebral rotation excludes the diagnosis of structural scoliosis and points towards a scoliotic attitude, in this case caused by pain. It's important to remember Pott's disease in the differential diagnosis of scoliosis, especially when systemic symptoms are present. After treatment, the scoliotic attitude of the spine was corrected, as seen on the X-ray. Here, the role of the Physiatrist was extremely important, being aware to all the pathologies that possibly cause scoliosis.

PP343

EVALUATION OF THE IMPACT OF A BEHAVIORAL TASK SCHEDULE ON FUNCTIONNAL INCAPACITY WHILE STRUCTURING A THERAPEUTIC EDUCATIONAL PROGRAM FOR CHRONIC LOW BACK PAIN PATIENTS : PROSPECTIVE INTERVENTIONNAL TRIAL.

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Introduction - Purpose: Evaluation of the impact of a Behavioral Task Schedule (BTS), established according to a method of cognitive behavioural therapy, on functional incapacity in chronic low back pain patients during a functional restoration program.
Methods: Prospective interventional trial « Before- After » use of BTS in chronic low back pain patients (N=71). The evaluation of the functional incapacity (Dallas Pain Questionnaire), the fear-advoidance beliefs (Fear-Avoidance Beliefs Questionnaire) and the psychological aspect (Hospital Anxiety and Depression scale) were assessed during a Multidisciplinary Evaluation Day (MED), hospitalisation and at 3 months follow-up.
Results: The different parameters were improved in the two groups during the trial but without a significant difference between them. The group with BTS had better improvement at 3 months than the group without it (except the work-leisure activities aspect on the Dallas score, with a significant difference at 3 months, $p<0.048$). The global Dallas score improved from the MED (51,2%+/-16,9 without BTS vs 50,4%+/-12,3 with), at discharge (30,0%+/-19,8 without BTS vs 31,9%+/-14,9 with) and at 3 months (28,7%+/-21,2 without BTS vs 23,3%+/-15,5 with).
Conclusions: Functional restoration programs improve chronic low back pain patients in multidimensional ways (physically, psychologically and socially). The use of a BTS does not improve significantly our patients during our trial but seems to improve them at a distance.

PP344
EFFICACY OF EXERCISE THERAPY AND/OR TRANSCUTANEOUS ELECTRICAL NERVE STIMULATION IN PATIENTS WITH ACUTE NON-SPECIFIC LOW BACK PAIN

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Introduction: The current scientific evidence does not support the use of back-specific exercises as a treatment for acute nonspecific low-back pain (LBP). However, some studies suggest that exercise therapy (ET) should start after 2-6 weeks of the onset of symptoms.
Purpose: of this study was to evaluate the therapeutic effect of TENS and back-specific ET in patients with acute non-specific LBP.
Methods: The study included 36 patients (18 male, 18 female, 45.08±9.16 yrs), with acute LBP without pain extension into lower limbs, persisting for 6-18 days (9.86±3.47 days). Therapy was conducted 5 days/week, during 3 consecutive weeks. Patients were randomly assigned to two groups. All patients were treated with TENS – 80Hz, 20 minutes duration for the first 5 days, after which the group A (n=18) was treated with TENS, and group B (n=18) with TENS and ET (specific training of the deep abdominal muscles, with co-activation of the lumbar multifidus). Outcome measures were pain intensity (measured by 10-cm VAS), lumbar mobility (measured by fingertip-to-floor method-cm), and disability (measured with the Quebec Back Pain Disability Scale), on admission and after 3 weeks of therapy.
Results: On admission there were no significant differences regarding gender, age, symptom onset, pain intensity, spine mobility and disability level between groups. No adverse effects were observed during the treatment. Both groups showed significant pain reduction, improvement of lumbar mobility, and reduction of disability after treatment. Group B showed significantly greater reduction in pain intensity and functional disability compared to group A, but there was no significant difference in lumbar mobility between groups after 3 weeks of therapy.
Discussion and conclusions: Both TENS and ET are effective methods in reducing pain and functional disability in the therapy of acute LBP, wherein the initiation of ET in early stages of treatment can be useful.

PP345
IMPACT OF THE KINESIOTHERAPY AND SPINE STRETCHING IN THE VERTICAL BATH ON THE BACK FUNCTION

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Introduction: Implementing the health promotion program, the groups of employees who underwent the kinesitherapy and spine stretching in the vertical bath were selected in Palanga Rehabilitation Hospital. All the employees were complaining of the neck and lumbar pain and tension. Before the procedures and after the procedures the functional examination of the back was carried out with the "Insight" apparatus. The employees were interviewed about the changes in their health status. INSIGHT is the newest and most innovative functional examination of the back health. At the time of this examination 5 parameters are evaluated. They help to assess the neurospinal function and help to prepare the kinesitherapy program.
Parameters: • Algometry (pain mapping). At the time of the examination a map of the pattern of pain along the spine is drawn. • Range of motion. This test measures the range of motion in various regions of the spine. With the help of this test the places with the decreased range of motion are detected. The movement amplitudes may be compared to the normal motion values. • Electromyography. The test evaluates the function of the muscles supporting the spinal column and helps to detect the places where the tension is present. • Thermal scanning. The test helps to evaluate the state of the autonomic nervous system. This result is achieved measuring the temperature differences along the spine. • Pulse wave profile. The test measures your abilities to adjust to the environment. The pulse changes are followed and the tonus and balance of the nervous system are measured. The mean value of these five parameters is calculated. It represents the neurospinal index. On the grounds of the reports of the treated patients about the long-term effects of the kinesitherapy and stretching in the vertical bath, the hypothesis that the neurospinal function of the employees remained similar after one half year period following the procedures was proposed.
Purpose: To assess the impact of the kinesitherapy and spine stretching in the vertical bath on the back function.
Objectives of the research: 1. To evaluate the changes in algometry, the movement amplitude, electromyography, the thermal scanning and the pulse wave profile detected when examining the employees with the "Insight" apparatus before and after the procedures. 2. To evaluate the changes of the neurospinal index before and after the procedures. 3. To find out the changes in the health status of the employees. 4. To examine the employees with the "Insight" apparatus and evaluate the neurospinal index after one half-year period following the procedures.
Methods: Functional examination of the back with the "Insight" apparatus before and after the procedures, subjective inquiry about the health status changes of the employees.
Results: 27 employees feeling the back pain and tension in the neck or lumbar region of the spine participated in the research. 14 employees submitted only the initial results of their examination with the "Insight" apparatus therefore the change in the back function of these employees was not evaluated. Taking into account the data of the examination, the adequate program of the kinesitherapy and stretching was prepared. The change in the mean value of the pain test made 95.16% (maximal value 100%), after the procedures it made 96.73%, the change in the mean value of the movement amplitude made 74.74%, after the procedures it made

75.59%, in the electromyography test: 75.19%, after the procedures: 76.83%, the data of the thermal scanning corresponded to 66.98%, after the procedures: 77.60%, the change in the mean value of the pulse wave test made 71.28%, after the procedures it made 63.41%. The change in the mean value of the neurospinal index made 73.39%, after the procedures it made 76.30%. When one half year passed after the procedures the mean value of the pain test was 96.65%, of the movement amplitude: 75.55%, of electromyography: 76.77%, of the thermal scanning: 77.50%, the mean value of the pulse wave was 70.11%. The neurospinal index was 75.80%. When the employees were interviewed, they reported that they all felt general improvement in their health status, the pain decreased and the quality of their sleep improved.

Conclusions:

• When the test results were evaluated, it became clear that algometry, the movement amplitude, electromyography and the thermal scanning data improved.

• The neurospinal index improved after the procedures.

• The interviewed employees all reported improvement in their health status.

• The kinesitherapy and stretching in the vertical bath acted positively on the functional back status and the general health status of the employees. The positive effect of the procedures was long-term. The examination of the employees after one half year following the procedures proved this fact.

