Symposium Mammographicum 2016

in partnership with the Association of Breast Clinicians and NHS BSP Update on Physics of Digital Mammography

3–5 July 2016

ACC Liverpool

ABSTRACT BOOK
Oral abstracts

14.10 – 15.15

4.2 Recall rate and reader confidence in the prevalent screening round: Is there an improvement after the addition of tomosynthesis to conventional mammography?

Dr Neil Upadhyay, Dr Neil Sonjeji, Dr Victoria Stewart, Dr Nigel Barrett, Dr Stella Comitis, Dr Sylvie Flais, Dr Angela Gupta, Dr Hema Purushothaman, Dr Keshthra Satchithananda, Dr Neelofar Zaman

*West London Breast Screening Service, Imperial College Healthcare NHS Trust, UK; *South East London Breast Screening Service, King’s College Hospital NHS Foundation Trust, UK

**Purpose:** To determine whether 3D tomosynthesis in addition to standard 2D screening mammography reduces single reader recall rate in women undergoing their first screening examination.

**Methods:** Regional ethics committee approval was obtained. 981 women undergoing first or prevalent round screen within the NHS Breast Screening Programme (NHSBSP) were recruited following informed consent, for additional 3D tomosynthesis examination (Selenia Dimensions, Hologic). The age range of patients was 47-51.

Recruited patients were divided into eight groups. One of eight experienced mammography screen readers read the standard 2D examination of patients within their allocated group, and after a four week interval, the 2D examination with the 3D tomosynthesis study for same patient. The reader made a decision on patient recall to further assessment at each sitting along with a confidence rating on their decision using a Likert scale. The recall rate and confidence ratings following evaluation of the 2D examinations were compared with the recall rate and confidence ratings following evaluation of both 2D and 3D examinations.

**Results:** After only 2D examination 17.1% of patients were recalled. For the 2D examination with 3D tomosynthesis 10.9% of the patients were recalled. The difference between the two groups was significant (p<0.001). Median confidence on the Likert scale was 7 for 2D examination and 8 for 2D and 3D together (p=0.001).

Conclusions: Addition of 3D tomosynthesis significantly reduces recall rate at first screen, with a modest associated increase in reader confidence and therefore could play an important future role in the NHSBSP.

4.3 The Changing Case Order to Optimise Patterns of Performance in Screening (CO-OPS) trial

Dr Sian Taylor-Phillips, Dr Matthew Wallis, Dr Alison Duncan, Ms Olive Kearins, Professor Aileen Clarke

University of Warwick, UK

**Background:** A vigilance decrement of decreasing sensitivity to detect visual targets with time on task has been observed in many repetitive visual tasks. [1,2] We investigated whether there is a vigilance decrement in the repetitive visual task of mammography film-reading, and whether reversing the case order for the second film-reader can reverse such a decrement.

**Methods:** A randomised controlled trial was conducted in English breast screening centres. [3] Batches of women’s mammograms were randomised to be read in the same order by both film readers, or in the opposite order (i.e. one examining the batch backwards). Differences in cancer detection rate, recall rate and rate of disagreements between intervention and control arms were investigated using multi-level logistic regression analyses. Patterns of cancer detection rate and recall rate with time on task were analysed by including position in batch to the models. Analysis of patterns of film-reader performance over a longer time period will be achieved by examining patterns when several batches are read in one reading session.

**Results:** 46 centres participated in the trial, each centre implemented the randomisation and intervention automatically through a change to the National Breast Screening Service (NBSS) software. 1,207,633 women were randomised to intervention or control group over a one year period at each centre. Results were collected from routine records, after annual reporting.
were proven by histology or >2 year follow-up. 230 cases were available for analysis. Eight accredited UK NHBSP readers, blinded to assessment outcome, retrospectively read all cases with A: screening mammograms plus DBT, and B: screening mammograms plus SSM. Readings were 9 weeks apart to avoid recall bias. Reading condition order was reversed in half the readers. Statistical analysis included ROC curves, compared by Chi Squared test.

Results: Based on the area under the ROC curve, the two methods are not significantly different (aROC 0.87 for DBT vs 0.86 for SSM, p=0.49). DBT specificity was not significantly different from SSM sensitivity (90% vs 86%, p=0.10) whereas DBT specificity was significantly lower than SSM (59% vs 64%, p=0.0002).

Conclusions: Overall, Siemens DBT is as accurate as standard supplementary mammography for assessing screen-detected, soft-tissue, mammographic abnormalities. It is therefore suitable for optional implementation subject to practical evaluation. The accuracy of DBT in this study was driven by higher sensitivity compared with SSM, while specificity was lower.

References:
Cancer Invest/Treatment. doi:10.1016/j. radi.2015.07.004

11.65% HEIs sent students on mammography placements, 2(12%) sent females only. Range 2 days-2 weeks. Influences included availability of expert teaching and relationship with clinical departments. Positive engagement appeared to encourage students into mammography posts

Conclusion: Variation in undergraduate exposure to mammography appears to influence student perception of the specialty. Students views should be sought to add validity to these findings

8b.2 Preoperative role of Contrast Enhanced Mammography (CESM) in Breast Cancer

Dr Mohamad Hajaj, Dr Sana Pascaline, Mrs Katalina Horvath
Kettering General Hospital, UK

Background: Currently complex breast cancer cases are evaluated by MRI.

MRI has high sensitivity but also has high cost, long waiting time, claustrophobia and some false positivity issues.

CESM offers combined high quality digital mammograms and contrast enhanced image similar to MRI performance for diagnosis and staging of breast cancer (Fallenberg at el 2014.). The purpose of this study was to establish the sensitivity of CESM.