PP346
IATROGENESIS AS CAUSE OF SPINAL DEFORMITIES

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Introduction Deviations of the spinal structure affect the anatomy, mobility and symmetry of the trunk. Consequently, they can modify the movement and lead to deficits in postural control. This can be caused by several modifications to either the bone, muscular or neurological level.
Purpose The authors present a case of iatrogenic hyperkyphosis and scoliosis in a 12-year-old girl
Methods A 12-year-old girl with iatrogenic hyperkyphosis and scoliosis secondary to surgical treatment of a dorsal myelomeningocele was evaluated in Physical Medicine and Rehabilitation outpatient.
Results She presented with a progressive paraparesis, whose investigation revealed a dorsal myelomeningocele which was submitted to surgical treatment on 13/April/2015. The surgery took place without immediate complications and had a favorable outcome with good neurological recovery, but ultimately, she developed a hyperkyphosis and scoliosis objectified by clinical examination and extra long spine x-ray (left convexity scoliosis, lordosis and hyperkyphosis). Physical examination: weight of 54kg; height of 1.54kg (menarche in August/2014). With reducible hyperkyphosis in "cat's position" and "Sphinx's position"; and hyperlordosis. No changes in range of motion. No motor or sensory abnormalities. Independent gait.
Discussion and conclusions The authors want to draw attention to spinal deformities, which can be iatrogenic, and highlight the need for an early diagnosis and treatment which should be started as soon as possible to avoid permanent sequelae and the need for a surgical approach.

PP347
THE RELATIONSHIP BETWEEN LOWER BACK PAIN AND TRUNK MUSCLES STRENGTH AND ENDURANCE IN CHILDREN AGED 15 TO 17 YEARS

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Introduction. Chronic lower back pain is a common problem in musculoskeletal diseases. Back pain is fairly prevalent in healthy children and adolescents. Isokinetic testing is effective way to measure strength and endurance of trunk muscles.
Purpose.To identify relationship between lower back pain and strength and endurance of back and abdominal muscles in children aged 15 to 17 years.
Methods. The study was performed in Vilnius, Lithuania, 2014 - 2015. The study involved 28 children aged 15 to 17 years (53.7 % males and 46.3 % females). Participants were divided into two equal groups (n=14): children with lower back pain and children without lower back pain. Visual Analogue Scale for pain intensity (VAS-Pain) was used to examine lower back pain level. Both groups were assessed using S. McGill method and Isokinetic dynamometer (Biodex pro4). Chi-square test was used and the significance level $p \leq 0.05$ was considered as statistically significant.
Results. Back and abdominal muscles strength testing using isokinetic dynamometer with 60°/s angular speed showed statistically significant difference ($p<0.05$) between two groups. Testing with 180°/s angular speed showed statistically significant differences ($p<0.05$) only in abdominal muscles strength between two groups. The results of static abdominal muscles' endurance measurement using S.McGill method were statistically significantly greater in children without lower back pain. The study revealed that there is negative medium correlation between VAS pain scale and abdominal muscles strength (testing with 60°/s angular speed), and positive medium correlation between VAS pain scale and abdominal muscles endurance (assessed with S. McGill method) results.
Discussion and conclusions. Study showed that there is relationship between higher strength and endurance testing results and lower pain level. Children without lower back pain tend to have stronger trunk muscles.

PP348
THE OUTCOME OF TREATMENT OF PATIENTS WITH ONE LEVEL LUMBAR DISCECTOMY - THREE MONTHS FOLLOW UP

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Introduction: Almost 80% of people, at least once in life, has back pain with or without leg pain. Lumbar disc herniation is in 95% of cases cause of lumbar radiculopathy. In about 10% of these patients there are indications for surgical treatment.
Purpose: Determine the effect of one level discectomy, and rehabilitation, on activities of daily living through Oswestry Disability Index.
Method: Prospective clinical study included 50 patients with lumbar discectomy, operated in Clinic for Neurosurgery. We used ODI, witch the patients filled before, one month and three months after operation. All patients were included in early rehabilitation treatment of the algorithm of Clinic for PMR Clinical Center of Serbia. All 50 patients were in rehabilitation in stationar institution specializes in rehabilitation, duration of 21 days,one month after operation.
Results: 24 (48%) patients were women, and 26 (52%) were male. Average were 41,4 years old. Average ODI were 54,2% before, 28,9% one month, and 16,3% (minimum disability), three months after operation and secondary rehabilitation. There is statistically significant difference between data collected in preoperative period and on first checkup, and also between data collected on first and second checkup. 82%patients had improvement on last checkup compared to preoperative condition. In 8% patients ODI remained unchanged at the last measurement in relation to the preoperative, while in 10% noted deterioration and increase in ODI of the last measurement in relation to the preoperative condition.
Conclusions: ODI showed good recovery of patients after lumbar discectomy in first three months. The main benefit of operation was the reduction of pain in most patients. Welldone surgical treatment, and timely measures of early and secondary rehabilitation lead to improvement in patients after lumbar discectomy three months follow up which is shown by ODI, the "gold standard" of low back functional outcome tools.

PP349
INFLUENCE OF THE TYPE OF OCCUPATION ON THE LUMBAR SPINE DEGENERATION IN MEN

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Introduction: Lumbar spine degeneration (LSD) may be affected by lifetime exposure of physical loading. Previous studies have investigated the influence of only certain types of occupations on LSD. The aim of this study was to investigate the influence of the type of occupation on the LSD in men using nationwide survey.
Methods: The data was obtained from the 2010 to 2013 Korea National Health and Nutrition Examination Surveys (KNHANES). Men with ≥ 50 years of age were enrolled. Types of lifetime occupation were divided into 4 occupational groups: White collar (WC) workers, pink collar (PC), blue-collar (BC) workers and agribusiness and low-leveled (AL) workers. Lumbar spine radiographs were evaluated according to modified version of Kellgren Lawrence grade. Univariate and multivariate logistic regression analysis were performed to examine the relationship between types of occupations and LSD, severe LSD, and low back pain (LBP).
Results: The types of occupations were associated with increased risk of LSD. When compared with WC workers, the risks of LSD increased in BC workers (OR 1.492, p=0.005) and AL workers (OR 2.539, p<0.001). The risk of severe LSD was similar to LSD. When compared with WC workers, the risks of severe LSD increased in BC workers (OR 1.734; 95% CI 0.78-1.98) and AL workers (OR 3.058; 95% CI 1.96-4.77). The risk of low back pain showed the tendency to increase in AL workers (OR 1.380; 95% CI 1.00-1.90) but the results were not as significant as LSD.
Discussion and conclusions: The results of our study showed lumbar spine degeneration (LSD) is influenced by the type of lifetime occupation. This may be due to difference of occupational physical loading and other environmental factors. Further study is needed to investigate the exact of causes of LSD and LBP.

PP350
EVOLUTION OF FEAR-AVOIDANCE BELIEFS IN PATIENTS WITH CHRONIC LOW BACK PAIN DURING A REHABILITATION PROGRAM

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Introduction: Patients with chronic low back pain need multidisciplinary support. Cognitive behavioural forms of interventions seem usefull in addition to physical treatment since fear avoidance beliefs could be responsible for chronification of pain.
Purpose: The purpose was to study the evolution of fear avoidance belief in patients with chronic low back pain during a two-week rehabilitation program including exercise retraining, occupational therapy...
Methods: A longitudinal study was lead between november 2012 and mars 2014 concerning patients with chronic low back pain admitting in a rehabilitation 2-week program. Data were collected in medical file including Fear Avoidance Belief Questionnaire (FABQ) 1 and 2, Quebec back pain disability scale, Dallas pain questionnaire, pain evaluation (Analogic visual scale), clinical parameters such as spinal and lower limbs flexilibility and muscular strengh. Univariate analysis were performed with Wilcoxon, Kruskal-Willis and Spearman tests.
Results: 39 files were analysed. Significant decrease of 4,26 points was noticed (-21%) in FABQ 2, non significant decrease of 2 points for FABQ 2 (-2%). Clinical parameters were all improved.Univariate analysis shows improvement in FABQ 1 in patients with high body mass index (BMI), low back pain during less than 5 years or work injury. On the contrary, FABQ 2 was improved in patients without work injury.Multivariate analysis shows worst FABQ 2 score in patients with low back pain appeared after work injury, and better FABQ 2 score at the end of the rehabilitation for patients with high BMI and physical workers.
Discussion ans conclusions: Intensive rehabiliation was associated with regression of wrong beliefs toward daily activities and fear avoidance and improvement of pain. Programs including cognitive behavioral cares seems to change significantly beliefs and fear avoidance comportment in only two weeks. These interesting results need to be confirmed in further study to see if they are sustainable.

PP351
EFFECTIVENESS OF DIFFERENT PHYSIOTHERAPY PROGRAMS IN LOW BACK PAIN MANAGEMENT

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The aim of a study: to evaluate effectiveness of physiotherapy program using suspension training system and physiotherapy program with exercise using physioballs in low back pain management.
Study methods. Sixty persons (n=60) with nonspecific back pain by block randomization method were divided into two groups. Subjects of the control group (n=30) used a physioball in physiotherapy program, experimental group subjects (n=30) used suspension training system. VAS test was used to evaluate pain intensity, the Oswestry disability index scale – functional disability level, McGill's test used for trunk muscles static endurance, balance error scale - static balance.
Results. Pain intensity changes in control and experimental groups were statistically significant 1,57 ± 0,86 and 1,49 ± 0,87 score ($p < 0,05$). However there was not significant difference between groups ($p>0,05$). Oswestry functional disability index in control group decreased by 6,50 ± 2,21 and in experimental group - 7,07 ± 2,29 score ($p < 0,05$). Pain intensity and disability in sex life statistically significant decreased in experimental group. Endurance of back and abdominal muscles statistically significantly increased in both groups after the treatment. Static balance has improved in both group, however persons in experimental group have made less errors than in control group ($p<0,05$).
Discussion and conclusions. Study results showed that physiotherapy programs using physioballs and suspension exercises could statistically significant improve persons with low back pain functional status and reduce the intensity of pain. However, the physiotherapy program with suspension training was more effective redusing pain intensity, sexual disability and static balance than physiotherapy program using physioballs during training.

PP352

EFFECTS OF PHYSIOTHERAPY WITHOUT EXERCISES ON PAIN, ACTIVITY AND QUALITY OF LIFE LEVELS IN PATIENTS WITH NON-SPECIFIC LOW BACK PAIN

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Introduction: Exercises are effective in reducing pain and improving functional status of patients with non-specific low back pain (LBP) however not every patient comply with the exercise program.
Purpose: To evaluate the effects of a passive physiotherapy program without exercises on pain severity, activity and quality of life levels in patients with non-specific LBP.
Methods: In this before-after, open trial, 40 patients with non-specific LBP received a passive physiotherapy program including hot pack (30 min), ultrasound (1.5w/cm^2, continuous mode, for 10 min) and TENS (30 min) to lumbar region, for 20 sessions, 5 days a week, for 4 weeks. Main outcome measures were pain severity (visual analogue scale (VAS)), activity level (Oswestry Disability Index (ODI) and quality of life (SF-36) that were performed twice, on the first day and the last day of the treatment program.
Results: Mean age was 35 years (20-55); mean duration of LBP was 8.7 months (3-24). Twenty seven of the study group was male. Education level was primary school in 38%. At the end of the treatment, VAS (6.4 to 3.4), ODI (43.3 to 26.8), SF-36 PCS (33.0 to 40.8) levels were improved significantly ($p<0.001$). Improvement in SF-36 MCS (43.6 to 45.7) levels was not statistically significant ($p<0.05$).
Discussion and conclusions: In our group of patients with non-specific LBP, a passive physiotherapy program without exercises was beneficial in terms of pain severity, activity and quality of life levels. Exercises should be encouraged however for those who cannot comply with the program passive physiotherapy can also be beneficial.

PP353
AN EDUCATIONAL COURSE FOR PATIENTS WITH BACK PAIN DURING INDOOR REHABILITATION: WHEN SHOULD IT BE REPEATED?

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Introduction Various forms of educational programs for back pain patients exist. Studies on long term outcome are scarce. Also, there are hardly any data on the patients`view.
Purpose To learn more about the necessity and the periods of time to repeat a back pain education program.
Methods Nine months (+/- 3 months) after a 3-week inpatient rehabilitation program a questionnaire was sent to the patients who completed the whole course of a standardized back pain education course (10 sessions of 90 minutes, by physiotherapist, medical doctor and/or psychologist, as part of the rehabilitation program). "When should such a course be repeated?"
Results Of 1440 patients who answered the questionnaire, 754 said it should be repeated "after one year", 599 "after two years"; 65 "after five years". 22 patients stated that it should not be repeated at all. 62% of the patients stated that they do specific exercises regularly for at least three times weekly.
Discussion From the patients view it is necessary to repeat a back pain educational programm at certain intervals, for the majority at least every second year.

PP354
SIMPLY WALKING INSIDE THE POOL IS AS EFFECTIVE AS THERAPEUTIC AQUATIC EXERCISES IN PATIENTS WITH LOW BACK PAIN: A RANDOMIZED CONTROLLED TRIAL

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Introduction There is evidence to suggest that therapeutic aquatic exercise is potentially beneficial to patients suffering from low back pain (LBP). To our clinical observations, simply walking inside the pool is as effective as therapeutic aquatic exercises in patients with chronic LBP.
Purpose: To compare the effects of therapeutic aquatic exercises and walking inside the pool on pain severity and activity levels of patients with chronic LBP due to intervertebral disc disease.
Methods: In this randomized controlled trial 34 patients with chronic LBP were allocated to an experimental (n=20) or a control group (n=14). Three patients from the experimental group and 1 patient from the control group could not finish the program so final analysis performed over 30 patients. Both groups received conventional physiotherapy program including 15 sessions of hot pack, ultrasound (6 min) and TENS (20 min) to lumbar region, 5 days a week, for 3 weeks. In addition to this physiotherapy program, control group (n=13) simply walked inside the pool for 20 minutes, whereas the experimental group (n=17) performed therapeutic aquatic exercises. Main outcome measures were pain severity (visual analogue scale) and activity level (Oswestry Disability Index) that performed on the first day and the last day of the treatment program.
Results: Both groups were similar in terms of baseline clinical characteristics. Pain severity and activity level improved significantly in both groups ($p<0.05$). Between-group difference of mean change score was not significant for the visual analogue scale (5.15 vs 4.24) and Oswestry Disability Index score (31.3 vs 29.4).
Discussion and conclusions: In our group of patients with chronic LBP, both therapeutic aquatic exercises and simply walking inside the pool in addition to a physiotherapy program were beneficial in terms of pain severity and activity level. Simply walking inside the pool is as effective as therapeutic aquatic exercises.

PP355
EVALUATION OF ANTERIOR-POSTERIOR SPINAL CURVATURES IN CHILDREN AND ADOLESCENTS WITH LOW-DEGREE SCOLIOSIS

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Introduction The presence of scoliosis may depend on many factors, one of them can be disorders in the spinal curvatures in the sagittal plane or the type of somatic build. Identification of the factors predisposing to lateral scoliosis can contribute to the introduction of early prophylactic.
Purpose To evaluate the anterior-posterior curvatures of the spine in children and adolescents with scoliosis up to 30 degrees depending on various factors.
Methods A total of 242 subjects aged 6-18 years were enrolled in the study, 110 boys (45%) and 132 girls (55%). The test group included 121 people, 55 boys (45%) and 66 girls (55%) with scoliosis ranging from 10 to 30 Cobb's angle. The control group of 121 people was randomly selected taking into account the inclusion criteria for 1000 examined subjects to match the test group for age and gender. The groups did not differ significantly as to height, weight and weight-growth indicators. Average: age: 11.27 years (± 2.85), weight: 42.59 kg (± 14.17), body height 149.12 cm (± 17.00), BMI: 18.64 (± 3 19). Gravitational inclinometer was used to evaluate the anterior-posterior curvatures. Statistical analysis was conducted by means of the following tests: t-student / Mann Whitney U-test, Wilcoxon, Pearson chi-square, Pearson / Spearman and two-way ANOVA.
Results No significant differences were found in the sagittal plane spinal curvatures and the incidence of postural defects and somatic body type between the group of children with first degree scoliosis and without it. There were significant differences ($p = 0.006$) between the groups in the DELTA angle - the inclination of the middle thoracic spine, this angle was significantly more frequently smaller in children without scoliosis.
Conclusions Presence of first degree scoliosis does not determine the shape of the anterior-posterior spinal curvatures and the incidence of the sagittal plane defects. Due to the high incidence of Dowger's hump in the studied population, further research should be conducted to explore the problem and find the reasons for its occurrence.

PP356
KINESIOLOGICAL DETERMINANTS IN POST-OPERATIVE MUSCULOSKELETAL MANUAL THERAPY IN PATIENTS AFTER SURGERY TREATMENT OF C2 FRACTURE

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Introduction Cervical spine is very susceptible to damage and loss of stability due to injuries and due to its extensive mobility and range of movement. Odontoid fracture is one of most dangerous for patient. Usually adequate stabilisation allowing fracture healing is of paramount importance.
Purpose The aim of the pilot research it was to evaluate posttraumatic dysfunctions and pain of cervical spine in patients after surgical treatment of C2 fractures.
Methods The study group consisted of 30 patients after C2 fracture who underwent surgery. Personal questionnaire, Neck Disability Index, kinesiophoby TAMPA scale - have been used. Patients ROM of cervical spine was tested in manual way and with aid of special diagnostic equipment MultiCervical Unit - MCU. Comparative group consisted of 30 healthy subjects.
Results It was found that those patients after surgery with less mobility of cervical spine had worse quality of life and function due to greater pain. Patients group had much worse kinematics of cervical spine in comparison to norms and comparative group. What appeared to be the most remarkable conclusion - despite of serious motor dysfunction only few patients after surgery had professional post-surgery ambulatory rehabilitation of operated cervical region, not even mention about manual therapy.
Conclusions The methods of surgical treatment determines post-operative range of motion and dysfunctions of cervical spine - so the therapist, especially manual therapist should always be familiar with details of the patients' surgery. Some surgical determinants of post surgical rehabilitation as some surgery techniques of stabilizations of the cervical spine will also be presented.