47 patients underwent CESM, 25 also had Breast MRI. Inclusion criteria for CESM were P4/5 finding and age 40-70 years. Exclusion criteria were diabetes, nephropathy, allergy to contrast. CESM two-view images were obtained 2 minutes after the intravenous application of iodinated contrast.

Results: 47 histopathological results were compared to CESM predicted size.

The combined CESM average lesion size – 26.2mm, histopathological – 25.1mm. One false positive and one false negative CESM result.

CESM provides faster, cheaper and a comfortable experience for the patient.

References:

8b.3 Changes in enhancing tumour volumes on magnetic resonance imaging in patients undergoing neoadjuvant chemotherapy for primary breast cancer – correlation with final pathological score

Dr Shelley Waugh1, Dr Nazleen Muhammad Gowdh1, Dr Sarah Vinnicombe1
1. Ninewells Hospital, NHS Tayside, UK; 2. Aberdeen Royal Infirmary, NHS Grampian, UK

Purpose: Dynamic contrast enhanced (DCE) Magnetic Resonance Imaging (MRI) is widely utilised in monitoring neoadjuvant chemotherapy (NAC) for primary breast cancer. In the drive for personalised treatment, imaging metrics that can identify patients unlikely to respond to treatment are key to allow treatment change or surgical intervention. We sought to link changes in enhancing tumour volume (ETV) between baseline and interim MRI with pathological outcome, assessed using the residual cancer burden (RCB) score.

Methods: 103 patients undergoing NAC for biopsy proven breast cancer underwent baseline (pre-NAC) and interim (after 2 or 3 cycles) MRI on a 1.5 Tesla (T) or 3.0T scanner with DCE imaging using a T1 weighted 3D acquisition. ETV was analysed using the active contour segmentation tool in ITK-Snap2. ETV at both time-points was calculated twice by one observer, blinded to pathology and with a one-month interval between analyses.

Repeatability of ETV as 1.5ml (1.1% percentage difference between visits).

Conclusions: These results demonstrate that percentage change in ETV correlates with RCB score. Good IOR indicates that this is a potentially useful clinical tool in prognostication.

References:

8b A completed audit of detailed axialle ultrasound scan in re-staging of the axilla after neoadjuvant chemotherapy

Ms Anastasia Poppe, Mr Panos Pappas
Mr Mohammad Tahir, Dr Claire Kayser, Miss Nicola Roche, Mr Gerald Gui, Miss Fiona MacNeill, Mr Peter Barry, Dr Robert Wilson, Miss Jennifer Rusby
The Royal Marsden Hospital NHS Foundation Trust, UK

Introduction: With a more conservative approach to axillary surgery being considered after NACT, clinical re-staging becomes important in decision-making.

Methods: Data were collected on 460 patients who had proven axillary disease prior to NACT and underwent axillary lymph node dissection between January 2006 and December 2015. Patients were grouped according to whether axillary Ultrasound Scan (aUSS) was...
undertaken before or after December 2012 when we started to document auxiliary response in detail. Post-chemotherapy aUSS reports and auxiliary pathology reports were classified as positive or negative for abnormal lymph nodes and for residual disease (pCR) respectively.

**Results:** The specificity of aUSS before and after the change of practice was 55% and 71% respectively. The specificity was 59% and 85% respectively. Negative predictive value (NPV) increased from 38% to 83%.

**Conclusions:** The high NPV makes aUSS a useful tool in re-staging of the axilla as part of treatment planning following NACT. Patients with aUSS negative axilla are likely to have a lower false negative rate of SLNB after NACT (Boughey et al). However, aUSS does not replace the need to identify and biopsy the nodes which were proven to be positive prior to NACT.

**References:**

### Symposium Mammographicum Conference 2016

**Poster abstracts**

#### P1 Pathology and Positioning in mammography

**Mrs Juliet Mazara**

**NHS Birmingham, UK**

**Content:** To demonstrate the importance of correct positioning techniques in mammography towards the diagnosis of breast pathology. To remind the breast imaging reporters of the importance of image quality when reporting mammographic images.

**Introduction:** Mammographic image quality can influence cancer detection rates and stage of detection (Yamaguchi et al 2010). Taplin et al (2002) demonstrated that poor positioning was the main reason for low cancer detection rate and that the overall quality was also associated with increased interval cancers when cases of ductal carcinoma in situ were included. Achieving high quality mammograms may improve sensitivity and possibly reduce the false positive rate (Guertin et al 2014). Clinical images must meet the radiologists needs in order to serve the patient well (Cheeseman 2006). Factors affecting the clinical image quality of a mammogram are positioning of the breast, compression, sharpness, optimum exposure and contrast (Popli et al 2014). The mammographer must have advanced positioning and clinical skills to ensure that the area of concern is appropriately imaged, clearly seen and able to be characterized by the radiologist because what is missed or obscured on clinical images is not analyzed by the radiologist (Cheeseman 2006). A good quality mammogram demonstrates all the breast tissue with maximum image detail.

**References:**
of breast tissue by the implant. This means that potential abnormalities can be missed on standard mammography.

In March 2015, following recommendations of a national audit within the National Health Service Breast Screening Programme (NHSBSP), we changed our local protocols to include an Implant Displacement Cranio-Caudal (CC) view historically known as the Elklund technique CC) for women presenting for mammography with breast augmentation.

This was implemented in both the screening and symptomatic services. Where the displacement view is not possible due to the implant being immobile we take a true lateral view instead.

In our experience, in most cases, the images using the displacement technique demonstrate more of the anterior breast tissue than a standard CC view.

We present a pictorial review of six cases where the implant displacement view has demonstrated breast abnormalities otherwise obscured, or only partially imaged, on the standard mammographic views.