PP357
ASSESSMENT OF PAIN IN PATIENTS AFTER CERVICAL DISCECTOMY

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Introduction For many patients suffering from disc related neck pain, cervical discectomy is the last chance to relieve this main source of many others secondary symptoms.
Purpose The aim of this study was retrospective assessment of patients pain after cervical discectomy.
Methods There was performed a retrospective study with 50 patients. Test group include patients with cervical myelopathy and neck pain. Each patient were asked to register their pain in the arm and in the neck on a vertical visual analogue scale (VAS) as well as questionnaire concerned on conducted operation of spine. Range of motion measurement was performed.
Results Results of analysis VAS scale for arm and neck pain before an operation was reduced at follow-up examination in patients with myelopathy and neck pain.
Discussion and conclusions There was statistically significant difference on decrease neck pain after cervical discectomy in patients with myelopathy and neck pain. For more general conclusions regarding the population there is a need for continuous research.

PP358
EFFECT OF LASER THERAPY AND LASER ACUPUNCTURE IN LOW BACK PAIN

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Introduction: Low back pain is one of the most common degenerative rheumatic disease
Object: The purpose of the study is to compare the therapy with laser application on painful area and on acupunctural points on pain in patients with chronic low back pain
Patients and methods: 40(22 women and 18 man) aged 36-62 years were included and prospectively followed during treatment. Patients were randomly assigned in two groups: First with 22(12 women 10 man) second group with 18(10 woman 8 man) Both groups were comparable. Laser used in the study was valve length of 780Nm and power of 70 First group of patients was treated wish laser beam applied on painful areas with 70 mW frequency of 2500Hz 60 seconds and energy absorption of 2,1 J/cm_2 3 times a week in 10 consecutive doses .Second group were treated with laser applied on acupunctural points BL25 BL 23 GB 36 LI4 BL59 with frequency of 70 Hz power of 40 mW0,6 J/cm^2 energy absorption in 30 seconds 3 times a week with 10 consecutive doses. Evaluation off treatment in both groups are performed before and after the end of treatment statistically analyzed (Student T test Mann Whitney test)
Results: After the tenth therapy there has come to high statistical significant decrease the value Oswestry score in boths groups. Average value in the first group in the beginning was42,12±10,2 and after the therapy34,40±9,20($p<0,001$). Second group in the beginning was45,10±15,5 and after the therapy34,48±10,2. After comparing the efficacy of both therapies using the Mann Whitney test the effect of laser therapy applied on acupunctural points in second group has shown significant reduction Owestry recently(Mann Whitney $p<0,05$)
Conclusions: Analysis cleary shows positive impact of Laser therapy in pain relief and quality of life with better results on laser applications on acupunctural points during treatment.

PP359
LUMBOSACRAL TRANSITIONAL VERTEBRAE AND LOW BACK PAIN: A CASE REPORT

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Introduction: Lumbosacral transitional vertebra (LTV) are common congenital alterations. It is the fusion of the fifth lumbar vertebra with the sacrum (sacralization) or the appearance of a sixth lumbar vertebra by an absence of fusion with the sacrum (lumbarization). Its etiology is unknown. In 1917 Bertolotti described the relationship between lumbar pain and existence of LTV. Several articles affirm their relative to further disc degeneration, herniated disc and osteoarthritis of the facet affects, but is not totally concluded. Diagnosis is made using imaging tests (Radiography and Magnetic Resonance Imaging (MRI)). There is a method of classification (Castellvi et al, 1984) according to the degree of transition, based on the shape and direction of the transverse processes.
Purpose: We present a case report about patient with L5-S1 right radiculopathy who presents a LTV associated.
Case presentation: A 37 year old man that presented chronic low back pain with recurrent right sciatica crisis since 8 years. Three months before, presented a new right sciatalgia crisis that did not improve with oral drugs. At the physical examination presented a positive Lassegue and Braggart test, analgesia of L5-S1 right territory and a strength of 3/5 in first finger extensor. At the lumbosacral radiography was noticed a LTV type IV with signs of lumbarization. The MRI was confirmed the herniated disc of L5-S1 and the LTV.
Discussion and conclusions: After consulting the literature related with this process, it seems to be an association between low back pain and the presence of LTV. This association is most common in patients with type II and IV. It may be interesting to include in differential diagnosis of low back pain the presence of TLV, especially in patients with low back pain refractory to conservative treatment.

PP360
INTRADISCAL INJECTION: STATE OF THE ART

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Introduction: Intervertebral disk decompression techniques are minimally invasive outpatients procedures for the treatment of disk herniation where under imaging guidance and via a percutaneous approach, a needle is inserted in the nucleus pulposus of the disk. The usage of the intradiscal procedures is increasing in clinical practice for disk diseases and it can be applied in different fields. A unified method is necessary to ensure efficacy, safety, repeatability and reduced risks for the patient.
Purpose: Our study is a review of the literature that aims to a state of the art for the intradiscal injection techniques for the treatment of lumbar disc disease and to underline the similarities and differences between the various methods.
Methods: A PubMed based research of several clinical articles on intradiscal injection was conducted. A total of 318 articles were initially identified from the search terms and, of these, only 20 studies responded to our inclusion criteria. We reported the procedures mentioned in these studies and we then compared the data obtained. Furthermore other articles that refer to intradiscal procedures are mentioned.
Results: We concluded that there are some common elements that appear in the peri-, intra- and post-procedural phases while others are less common and depend on personal preference and experience.
Discussion and conclusions: A unified intradiscal procedure does not exist. Further comparative studies on the efficacy and the advantages of some methods compared to others are needed to standardize the technique.

PP361
PEROPERATIVE PERONEAL NERVE ELECTRICAL STIMULATION TO FINE TUNE SPLATT PROCEDURE

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Introduction After a central nervous system injury, spastic tibialis anterior muscle overactivity, hindering an inward tilt in the frontal plan of the paretic limbs' hindfoot , in preloading gait phase is a common finding. It is often associated with equinus foot. As a consequence patients have gait disturbances and walking barefoot is impossible. Rehabilitation treatment goals are biomechanical rebalance during gait, control spasticity background noise, enhance central motor command and promote balance. Strategies imply a rationale of physiotherapy, pharmacologic, orthotic and surgical procedures. Split Anterior Tibialis Tendon Transfer (SPLATT) either alone or combined with other surgical techniques is a common neuro-orthopedic procedure done to treat spastic varus hindfoot. Usually during SPLATT, surgeon is not able to assess the proper length and tension of the hemitendon, especially when other musculoskeletal problems coexist and also because patient is unable to cooperate under anesthesia.
Purpose Describe a simple method of simulating active tibialis anterior muscle contraction using peroneal nerve electrical stimulation during surgery in order to assist the surgeon to estimate the correct tension and length of the hemitendon.
Methods Stimulation of the peroneal nerve via electrodes applied to the skin is done and adjusted before full aseptic installation of the patient on the operating table. During surgery, just before definite anchoring of the hemi tendon on the cuboid bone, the nerve is stimulated to obtain active contraction of the anterior tibialis muscle at different intensities and duration. This can be done as many times as needed to help the surgeon determine the best compromise between lenth/tension and effective active dorsiflexion
Results This simple stratagem is feasible, safe and considered very helpful by the surgeon. We hope it would be routine during this procedure.

PP362
BILATERAL COMPLETE RUPTURE OF THE RECTUS FEMORIS MUSCLE IN A PATIENT WITH HEREDITARY SPASTIC PARAPLEGIA: ETIOLOGY

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Introduction We report a unique case of a bilateral complete disruption of the rectus femoris muscle after minimal trauma in a 55 year old male with hereditary spastic paraplegia. Pain was the main complaint, without significant increase in spasticity nor walking impairment. A conservative treatment resulted in resolution of the complaints.
Purpose Provide insight on the pathophysiology of the spastic muscle.
Methods Exploration of the literature and comparison with our clinical case.
Results Only three case reports have been published on muscle rupture in patients with spasticity (Carpentier et al. 2013, Chua et al. 2006, Patejdl et al. 2008). The most common site of strain of the rectus femoris muscle in sports is the distal musculotendinous junction, whereas in our case it concerned a rupture at the transition of the proximal and the distal half of the thigh. The difference in localization supports the idea that the increased resistance to stretch is not only a neurally mediated reflex stiffness, but also contains muscle alterations. The skeletal muscle changes secondary to spasticity are described by Foran et al.; spastic muscles seem to have a higher fiber stiffness and a more compliant extracellular matrix.
Discussion Trying to explain why our patient with only mild spasticity ruptured both his rectus femoris muscles, one could reason he had only mild neurally mediated reflex stiffness but did have more pronounced muscle structure alterations.
Conclusions This unique case of a bilateral complete muscle rupture with only mild spasticity can provide new insights on the pathophysiology of the spastic muscle. It suggests that chronicity, in addition to the degree of spasticity, might be a risk factor for muscle alteration leading to muscle rupture.

PP363

IMPACT OF INTEGRATED UPPER LIMB SPASTICITY MANAGEMENT INCLUDING BONT-A ON PATIENT-CENTRED GOAL ATTAINMENT: RATIONALE AND PROTOCOL FOR AN INTERNATIONAL, PROSPECTIVE, LONGITUDINAL COHORT STUDY (ULIS-III)

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Introduction: Upper limb spasticity (ULS) is a chronic neurological condition that is a common feature of stroke and traumatic brain injury. The efficacy of botulinum toxin A (BoNT-A) injections for reducing spasticity has been well-established; however, real-life functional and global health improvements have been difficult to evaluate. The Upper Limb International Spasticity (ULIS) programme is a series of international, observational studies to evaluate current clinical practice and the utility of BoNT-A in the management of ULS. ULIS-III aims to develop a common core dataset for prospective systematic recording of interventions and outcomes.
Purpose: To describe the rationale and protocol for ULIS-III.
Methods: ULIS-III is a 2-year study expected to enrol >1000 patients from 70 worldwide expert centres. The primary objective is to assess the longitudinal attainment of patient-centred, function-related goals after BoNT-A treatment (including repeated injection cycles) alongside integrated spasticity management used in real-life settings. The Upper Limb Spasticity Index, a system for recording goal attainment alongside standardised measures, will be implemented to evaluate patient-centred goal achievement. Additionally, ULIS-III will record concomitant therapies, health economic and quality-of-life data to assess the wider benefits of BoNT-A in the management of ULS.
Results: Study results will be reported in peer-reviewed journals and at key international meetings.
Discussion and conclusions: ULIS-III may validate a novel framework for evaluating patient-centred goal attainment and the broader benefits of repeated BoNT-A treatment in the real-life management of ULS. Recruitment began in January 2015 and is expected to reach 1000 subjects by July 2016.

PP364
PREGABALIN FOR MANAGEMENT OF SPASTICITY IN AN ADULT WITH CEREBRAL PALSY. A CASE REPORT

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Introduction. Pregabalin is being used increasingly for management of spasticity; although to date there are no reports on its use in cerebral palsy.
Purpose. To report a case of pregabalin as being as effective as intrathecal Baclofen in a young adult with cerebral palsy.
Method. Case report.
Results. A 21 year old man has a background of cerebral palsy with significant spasticity, with associated pain and difficulty with hygiene and personal care. At age 12 he had been commenced on intrathecal Baclofen via implanted pump. The daily dose had been steadily increased up to 1412 micrograms per day. He had also undergone 12 sets of botulinum injections. At age 18 he was commenced on Pregabalin, and a significant reduction in spasticity was noted. The dose of Pregabalin was titrated up to 150 mg per day. His intrathecal baclofen infusion rate was decreased by 10 to 15% per month and the pump eventually removed. His spasticity remained well controlled, with improvements in dystonia, pain and intelligibility of speech.
Discussion and conclusions. This is the first report comparing Pregabalin with intrathecal Baclofen for management of spasticity. Pregabalin may be a useful addition to managing spasticity in adults with cerebral palsy, although further controlled assessments are required to confirm this.

PP365
EFFECTS OF A TILT TABLE INTEGRATING FUNCTIONAL ELECTRICAL STIMULATION AND PASSIVE STEPPING ON SPASTICITY AFTER SPINAL CORD INJURY

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Introduction and Purpose: Tilt table training is a common part of rehabilitation after spinal cord injury (SCI). This study investigated whether tilt table integrating functional electrical stimulation and passive stepping showed a reduction in spasticity when compared to traditional tilt table training.
Methods: A single subject design with repeated measures was conducted in a spinal cord injury inpatient rehabilitation unit. After a one-week baseline including three measurements, the participant (male, 56 years), with a spinal cord injury level T9 (AIS A, sustained seven months earlier), underwent four weeks (three times per week) of integrated tilt table training (iTTT; ErigoPro, Hocoma AG, Switzerland), followed by four weeks (three times per week) of traditional tilt table training (tTTT). For measuring spasticity the Modified Ashworth Scale (MAS) was used before and after each training session. Before and 24 hours after each training session, the Penn Spasm Scale was collected.
Results: After four weeks of iTTT, mean MAS score decreased with at least one point for the left leg in three muscle groups (hip flexors and extensors and gastrocnemius) and for the right leg in two muscle groups (hip flexors and adductors). After four weeks of tTTT, mean MAS score decreased with a maximum of 0.54 for the left leg in one muscle group and 0.75 for the right leg in one muscle group. The results of the Penn Spasm Scale showed a small and similar decrease for mean self-reported frequency of spasticity. Mean self-reported severity of spasticity showed a slight increase after iTTT and slight decrease after tTTT.
Discussion and conclusions: Our study suggests a positive effect for iTTT and tTTT in terms of spasticity reduction. MAS scores decreased after both interventions, slightly more in favour of iTTT, warranting further exploration in larger studies.

PP366
INTRATHECAL BACLOFEN PUMP FOR IMPROVING SEVERE SPASTICITY FOLLOWING SPINAL CORD INJURY - CLINICAL CASE

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Introduction: Spasticity is a common complication of the spinal cord injury; nearly 67% of patients are affected. This causes pain and decreased functionality that compromises daily life activities. There are several therapeutic options depending on the type and severity of spasticity. The intrathecal baclofen pump is an excellent treatment option for severe spasticity (Modified Ashworth Scale ≥ 3), reducing common adverse effects with large oral dosages. The authors present a clinical case of a patient with incapacitating spasticity with functional improvement after intrathecal baclofen pump implantation.
Case report: A 20 yo woman with cervical spine injury sequelea for 2 years, admitted at an inpatient rehabilitation program, with neuro-motor status of tetraplegia C7 AIS B; global spasticity; Modified Ashworth Scale (MAS) 3 in lower limbs and 2 in upper limbs, Penn Spasm Frequency Scale (PSFS) 3, associated with physical and psychological discomfort and functional limitation including impartment of intermittent catheterization. She started a global rehabilitation program that includes spasticity treatment with oral baclofen up to 105mg/day and tizanidine 6mg/day with no satisfactory response. The implantation of an intrathecal baclofen pump was suggested. Prior to implantation, a positive baclofen response test was observed. The pump was filled with 500mcg/ml with an infusion speed of 80mcg/day, resulting in improving of spasticity (MAS 1), spasm (PSFS 1) and functionality (possibility of intermittent catheterization and less need for assistance). She maintains regular follow up with good performance.
Discussion and conclusions: Studies have demonstrated that intrathecal baclofen pump is an effective method to treat severe spasticity secondary to spinal cord injury. This clinical case shows spasticity improvement and decrease spasm frequency leading to better performance of daily life activities and quality of life. It´s important the association of several therapeutic interventions and the support of a multidisciplinary team for best outcomes.