To conclude, our impression is that the implant displacement view is a useful technique for demonstrating abnormalities in the augmented breast.

**P3 Quantitative review of Cranio-caudal (CC) images**

**Ms Sarah Dunn, St Vincent Breast Screening, UK**

**Purpose:** To review the quality of 25 CC images produced by every mammographer within St. Vincent’s Breast Screen, part of Breast Screen Victoria. This review may highlight areas to improve the quality of these images. The CC image can often be overlooked as it is seen as the easier image to produce and less time and effort may be put into the production of this image. This study will investigate the quality of CC images at this service and potentially identify training needs.

**Method:** By using a comprehensive review system, 25 images from each mammographer currently screening regularly within the service are being assessed. These images are being reviewed with any common defects in the images being noted e.g.

- Areas such as tissue thickness
- Pectoral muscle to nipple distance measured (PNL)
- Image bias
- Nipple in profile

A summary of the findings will be presented at the second quarter Continuing Education Meeting (CEM) in May 2016.

**Results:** As this research is still being undertaken, there are no results so far.

**Conclusion:** Based on this research I will feed back to the Screening Mammographers in the St. Vincent’s service current quality of their CC images and highlight any training needs.

**P4 Technical assessment of a novel compression paddle – impact on technical performance**

**Ms Katy Szczepura, Mr William Mairs, Ms Catherine Taylor, Dr Claire Mercer**

1. Diagnostic Radiography, University of Salford
2. Christie Medical Physics and Engineering, Christie’s Hospital

**Background:** A novel compression paddle which measures applied pressure (kPa) rather than compression force (N) has recently been made available. Research shows that the use of this paddle could reduce patient discomfort without adversely affecting radiation dose and image quality. This work assessed the impact of using this paddle, when compared to a standard 18 cm x 24 cm rigid paddle, on equipment performance.

**Method:** All tests performed using a GE Senographe Essential Full Field Digital Mammography system (amorphous silicon detector). Standard tests were assessed following methods described in IPEM Report 89 and NHSBSP Report 0604.

**Results:** All safety checks found the new paddle functioned correctly, and there was no impact on light field size.

**Conclusion:** Performance of pressure based paddle is comparable with the standard rigid 18x24 paddle, with no appreciable adverse effect on either patient dose or image quality.

**References:**


**P5 Mammography compression values and the effect on Recall Rates in the NHS Breast Screening Programme**

**Ms Deborah Watson, West of Scotland Breast Screening Centre, UK**

**Purpose:** Optimal compression in digital mammography is crucial to enable accurate image interpretation and therefore appropriate visualisation of abnormalities.

There is conflicting evidence with regards to compression applied – to encourage screening adherence, minimal compression is desirable – however to obtain a diagnostically acceptable image, compression must be sufficient to avoid false-positive recalls.

This is a retrospective analysis of 150 women recalled to the review clinic for suspected abnormality in the form of Asymmetric Density, Parenchymal Distortion or composite breast tissue.

**Method:** Compressed breast thickness and compression applied during screening will be measured against that applied at assessment review. This would ascertain whether screening compression is optimal and a true compression is desirable – however to obtain a diagnostically acceptable image, compression must be sufficient to avoid false-positive recalls.

**Results:** It is our aim to review the data within our centre using inferential statistics in March 2016, report in April 2016 and re-visit the application of adequate compression through training sessions where appropriate.

**Conclusion:** As this audit is still in progress a final conclusion has not been reached however we expect it to demonstrate that poor compression leads to false positive recalls.

**Depend on results, further investigation may include analysis of flexi versus fixed paddle mammography.**

**References:**

1. Mercer C, Hogg P, Cassidy S, Denton E. Does an increase in compression force...
Mammographers awareness of breast compression

Mrs Janice Tannock
West of Scotland Breast Screening Service, UK

Purpose: Following image appraisal there has been suspected variation in applied breast compression between Mammographers. Following the introduction of Digital Mammography there have been several discussions amongst staff regarding image quality. Adequate compression has been proven to reduce radiation dose and decrease the likelihood of geometric un-sharpness and motion artefacts. As already proven, good compression results in adequate imaging. In contrast to this insufficient compression may result in deteriorated image quality and lesion visibility resulting in potential for incorrect diagnosis. This audit will assess Mammographer awareness of factors affecting how and why they apply their particular level of breast compression and aims to encourage self-audit and introduce changes to Mammography practice.

Methods: Staff group of 36 Mammographers will be asked to gain information on how they apply breast compression. In particular factors which influence how much breast compression is applied will be explored. The study group all work in a large Breast Screening Centre. Audit will be collected in the form of a multiple choice questionnaire. To avoid bias multiple choice options will reflect a wide scope of possible answers/outcomes. Questionnaire will be ready for staff participation March 2016

Results: Statistical analysis in the form of percentage, average and most commonly cited will be applied to audit. This will assist to determine factors affecting an individual’s decision making process surrounding breast compression. Results will be explored. Mammographer perception of the impact their personal choices regarding breast compression has on the client. Results will be available for statistical analysis/conclusion April 2016.

References:

P7 Does compression force and paddle design affect the performance of breast density software?

Ms Oliver Morrish, Mr Richard Black, Professor Fiona Gilbert
East Anglian Regional Radiation Protection Service, Cambridge University Hospitals NHS Foundation Trust, UK; Department of Radiology, University of Cambridge School of Clinical Medicine, UK; Department of Medical Physics and Clinical Engineering, Cambridge University Hospitals NHS Foundation Trust, UK

Purpose: Robust volumetric breast density measurements require methods that account for variations in breast thickness caused by the tilting of the compression paddle [1]. This study investigates whether automated density measurements are affected by compression paddle design and force applied.