PP367
HOW DO PEOPLE WITH SPASTICITY VIEW THEIR CARE? FINDINGS FROM AN INTERNATIONAL PATIENT SURVEY

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Introduction While it is accepted that spasticity impacts quality of life (QoL), there is little information regarding patients own perceptions of care.
Purpose To survey the views of people with spasticity regarding their condition and its management.
Methods Global Internet survey (April 2014-May 2015) of 29 multi-choice questions.
Results 281 patients (28 countries) with spasticity of various aetiologies responded. Respondents indicated that spasticity has broad impact on their daily-life: 72% reported worse QOL, 44% reported loss of independence and 44% reported depression. Most respondents (64%) were cared for by family members, of whom half had stopped/reduced working. Almost half (45%) reported dissatisfaction with the information provided at diagnosis; main reasons were 'not enough information' (67%) and 'technical terminology' (36%). Respondents had high treatment expectations; 63% expected to be free of muscle spasm, 41% to take care of themselves and 36% to return to a normal routine. However, 33% had not discussed these expectations with their physician. The most common treatments were physiotherapy (75%), botulinum neurotoxin (BoNT, 73%) and oral spasmolytic medications (57%). Of those treated with BoNT, 20% said they had not discussed the benefits and side-effects of treatment with their physician and 47% waited >1 year from spasticity onset to treatment. Of those not treated with BoNT, several access issues were identified: expensive for patient (13%) and provider (10%), travel inconvenience (4%) and lack of experienced injectors (4%).
Discussion and conclusions This survey emphasises the broad impact of spasticity and highlights gaps in the treatment pathway and patient-physician communication.

PP368
CORTICOSTEROID INJECTION SIDE EFFECTS

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Introduction: Lateral epicondylitis is the most common elbow disease and local corticosteroid injection is a treatment option.
Purpose: Highlight possible complications of corticosteroid injection.
Methods: Case report exposition and literature review.
Results: A woman presented to PRM consultation with soft tissue atrophy and skin depigmentation on lateral humeral epicondyle area secondary to local corticosteroid injection.
Discussions and conclusions: Although the incidence of complications is extremely low, local corticosteroid injection has complications such as bleeding, hypersensitivity reaction, in-fection, tendon rupture, soft tissue atrophy and hypopigmentation. These last two are relevant if injection is given at a superficial site. The risk of subcutaneous fat atrophy and hypopigmentation can be reduced using steroids with high solubility and low efficacy duration, and compressing the injection site with gauze as the needle is withdrawn to prevent steroid leakage along the needle track.

PP369
THE ROLE OF PHYSICAL THERAPY IN IMPROVING CLINICAL, FUNCTIONAL AND PAINFUL STATUS IN PATIENTS DIAGNOSED WITH ASEPTIC NECROSIS OF THE FEMORAL HEAD

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Introduction: Aseptic necrosis of the femoral head is a common cause of developing musculoskeletal disability in young adults that are active from a socio-professional standpoint. The disease makes it difficult to perform even daily activities, especially for people diagnosed in advanced stages.
Purpose: The purpose of our study is to establish the role that physical therapy has in improving clinical, functional and painful status in patients diagnosed with this condition.
Methods: We included in our prospective study, a total of 23 patients diagnosed with aseptic necrosis of the femoral head, 3rd evolutionary stage (Ficat and Arlet classification). Participants were divided into 2 groups - first group consisting of 11 patients, underwent a 6 months physical therapy program and received analgesic treatment when needed; the second group of 12 patients received only analgesics when needed, during the same timeframe. Patients were evaluated at enrolment, at the end of the study, with a 6 months follow-up exam after the study was completed. Clinical and algo-functional status was evaluated using "Get up and go" test and Lequesne index. To determine how patients perceive pain, a visual analogue scale was applied (VAS), pain tolerance of patients being objectified by using a digital algometer.
Results: Regarding the time evolution of the pain threshold, differences were observed when the group followed physical therapy, with significant increases between the first and the second assessment. We found relief of functional values obtained from tests used without identifying significant differences between the 2 groups.
Discussion: The results confirm the importance of physical therapy in improving the painful symptoms that condition the walking pattern and daily living activities as well as physical activities.
Conclusions: Physical therapy is an effective way in improving the clinical, functional and most important, the painful status in patients with aseptic necrosis of femoral head.

PP370
STIFF-PERSON SYNDROME

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Introduction and purpose: Stiff-Person Syndrome (SPS) is characterized by stiffness with concurrent painful muscle spasms. It usually begins in the axial muscles and extends to the proximal limb muscles. SPS is an autoimmune disorder with antibodies directed against glutamate decarboxylase (GAD), resulting in dysregulation of gamma-aminobutyric acid (GABA). The purpose of this case report is to highlight the importance of inpatient rehabilitation in its management.
Case description: A 54-year-old female presented with progressive functional decline and multiple neurologic symptoms including muscle stiffness that started in August 2011. She also reported dysphagia and decreased appetite with resultant weight loss, culminating in hospitalization in 2013. A para-neoplastic panel was positive for GAD65 at 2063nmol/L (NL is <0,02). The diagnosis of SPS was made. She was treated initially with steroids and diazepam with limited success. She was admitted to the hospital treatment with intravenous immunoglobulin (IVIG) with good results. In 2015, she had an exacerbation of symptoms, fell, and sustained a cervical vertebral fracture. She developed abnormalities of posture, balance, and ability to perform activities of daily living. She was admitted to the inpatient rehabilitation hospital for 14 days. Daily physical and occupational therapy included global retraining with relaxation and stretching exercises to reduce spasms, functional retraining with progressive gait training and transfers. The pharmacological management was changed to include a morning dose (2 mg) of tizanidine for stiffness. No other adjustments were made due to day somnolence.
Results: Significant improvements in Functional Independence Measure (FIM) scale were noted from 60 to 102, especially in self-care, sphincter control, and transfers. The "get up and go" test improved from 1,46mins on admission to 54 seconds on discharge for a 10 meter distance. No changes in muscular tone were observed.
Conclusions: Inpatient rehabilitation should be considered in the management of SPS.

PP371
ULNAR PALSY – A CASE REPORT

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Introduction: Ulnar nerve entrapments (UNE) are the second most commonly seen neuropathy of the upper extremities. Although the ulnar nerve is most commonly entrapped at the elbow, it can also be entrapped at the upper arm and forearm, especially at the wrist. Localizing the site of the lesion by electrodiagnostic studies often is very difficult. UNE usually occurs as a result of chronic mechanical compression, stretch and repeated trauma. Because most of the intrinsic hand muscles are ulnar innervated, weakness of these muscles leads to loss of dexterity and decreased grip and pinch strength. The most important signs of ulnar neuropathy are numbness of 4th and 5th digits, hypoesthesia of the medial palm, atrophy and paresthesia of ulnar nerve innervated hand muscles, flexion deformity of fingers and atrophy of both the hypothenar and thenar eminences.
Results: Man, 43 years old, violinist. Without relevant personal antecedents. Starts sensitivity decrease above the fifth finger and the fourth finger inner edge, progressing towards in the inner edge of the left hand. He also referred decreased muscle strength in the fourth and fifth fingers. Denies trauma, recent viral diseases, vaccines or drug abuse. The observation displays fifth finger of the left hand claw. Hypoesthesia in the fifth finger and inside of the fourth finger board. Ineffective forceps in the fourth and fifth fingers. Electromyography: focal lesion of the left ulnar nerve at the elbow, of moderate severity in acute phase. He began rehabilitation program, using a ulnar hand splint, diary treatments in physical medicine and rehabilitation service with electric stimulation, occupational therapy and physiotherapy, with a good response and a recuperation on the functionality of the hand.
Discussion and conclusions: Given the pathology and without an etiology specifies, can be speculate that his violinist profession has caused repetitive trauma to the ulnar nerve, being responsible for the pathology.

PP372
EFFECTIVENESS OF CORRECTIVE PATELLAR TAPING IN TREATMENT OF PATIENTS WITH PATELLOFEMORAL PAIN SYNDROME

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Introduction Patellofemoral pain syndrome is the most common origin of anterior knee pain in adults, with incidence of 25% in people. Patellar taping is suggested in treatment of patients with Patellofemoral pain (PFPS) through improving the patellar positioning. The effectiveness and clinical efficacy of patellar taping was not clear in treatment of these patients. Purpose The aim of this study was to investigate the effects of patellar taping on pain, quality of life and patellar alignments in patients with PFPS.
Methods A convenient sample of 15 PFPS patients aged between 20–50 years was recruited in this cross-sectional study. Corrective patellar taping according to McConnell method was applied by a skillful physiotherapist for 4 weeks. The taping was done three times in every week. The variables of pain intensity (by VAS), quality of life (by KOOS questionnaire) and patellar alignments including Patellofemoral Congruence Angle (PFCA), Lateral Patellofemoral Angle (LPFA) and Lateral Patellar Displacement (LPD) (by skyline radiographic measurements) have been evaluated in before and after the study period. Variables were statistically analyzed by Paired t-test and $P<0.05$ was considered for significance.
Results McConnell patellar taping for 4 weeks decreased significantly pain intensity (VAS) in patients with PFPS ($P<0.05$); however the quality of life score (KOOS questionnaire) and patellar alignments were not improved at the end of study period ($P>0.05$).
Discussion and conclusions Although McConnell patellar taping was helpful in pain reduction in patients with PFPS; but had not enough strength for improving the quality of life score (based on KOOS questionnaire) and patellar alignments. It appears that the final clinical judgment in regard of patellar taping is dependent on the type of impairments in initial evaluation.

PP373
THE COMPARISON WITH ISCHEMIC COMPRESSION AND DRY NEEDLING FOR MYOFASCIAL PAIN SYNDROME

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Introduction: Myofascial pain syndrome (MPS) is the most common in the musculoskeletal disease. Dry needling techniques and ischemic compression are the most common applications.
Purpose: We aimed to compare the efficacy of dry needling and ischemic compression methods on pain, cervical range of motion (ROM), and disability in MPS.
Methods: This is a randomized, placebo controlled study. 78 patients with MPS were randomly assigned into three groups. Group1 received dry needling (n=27), group 2(n=26) received ischemic compression and group 3(n=25) received combine with dry needling and ischemic compression inventions. Additionally, all patients were given neck exercise program including isotonic, isometric and stretching. The severity of the pain was measured by visual analog scale (VAS). The pressure pain threshold (PPT) and cervical ROM were also recorded. Disability was assessed by the Neck Pain Disability Scale. All assessments were performed before the treatment and one month and three months after the treatment.
Results: There were statistically significant improvements in VAS, PPT,cervical ROM, and disability scores after one and three months in all groups compared to pre-treatment results ($p<0.05$). After three months of follow-up, statistically significant differences were observed in all parameters between the groups ($p<0.05$) except cervical ROM ($p>0.05$).
Discussion: Myofascial pain syndrome in patients with ischemic compression and dry needling effective treatment methods are shown separately in our study to be more effective when used together.
Conclusions: Our study indicated that exercise associated dry needling injections and ischemic compression were effective in decrease of pain level in MPS as well as increase of cervical ROM and decrease of disability of individuals.

PP374
REHABILITATION PROGRAM FOR PATIENT WITH GRANULOMATOSIS WEGENER COMPLICATED WITH CRITICAL ILLNESS POLYNEUROPATHY AND MYOPATHY (CIP/CIM)

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Introduction A 19 year old woman diagnosed with Granulomatosis Wegener in a Rheumatology department four months ago, was admitted to our department. She had been also hospitalized for 25 days in an Intensive Care Unit for respiratory failure and infection due to pulmonary involvement of her main disease.
Case description At the admission, the patient was confined to bed and without sitting balance. She had a muscular strength up to 2/5 at lower limbs proximally and 0/5 distally. At upper limbs she had muscle strength from 1/5 to 2/5 with greater burden proximally. The EMG test sustained the diagnosis of CIP/CIM. She had need for constant oxygen supply, being insufficient to maintain her oxygen saturation over 90% without it. She exhibited widespread cutaneous lesions involving trunk and extremities and also a sacral pressure ulcer. She was being treated with antiosteoporotic medication and cortisone with decreasing dosage. The rehabilitation program included respiratory physiotherapy, upper and lower limbs strengthening exercises and balance retraining interventions. Ability to balance in the sitting position was reached 25 days later and she could stand between the parallel bars in 49 days. After 75 days she could walk independently using a walker, wearing two posterior leaf springs. Weaning of oxygen was gradual and it was reached fully in 84 days. Pressure ulcers were healed but skin continued to be sensitive with breakdown risk.
Discussion In the case of this patient, the rehabilitation program achieved its goals. She was discharged being independent in activities of daily life and capable to move inside and out of her home.
Conclusions The cooperation with the patient and her concentration on the program, the medical advice of the rheumatologists giving the appropriate medication, and the adequate adjustments of the rehabilitation program, substantially contributed to the success of the whole effort.

PP375
AN UNUSUAL CASE OF ATROPHIC PROFOUND LINEAR SCLERODERMIA IN A 3 YEARS OLD BOY AND THE REHABILITATION APPROACH

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Introduction: All forms of scleroderma are rare in childhood.[1] The most common form in childhood is localized scleroderma, which may take the form of morphea or linear scleroderma.[1]
Purpose: We present a case of linear scleroderma in a 3 year old child with muscle shortening and secondary limited ROM.
Methods: Case of a 3 years old boy, previously known for delayed psychomotor development, is assessed by rheumatology department because of indurated plaques present in right leg and the inability to perform certain daily activities autonomosly. Evaluation finds skin lesions in anterior of thigh, indurated and a waxy appearance. Evident atrophy in right leg with attitude of flexed right hip and flexed right knee of 20° with Thomas test + of 15° and Ely test + at 45° knee flexion. Slight dysmmetry favoring left leg by 1 cm. Right popliteal angles 60° and left popliteal angle 30°. Ankle dorsiflexion with knee flexion 10° and with knee extension 0°. Anterior and posterior bipodal jump present with asymmetry of movement of right leg. Inability of one foot stand on right leg, inability of toe stand on right leg. Gait pattern presents initial full foot contact and flexed hip and knee during stance in right leg. Skin biopsy reveals linear sclerodermia on lower right extremity with deep muscle involvement. Patient begins physical therapy aimed to recover ROM, stretching musculature and reeducation of gait concomitant to corticotherapy and methotrexate prescribed by rheumatologist.
Conclusions: This case aims to familiarize the rehabilitation physician with an uncommon dermatologic disease in children. This etiology involves musculoskeletal progressive deterioration if not treated promptly and directly hampers the psychomotor development of children. Physical therapy is important with positive results.

PP376
A CLAY SHOVELERS' FRACTURE PRESENTED AS AN AGE RELATED SPORTS INJURY

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Introduction A recreational adult golf player and an elite adolescent soccer player were seen at our service with a history of a cervicodorsal strain with a prolonged healing time related to sports activity.
Purpose After work up both persons were diagnosed with a fracture of the processus spinosus of T1. In the adult the fracture was located in the body of the processus spinosus, while in the adolescent it was located in the tip of the processus. The soccerplayer resumed his sportsactivities after 3 months. The golfplayer was unable to play golf after 4 months.
Methods A literature survey was done looking for similar cases.
Results Formerly Clay Shoveler's fractures were mainly related to specific (heavy) manual professional activities. Nowadays similar cases have been described in relation to mainly "upper extremity" sports. Diagnostic work up can be done by X-ray, bone scintigraphy, CT scan and MRI. Discussion The location of Clay Shoveler's fractures are age specific. In the adolescent the apophysis at the tip of the processus is the most vulnerable site for injury. The clinical presentation is not age specific, nor is the treatment which is symptomatic for both age groups: analgesics, muscle relaxants, local physical therapy and sports restriction. Though bony healing is not always the case, this is of no importance, as most persons can resume sports activity pain free after some months.
Conclusions Clay Shoveler's fractures should be taken into account in the differential diagnosis of sports related less than minor cervicodorsal strains.

PP377
MUSCLE TONE ASSESSMENT FOR MONITORING MUSCLE TRAINING

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Introduction and purpose: The aim of this paper is to present the role of myotonometry in assessment muscle viscoelasticity by measurement of force index (IF) and stiffness (S).
Methods: The method is based on muscle response after mechanic impulse on the muscle group(1). We present the study for 2 lots (1 experimental lot, 2 sample lot)age 16years, each 12 persons. Comparassion between two lots help us to build the muscle training The best muscle tonus is considered when the proprieties are analogue for both sides. The muscle groups studied: rectus femoris (RF), biceps femoris (BF).
Results: Assessment help us to see that average values for S at BF are more then literature 229,49+/- 22,38 (relax) and 363,53+/-86,77 (contraction), and difference the same average like other authors,134,04.For RF for S, high values that can be compare with literature 219,20,43+/-(relax) , 299,79+/-54,52 (contraction).
Discussion and conclusions: The difference between contraction and relax are in according with the most dates from literature, 80,73. IF has the same of evolution for both muscle. Also exist a asimmetry between right and left side for S, because of predominance the right side. Our research can be explain by the cortex engrame but also by the importance of a specific training for restore the functional simmetry.Exploring the muscle tonus focused on elasticity and force index allow choice the best way for muscle training and our results show that the training is focused on increase muscle power.