Methods: Bilateral two-view mammograms were collected from six centres using compression paddles in either rigid or flexible modes. Volumetric breast density was assessed by two software tools QuantraTM (Hologic, Bedford, USA) and VolparaTM (Volpara Solutions, Wellington, New Zealand). Compression force and paddle mode was determined from DICOM header information. Women were stratified into groups defined by paddle mode and compression force quartiles. Software performance was quantified by Pearson’s correlation coefficient (r) between measurements from CC and MLO views of the same breast. Fisher’s z transformation was used to test for significant difference (p<0.05) between r.

Results: There were 6522 pairs of CC and MLO views using the rigid paddle mode and 6750 using the flexible mode. All measurements of breast volume were highly correlated in both rigid and flexible modes (r=0.97, p<0.001). For absolute dense volume and volumetric density both software tools demonstrated slight but significant reductions in correlation when the flexible mode was used compared to the rigid mode. (Quantra density from r=0.89, p<0.001 to r=0.86, p<0.001, Volpara density from r=0.90, p<0.001 to r=0.89, p<0.001). There was a downward trend in correlation coefficient as compression force increased for both paddle modes.

Conclusions: Compression paddle mode and applied force do affect the performance of breast density measurement software but the magnitude of this influence is small.

References:

P8 Digital Breast Tomosynthesis: an experience using reduced compression

Professor Kanaqa Chelliah
Universiti Kebangsaan, Malaysia

Mammography is the gold standard for breast screening and early detection of cancer. Women are discouraged to undergo screening due to pain experienced during compression hence detection of breast cancer is detected in the late stages despite availability of mammographic facilities. As a strategy to encourage women to come forward for screening, a study was done to determine the effects of reduced compression force on pain, anxiety and image quality using digital breast tomosynthesis (DBT). A prospective study was done using random sampling on 130 women with standard and reduced (50%, 60%, 70%) compression force. A validated questionnaire of 20 items on anxiety and level and a verbal rating scale-4 on the pain level was given to subjects pre and post mammography. Cranio-caudal(cc) and medio-lateral oblique projection of both breast was done using the standard but only the cc projection of one breast was done with reduced compression. Two independent radiologists evaluated the images using image criteria score and BI-RADS. Standard compression showed a significantly higher score on pain and anxiety level compared to the reduced compression (p<0.05). Two independent radiologists scored the standard and reduced compression mammograms as equal with a score of 87.5% and 92.5% respectively using ICS scoring. The BI-RADS score showed only 10% difference between standard and reduced compression for both radiologist. Minimal compression force to immobilize the breast reduced anxiety and pain level without compromising the image quality hence women would be encouraged to do screening for early detection of breast cancer.

References:
13. Miller, D., V. Livingstone, and P. Heribson, Interventions for relieving the pain and


P9 Pressure based mammographic compression: a feasibility study to determine operational level(s)
Dr Claire Mercer1, Dr Claudia Reis2, Mrs Katy Szczepura1, Professor Peter Hogg1
1 University of Salford, UK; 2 Escola Superior de Tecnologia da Saude, Portugal

Background: Research has established large variations in breast compression force within and between practitioners1. A requirement therefore exists for to standardise compression to improve client experience whilst minimising radiation dose and image quality differences2. Rationale: A new approach to breast compression, using pressure rather than force, has been suggested to reduce patient discomfort and improve consistency. Using this approach, the optimal pressure, based on breast detector footprint and thickness, has not been identified.

Methodological Detail: Ethical approval was granted for 25 participants, 5 in each age range: 20-29, 30-39, 40-49, 50-59, 60-69 and exclusion criteria applied. Following standard mammographic guidelines each participant had their breasts compressed for 4 views (RCC/LCC/RMLO/LMLO), commencing 5kPa, stepping through 1kPa increments to toleration level(s). No x-ray images were acquired. For each pressure level, thickness and compression force were collated. The 4 views were repeated with a pressure mat placed on the image receptor (Xsensorm) footprint, compression force and thickness readouts were collated for each pressure level.

Results: Proposed Analysis
Data will be normalised and gradients calculated for: pressure versus thickness, force and footprint. Gradients will be used to identify the optimum pressure range for future clinical trials.

No results will be included within this presentation.

References:

P10 Comparison of 2.3 & 5 mega pixel (MP) resolution monitors when detecting mammography image blurring
Mrs Rita Borgert1, Mrs Judith Kelly2, Mrs Beverley Scragg3, Professor Peter Hogg4, Mr Vincent Ma5, Mr Rob Abadir6
1 East Lancashire Breast Screening Unit, Burnley General Hospital, UK; 2 Countess of Chester Hospital, UK; 3 University of Salford, UK

Purpose/Background/Objectives: Image blurring in Full Field Digital Mammography (FFDM) is reported to be a problem within many UK breast screening units resulting in significant proportion of technical repeats and recalls. Our study investigates monitors of differing pixel resolution, and whether there is a difference in blurring detection between a 2.3 MP technical review monitor and a 5MP standard reporting monitor.

Methods: Simulation software was created to induce different magnitudes of blur on 20 artifact free FFDM screening images. 120 blurred and non-blurred images were randomized and displayed on the 2.3 and 5MP monitors they were reviewed by 28 trained observers. Monitors were calibrated to the DICOM Grayscale Standard Display Function [2]. T-test was used to determine whether significant differences exist in blurring detection between the two monitors.

Results: The blurring detection rate on the 2.3 MP monitor for 0.2, 0.4, 0.6, 0.8 and 1 mm blur was 46, 59, 66, 77and 78% respectively and on the 5MP monitor 44, 70, 83, 96 and 98%. All the non-motion images were identified correctly. A statistical difference (p <0.01) in the blurring detection rate between the two monitors was demonstrated.