PP378
APPLICATION OF REHABILITATION SPORTS PROGRAM IN PEOPLE WITH STROKE

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Introduction Participating in rehabilitation sports after stroke may positively influence health-related fitness including muscle strength and cardiorespiratory endurance. During the last decades, the importance of health-related fitness has been recognized for functional recovery in people with stroke. Rehabilitation sports are regarded as the continuous and spontaneous physical activity that can help to improve physical, psychological, and social ability. Especially, it is focused on recovery of physical fitness and return to normal social life.
Purpose The objective of this study was to investigate the effect of rehabilitation sports program on health-related fitness such as muscle strength and cardiorespiratory endurance in people with stroke.
Methods Participants with stroke were recruited from rehabilitation center and community stroke clubs in Seoul, Republic of Korea. Subjects were randomly assigned into exercise or control group. Exercise group participated in 8 weeks of 1-hour session for 3 days per week. This combined rehabilitation sports program consisted of a warm-up for ten minutes, a main exercise for forty minutes (circuit training, new sports game), and a cool down period for ten minutes. Subjects in the Control group were asked to continue their routine daily activities. Muscle strength and cardiorespiratory endurance were assessed by HUR and COSMED.
Results The results represented significant increases in muscle strength and cardiorespiratory endurance. Primary outcome measures were isometric muscle strength (leg extension, flexion, abdominal, back) and cardiorespiratory endurance (VO_2peak).
Discussion and conclusions Our study showed that 8 weeks of Rehabilitations sport program might be an efficient intervention method to improve health-related fitness such as muscle strength and cardiorespiratory endurance in people with stroke. Acknowledgement This research was supported by a grant (#15-C-01) by National Rehabilitation Center Research Institute.

PP380
THE INFLUENCE OF DIFFERENT TRAINING PROGRAMS ON WOMEN'S MUSCLE FUNCTIONAL STATUS

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Introduction The muscle strength and endurance asymmetry of lower limbs may determine posture and walk disorders, increase the risk of degenerative changes and musculoskeletal traumas. Women's absolute strength in various muscular groups starts to decrease earlier and is less than men's during all life stages. It is important to choose an effective training program to help women restore muscle functional status.
Purpose To evaluate the effectiveness of different training programs on the strength and endurance of women knee flexors and extensors.
Methods The research included 50 healthy women (mean age 20.56±1.40 y). They were randomly divided into two groups. 3 months, twice a week the first group (n=25) performed traditional muscle strength exercises (open kinetic chain exercises), the second group (n=25) performed isokinetic training program to improve their knee flexors' and extensors' functional status. Muscles were evaluated using isokinetic dynamometer at 60, 90, 180°/s angular speed at the beginning and the end of the training program.
Results In the second group of the studied after isokinetic training program knee flexors' and extensors' strength improved in 16.64 % in non-dominating leg and 18.50% in dominating leg ($p<0.05$). After traditional strength exercises program of the first group women, there was 9 % increase of dominating leg muscle strength ($p<0.05$). Isokinetic training also improved knee flexors' and extensors' endurance: in non-dominating leg 39.77 %, in dominating leg – 33.52% ($p<0.05$). The dominating leg's muscle endurance of the first group women improved in 9.50% ($p<0.05$).
Discussion and conclusions To summarize the findings, it can be said that isokinetic training was more effective than traditional strength exercising program. Women knee flexors' and extensors' strength improved more than 16 % and endurance improved more than 30%.

PP381
FACTORS AFFECTING ON RANGE OF MOTION OF LOWER EXTREMITY IN NORMAL YOUNG ADULTS - PUSHING FORCE, GENDER, BODY MASS INDEX, INSTITUTE AND SERIAL STRETCHING

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Introduction and purpose To investigate the effect of pushing force, gender, body mass index (BMI), Institute and serial stretching on range of motion of lower extremity.
Methods Range of motion (ROM) of knee flexion at prone position and ankle dorsiflexion (DF) and plantar flexion (PF) at neural knee position of supine position were measured according to change of pushing force (0 kg, 1 kg, 3 kg, 5 kg, 7 kg) 10 times with each method for normal Korean 244 healthy adults (mean age 30 ± 7 years, men 123, women 121). ROM, pushing force and BMI were measured by digital Inclinometers and muscle tester. Subjects with any factors affecting ROM of lower extremities, previous trauma and disease of leg, radiologic abnormalities and serological inflammatory sign, were excluded. Three different hospitals joined in this study and evaluated ROM of knee and ankle joint by same methods.
Results ROM of knee flexion was 121.9° on 0 kg, 125.9° on 1 kg, 130.5° on 3 kg, 134.3° on 5 kg and 136.6° on 7 kg at prone position for 10 times with each method. ROM of ankle DF was 16.6° on 0kg, 19.2° on 1 kg, 22.1° on 3 kg, 24.5° on 5 kg, 26.4° on 7 kg and ROM of PF was 49.5° on 0 kg, 53.0° on 1 kg, 56.2° on 3kg, 59.1° on 5 kg, 61.4° on 7 kg at supine position. The more pushing force leads the more range of motion at knee flexion, ankle DF and ankle PF ($P<0.001$). Change of ROM according to increasing number of measurement was not statistically significant. ROM of ankle PF for female estimated greater than male regardless of the pushing force and the number of measurement ($P<0.05$). The greater BMI leads to the lower value of ROM for knee flexion ($P<0.001$), but not for ankle DF and PF. Significant differences($P<0.05$) were observed between each institute even after thorough and four hours-education for resident of rehabiliation medicine.
Discussion and conclusions Passive range of motion is critical for the disability evaluation of joint disease and trauma in Korea. Pushing force, BMI, gender and also examiner should be consider for the routine ROM evaluation. Standardized protocol and well trained examiner is essential to provide a reliable data of range of motion.

PP382
HANDLING RELUCTANCE OF PHYSICAL EDUCATION TEACHERS IN DEALING WITH SPORTS INJURIES IN ALBAHA SCHOOLS AND TEACHERS TRAINING ON REHABILITATING INJURIES

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Introduction: Not only, is the problem for many sports teachers that health emergency aid and rehabilitation of injuries during classes raises concern and feeling of helplessness, but also knowing the existence of untrained teachers to provide first aid in schools is likely to aggravate injuries and errors occurring when dealing with dangerous situations. All teachers must be able to deal, not only with traditional health emergency, but also with emergency most frequent and complex health issues. Through the focus of international research trends on the problem even in the advanced countries, and the continuous communication between researchers and physical education teachers in the Saudi government schools during several training events, there is a confusion or weak information in this area. This situation hinders teachers from providing appropriate first aid during risky situation, especially because teachers do not receive continuous in-service training for refining their skills in this area. Therefore, this study addresses this problem to know the dimensions and propose appropriate intervention training to achieve its objectives.
Purpose: Evaluate the effectiveness of the intervention training on the level of teachers' knowledge and attitude to practice basic first aid for sports injuries at school.
Methods: Firstly, we assess the current level of physical education teachers using a questionnaire, and secondly implementing a training intervention comprising 18 variety of training modules of first aid training. Finally we applied the Post- assessment questionnaire.
Results: The proposed intervention training program impacted positively on the rehabilitation of reluctance of physical education teachers in dealing with sports injury by improving the level of teachers' knowledge and attitude to practice basic first aid for sports injuries at school.
Discussion and conclusions: It is recommended that intervention to physical education teachers in first aid and rehabilitation should be a standard component pre-service or in-service.

PP383
BARRIERS TO AND POSSIBILITIES OF RETURNING TO PLAY AFTER A SEVERE SOCCER INJURY - A QUALITATIVE STUDY

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Introduction Soccer is the biggest sport in the world and has shown positive effects on human health witch can also results in a large number of injuries. Many soccer players are today physically ready to return to play, but not mentally. A soccer injury is defined as follows; an injury as a result of soccer that lead to the player fully or partially unable to participate in training and matches.
Purpose to investigate whether there are psychological factors of the injured soccer player who returns to the sport and who stop playing after a severe injury.
Methods The study was conducted using a qualitative approach. The material was analysed by latent content analysis. Eight soccer players, four boys and four girls, aged 14 to 25 years were interviewed individually. The participants were included in the study if they have been active alternative formerly active soccer player at the time of injury and was injured during a match or training. All soccer players who participated in the study suffered a severe soccer injury that had resulted in absence from training/match for at lest 28 days, classified as a major injury.
Results The participants reported on various psychological aspects that affected them both positively and negatively during the rehabilitation period. Individual factors were injured reaction, motivation and fear, but also an inner pressure. Situational factors about their coach, the team, the family and the physiotherapist's influence the informants.
Discussion and conclusions Several psychological factors affect a young soccer player's rehabilitation after a severe injury. However these factors do not differ between those who are now active and those who stop playing. The findings in this study was that the support from the team and the coach is something that is often lacking in a soccer player's rehabilitation.



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