Conclusions: Given the results of this study and knowing that monitors as low as 1 MP are used in clinical practice, we speculate that technical recall/repeat rates because of blurring could be reduced if higher resolution monitors are used for technical review at the time of imaging. Further work is needed to determine monitor minimum specification for visual blurring detection.

References:

P11 An evaluation of image grading at the Nottingham Breast Institute
Mrs Sarah Cardno1, Miss Faye Wigley1
1 Nottingham Breast Institute, UK; 2 Nottingham International Breast Education Centre, UK

Purpose of evaluation and objectives: To maximise cancer detection one of the mammographer’s professional commitments is to monitor and maintain high standards of image quality by engaging in a peer review programme.

PEER Review is part of the NHSBSP QA framework to ensure that standards of image quality are maintained and that individual performance is monitored to see if the standards of 75% good images are achieved. In order to accurately measure this, it is important that the criteria for image quality and grading are understood and the correct grades are given. As a training centre, Nottingham Breast Institute wanted to look at the differences in grading from individuals working at the unit, so that training could be given on the grading of images in order to standardize marking.

Specific image standards are well documented in practice however there is often some level of subjectivity which could result in inconsistencies of image quality.

The purpose of this exercise was to investigate differences in individual interpretation of grading criteria and how applying these differences could result in a false reflection of the actual standards produced by the department.

Method: Films were selected and identified as the test images. These images were then graded by the staff members of the NBI, which included both Assistant
The audit has identified three key conclusions:

2. Breast Screening Programme 2006 (NHSBSP publication 63).

Conclusions:


Symposium Mammographicum Conference 2016

P13 Early experiences using the Ideal Hotelling Observer Method in routine mammographic QA to predict scores for CDMAM phantom
Ms Eugenia Kulama1, Dr Lynn Martinez1
Royal Free NHS Foundation Trust, UK, 2Imperial College Healthcare NHS Trust, UK

Purpose/Background/Objectives: The CDMAM phantom is the basis of the image quality standards for digital mammography [2-6]. The ideal hotelling observer theory [1] states that it is possible to calculate the expected observer response for a detector based on measurements of a system’s modulation transfer function (MTF) and noise power spectrum (NPS).

Methods: All the measurements are performed during routine testing. The NPS is generated from images of a 5cm thick uniform stack of perspex imaged under AEC, using standard CDMAM exposure conditions. The MTF is generated using a tungsten edge at 2.5cm above the breast support table sandwiched in 5cm of perspex, with the grid and compression paddle in place. Analysis of images was carried out using OD, IQ, and the CDMAM predictions were calculated using in house software. Twelve mammography systems are from four different manufacturers were tested on a number of visits, to establish short and long term consistency of the measurements.

Results: Our results have been compared with those of the CDMAM software and were found in good agreement, within the calculated errors, for all systems.

Conclusions: The measurements required to produce a synthetic version of the CDMAM results are quick and easy to carry out the results compare well with the CDMAM results and are more consistent than the comparable phantom measurements. Therefore we believe that this technique can be used as a routine QA measurement.

References:


P14 Modulation Transfer Function in Routine Testing of Full Field Digital Mammography Systems
Mr Alexander McKillop, Mr Ryan Jones
Integrated Radiological Services, UK

Purpose/Background/Objectives: The relative contrast at a given spatial frequency is called the Modulation Transfer Function (MTF). Calculating this number gives a quantitative result of the detectors resolution properties. A quantitative measurement would remove subjectivity in such a measurement.

Methods: The TORMAX test object contains a resolution bar grating used in this study. Each bar pattern has a different spatial frequency, which is encoded into the MTF calculation within IQworks for bar gratings. NHSBSP equipment report 0604 [1] outlines the straight edge method for analysis within appendix 9. MTF can also be calculated using a resolution grating.

Results: The specimens of 10 patients undergoing biopsy of calcification were imaged in both the Kubtec (Xpert 20) and Faxitron (MX-20) cabinet x-ray imaging systems.

Conclusions: The ability to demonstrate representative calcification on biopsy specimen radiographs is crucial to ensure adequate tissue sampling when assessing calcification. We carried out a prospective review of 10 patients to evaluate and compare the visibility of calcification on specimen x-rays using both the Kubtec (Xpert 20) and Faxitron (MX-20) cabinet x-ray imaging systems.

Methods: The specimens of 10 patients undergoing biopsy of calcification were imaged in both the Kubtec and Faxitron. The images were reviewed by 7 radiologists who noted the following for each case: the number of calcium flecks seen on each of the cabinet monitors and the PACS monitor the contrast on the monitors before.
and after windowing and which cabinet x-ray system gave best visibility of the calcium specks overall. The results for all 7 clinicians were summated for all 10 patients.

Results: Kubtec and Faxitron showed 791 and 947 flecks on cabinet monitors, and 839 and 983 flecks on PACS monitor respectively. Better contrast pre-windowing was reported on Kubtec in 51 images, Faxitron in 14 images but was equal in 5 images. Better contrast post-windowing was reported on Kubtec in 4 images, Faxitron in 44 images and was but equal in 22 images. Overall calcium visibility was reported as best on Kubtec in 3 images, Faxitron in 49 images and equal in 18 images.

Conclusion: Overall, with windowing, Faxitron images gave better visibility of calcium flecks than Kubtec images, both on the cabinet monitors and on PACS. However, the Kubtec images showed better contrast prior to windowing.

P16 The detection of visual blurring in 1MP and 5MP monitors within mammography clinical practice
Mrs Lyndsay Kinneor1, Dr Claire Mercer2
1University of Salford, UK; 2University of Salford, UK

Background: Over 12 months within a UK breast screening service the number of technical recalls, due to image blurring, was high. 40,954 clients imaged within annum 0.88% recalls, 1.16% repeats, reducing between 1st and 2nd reads 2.04% overall. Over half of clients recalled of cancer but 1.2% repeated due to image blurring. Highlighting a number of ‘blurred’ images were not being identified at the time of examination.

Aim: To identify if the 1MP acquisition monitor (reviewing mammograms) was adequate to identify image blurring.

Methods:

DataSet 1, 50 anonymised mammogram images: 35 images categorised as blurred (technically recalled) and 15 diagnostic images (not technically recalled), 2 images readers classified these images intra and Inter-observer variability measured (Cohen’s Kappa).

DataSet 2, 100 anonymised mammogram images: 70 categorised as blurred, 30 categorised as not blurred (not technically recalled). 2 image readers and 4 practitioners classified these images twice within a 1 week interval on both 1MP and 5MP monitors.

Results:

DataSet 1: Kappa: 0.70

DataSet 2: Observers 1 and 2 displayed highest performance on both the 5MP (80, 82, 81 classified correctly) and 1MP (69, 76, 63, 72 classified correctly).

Observer 6 performed well on both monitors, in particular 5MP (79, 83 classified correctly). Observers 3, 4 and 5 produced similar performance levels on both monitors (1MP: 60, 5MP: 53)

1MP: Four of the six observers’ level of agreement reduced between 1st and 2nd reads

5MP: All but one observer achieved good agreement between 1st and 2nd reads

Conclusions: Overall the ability to detect image blurring clinically was improved on the 5MP monitor.

P17 BreastCheck, the National Breast Screening Programme in Ireland: 10 year review of a national programme prior to EUREF accreditation
Dr Patricia Fitzpatrick, Dr Therese Mooney1, Dr Grainne Greehy, Dr Fidelma Flanagan, Dr Aliden Larke, Dr Alissa Connors, Dr Ann O’Doherty
1National Screening Service, Ireland; 2University College Dublin, Ireland

Introduction: BreastCheck, the national breast screening programme in the Republic of Ireland, acquired EUREF level 4 accreditation in 2015. Digital mammography was introduced in 2007 at the time of national expansion.

Purpose: To review the key performance indicators (KPIs) from BreastCheck over the 10-year period (1 January 2004 to 31 December 2013) prior to EUREF accreditation.

Methodology: Standard performance indicator data are routinely collected from BreastCheck screening units.

Results: 972,236 women were screened in the period. Uptake initially rose following national expansion in 2007 but fell in subsequent years to a low of 70.2% in 2013, with the fall most marked in women attending for first screening. Following the introduction of digital mammography initial screening recall rates rose (average 4.9% in 2004 to 8.0% in 2013) while subsequent screening recall rates remained throughout the period within the target of <3%. Average rates of other KPIs were as follows: PPV 11.9% initial, 21.8% subsequent invasive cancer detection rate per 1,000 screened, 6.6 initial, 4.5 subsequent cancer detection rate <15mm 43% initial, 52% subsequent. DCIS rates were high, on average 21% of cancers detected at initial screening and 20% of cancers detected at subsequent screening however the majority (91% in 2013) were of intermediate or high grade. The standardised detection ratio rose steadily from 1.05 (2004) to 1.23 (2013). Strategies were put in place to improve uptake which have resulted uptake of +76% in 2015.

Conclusion: BreastCheck demonstrated sustained high-level performance in the decade prior to accreditation uptake remains a concern.

P18 The impact of Index of Multiple Deprivation (IMD) and Ethnicity on breast screening uptake in the North West of England
Professor Anil Jain1, Dr Jayeshwaraj Bholah2, Mr Philip Foden3
1The Nightingale Centre and Genesis Prevention Centre, University Hospital of South Manchester NHS Foundation Trust, UK; 2University of Manchester, UK

Aim: To investigate the impact of index of multiple deprivation (IMD) and ethnicity on breast cancer screening uptake in the North West of England.

Methods: Data for screening uptake rates were collected from 2005 to 2014 using data from the North West Breast Screening Units and the annual breast screening statistics reports. These were correlated with IMD published in 2007 & 2010. The uptake rates were also correlated with ethnicity data obtained from the census 2011. Then, the results for ethnicity were calculated using the Breast Cancer Risk Assessment Tool (3). Intention to attend will be compared with personal characteristics and the woman’s breast cancer screening attendance or informed choice.

Results: Both prevalent and incident uptake rates have declined from 2005/6 to 2013/14. Deprivation was shown to negatively correlate with breast screening uptake in all rounds, the strongest correlation being prevalent screening rounds (IMD 2007 p=0.005 & 2010 p=0.016). The incident round negative correlation was IMD 2007 p = 0.062 (significant) & IMD 2010 p = 0.163 (not significant).

Conclusions: Our results clearly show that the more deprived an area, the lower the breast screening uptake rate. Moreover, the higher the proportion of Asian in a population, the lower the uptake rates and this is more significant in the Pakistani and Bangladeshi group compared to the Indian and Chinese. Overall the impact is most marked in the prevalent round.

P19 Predictors of changing patterns of mammography attendance and informed choice in England
Miss Rebecca Crosby, Dr Sian Taylor-Phillips, Dr Christopher Stanton, Professor Aileen Clarke
University of Warwick, UK

Background: Mammography uptake is declining. The reasons for this are unclear. It is unknown whether the decline is due to factors such as barriers to participation or if more women are making an informed choice not to attend. Personal characteristics and the woman’s personal risk of breast cancer are thought to influence decisions of whether to attend and making an informed choice to attend (1). There is currently limited research on the effects of personal risk on informed choice and uptake specifically in mammography.

Aim: To explore if a woman’s breast cancer risk profile influences likelihood of mammography attendance or informed choice. A second aim will evaluate if personal characteristics (e.g. age, socioeconomic status, location) influence informed choice in breast screening.

Methods: Personal risk information, understanding of, and attitude towards, breast cancer screening, and intention to attend screening will be collected by a questionnaire delivered to women through participating screening centres. An informed decision will be calculated using the model developed by Marteau et al (2). Each woman’s personal risk estimate will be calculated using the Breast Cancer Risk Assessment Tool (3). Intention to attend will be compared with actual uptake obtained via screening centre data. The study will attempt to follow-up those who do not return questionnaires.
Conclusion: This research will be used to make recommendations for future informed choice and personalised risk communication decisions.

References:

P20 Strategies to address falling uptake of breast screening
Dr Patricia Fitzpatrick1,2, Ms Sinead O’Neill1, Dr Therese Mooney2
1National Screening Service, Ireland; 2University College Dublin, Ireland

Background: Uptake rose following national expansion (2007) of BreastCheck, the national breast screening programme in the Republic of Ireland (ROI) but fell to a low of 70.2% in 2013, most markedly for first screening. There is no age-sex population register in ROI and the population register is collated from multiple sources (duplication and deactivation of deceased is standard, however some women on the register might not exist at known address. Financial recession cut funding for advertising. Women provide a mobile phone number at their first appointment.

Methodology: Three strategies were undertaken to address fall in uptake: (1) A text messaging reminder service was introduced for women attending subsequent appointments (2) Registered letters were sent to 13,696 clients on the BreastCheck Register who had received 3 invitations (over 3 consecutive screening rounds) and who had neither attended nor made contact with the programme (3) New national advertising campaign was introduced October 2014.

Results: 4,053 records were deactivated following returned registered letters and there were 386 calls to the FreePhone line, with 37.5% women wishing to re-engage with the programme.

Table 1. Uptake rates 2013/2014

<table>
<thead>
<tr>
<th></th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>New initial</td>
<td>68.1%</td>
<td>69.0%</td>
</tr>
<tr>
<td>Previous round non attender</td>
<td>11.3%</td>
<td>12.9%</td>
</tr>
<tr>
<td>Overall Initial</td>
<td>41.2%</td>
<td>49.7%</td>
</tr>
<tr>
<td>Subsequent</td>
<td>85.7%</td>
<td>88.8%</td>
</tr>
<tr>
<td>Overall</td>
<td>70.2%</td>
<td>76.5%</td>
</tr>
</tbody>
</table>

Conclusion: The combination of removal of artefactual uptake decline and measures to address real decline have resulted in a rapid improvement in uptake in all categories of invitee uptake monitoring continues.

P21 Nudging women toward their breastscreen
Ms Vicki Pridmore
Breastscreen Victoria, Australia

Purpose: Using behavioural economics (BE), a series of two-arm randomized control trials tested the content of breast screening program invitations on uptake by:
• Responders to the first screening invitation
• Long term non-responders

Background: BreastScreen Victoria (BSV) screens 250,000 women annually. 20,000 women ignore their first invitation.

The UK Nudge Unit’s successful application of BE to increase tax compliance prompted the testing of screening invitations using BE principles, to engage ‘missing’ women.

Methods: A modification to BSV IT infrastructure enabled rolling randomised trials to test letter variations against a control letter allowing BSV to confidently include (statistically significant) changes into business as usual.

The trials ran for three months and targeted two groups:
• Women due to receive their first invitation letter
• 36,000 women who had ignored their invitation

Results: For the cost of an iPad and some considered changes to the invitation letter, almost 2,000 additional women booked their first appointment during the trial period.

P22 Could a pictorial breast screening invitation help to increase uptake to breast screening in a multi ethnic population?
Ms Karen Wren
University Hospitals of Coventry and Warwickshire

Study Aim: To investigate the viability of a pictorial breast screening invitation producing a higher uptake for breast screening amongst a multi ethnic population when used in conjunction with the national standard invitation. The effectiveness will be judged by the effect it had on previous non-attenders (PNA).

Design: A non-probability sampling technique with a purposed full homogenous population from three preselected GP practices serving multi-ethnic populations.

Need for Study: The effectiveness of any screening programme is dependent on high acceptance. Low rates of coverage by certain populations would lead to health inequalities. Studies have established that screening coverage is not uniform across the population and that women from Black Minority Ethnic (BME) communities have lower uptakes to breast screening. Language has been cited as predominate barrier.

Services with populations of diverse culture, may find that translating invitations does not solve the problem. Converted transcripts are often of poor quality, inappropriate for people who cannot read their mother tongue or whereby there is no written form.

Conclusions: The participation rate of BSS has remained at poor 10% since 2005, although the overall participation rate has increased from 29.7% to 39.6%, as most of these take place outside of BSS. Amongst the cancers diagnosed at our assessment centre, some denied the presence of a lump at screening only to admit to it at assessment. This may be due to the heavy subsidy of screening compared to diagnostic mammography.

There are also a number of women who subsequently either decline biopsy for a suspicious lesion or default from definitive treatment.

More has to be done about patient education to achieve any measure of success of BSS.

References:

P24 What are your statistics? – An informative guide for film readers in the NHS breast screening programme
Mrs Monica Howard, Dr Eleanor Comford
Nottingham Breast Institute, UK

Conclusions: The nudes are working with statistically significant increases as evidence. Once included in business as usual, the estimated impact is 4000+ additional women screening annually.

BSV is now trialling the same approach on women returning for subsequent screening rounds.

P23 Breast Screen Singapore (BSS): The Challenges and Difficulties
Dr Jill Wong, Dr Patrick Teo
National Cancer Centre, Singapore

Background: Singapore has one of the highest breast cancer incidence rates in Asia and is also the No. 1 cause of cancer related mortality amongst Singaporean females. The national screening program, BSS, was introduced in 2002, with the aim to reduce mortality from this disease.

In this study, we illustrate the challenges and difficulties faced in BSS since its inception and why ultimately it may not achieve its primary aim.

Methods: The BSS database was searched for diagnosed cancers assessed at our centre in 2014. A total of 134 clients were found and these were reviewed for 1) Known but undeclared symptoms at the point of screening 2) Delayed or defaulted from definitive treatment.

Conclusions: The participation rate of BSS has remained at poor 10% since 2005, although the overall participation rate has increased from 29.7% to 39.6%, as most of these take place outside of BSS. Amongst the cancers diagnosed at our assessment centre, some denied the presence of a lump at screening only to admit to it at assessment. This may be due to the heavy subsidy of screening compared to diagnostic mammography.

There are also a number of women who subsequently either decline biopsy for a suspicious lesion or default from definitive surgery after a biopsy result of cancer. These numbers would adversely affect the overall mortality benefit for apparent screen detected cancers.

More has to be done about patient education to achieve any measure of success of BSS.

References:
P26 The international use of mammographic screening test sets
Professor Alastair Gale, Dr Yan Chen
Loughborough University, UK

Purpose: There is growing international interest in using mammographic test sets to gauge levels of reading ability. To examine the utility of using such test sets the data of 1,009 radiologists from the USA, UK and other European countries were examined.

Method: At the Society for Breast Imaging Symposium (Florida, 2015), 247 American radiologists (US) read a test set of 20 recent challenging screening cases from the UK’s PERFORMS scheme using 20 mammographic workstations and reporting these online. A similar mini-lab was run at the EUSOBI (London, 2015) meeting where 42 European radiologists (EU) read the same cases using four workstations. For comparison purposes the data of 720 radiologists (UK) who had read the same cases as part of the UK annual scheme were extracted.

Results: A one-way ANOVA showed that there was no significant difference between sensitivity among these groups (mean values: UK 78.94%, US 66.78% and EU 80.24%. p=n.s.). However, there was a significant difference in specificity between the UK and US (p<0.001) and between the UK and EU (p=0.05). Means were: UK 83.46%, US 82.18% and EU 74.05%. There was no significant difference between US and EU (p=n.s.).

Conclusions: When the same test cases are examined by radiologists from different countries then broadly similar sensitivity scores are attained, demonstrating the universality of radiological education. The main difference between the three groups was found for the US specificity scores which reflects the different clinical management of potential assessment cases as compared to European countries.
At the interphase between the denser fibro-glandular elements and the retro-glandular adipose tissue the mammographic features are particularly variable. This peripheral glandular zone (PGZ) has been previously identified as the site of a significant number of cancers occurring in women under the age of fifty.

This study is a review of missed invasive cancers (referred to as One Reader CAs), by location and their mammographic characteristics. Specifically, the proportion that was defined as lying in the PGZ (see diagram on poster).

Methods: This observational series reviews the location and features of 140 consecutive invasive breast carcinomas missed by one experienced Breastscreen Reader. The carcinomas are the most challenging for readers (Table 3).

Optimising detection of clinically significant cancers less than 20 mm diameter is a primary screening goal, and is associated with a 5 year of up to 98%.

The Periphery of the fibro-glandular tissue is therefore an important Area of Review as readers complete their visual search of a screening mammogram.

Conclusions:
• The PGZ was the location of 74.3% of invasive carcinomas missed by one experienced Breastscreen Reader
• Less than a quarter of One Reader CAs were located in the traditional areas of Mammographic Review
• Cancers detected by architectural distortion (alone) in the PGZ are the most challenging for readers (Table 3)
• Optimising detection of clinically significant cancers less than 20 mm diameter is a primary screening goal, and is associated with a 5 year of up to 98%
• The Periphery of the fibro-glandular tissue is therefore an important Area of Review as readers complete their visual search of a screening mammogram.

References:
POSTER PRESENTATIONS

Symposium Mammographicum Conference 2016

Results: 116 C/O cases were recorded from 32,344 women screened in 2014. 55% (n=64) of C/O cases were recalled to AC, the remaining 45% were returned to routine recall. Of the cases recalled 24 had a mammographic abnormality on screening mammography which would have generated a recall to AC regardless of C/O. 13 malignancies were detected from these 24 cases. Of the 40 cases recalled with no mammographic abnormality on screening mammography one malignancy and one benign papilloma were detected. In both of these cases the C/O symptom was ‘lump’ and mammography depicted dense glandular parenchyma pattern.

Conclusions: This audit confirms that when a malignancy is present in C/O cases it is usually evident on screening mammography. In addition, this audit demonstrates and supports our clinical practice of having a lower threshold for recall to AC for C/O cases of ‘lump’ when there is dense parenchyma pattern.


P32 A multivariable analysis of survival in screened and symptomatic patients Mr Richard Harland Wrightington, Wigan & Leigh NHS Foundation Trust, UK; 2 Ramsay Euxton Hall Hospital, UK

Objective: To answer the question ‘Is a person with a screen detected cancer more or less likely to die than one who presented symptomatically?’

Method: I reviewed records of 3210 patients who presented through the symptomatic clinic (1808) or breast screening program (1402) with new or recurrent breast cancer between September 1991 and April 2012. Patients referred directly from screening to their local units were not included. Estimated ascertainment was 75–82% of all patients treated in the period. 806 patients had died. Median censored survival was 8.13 years for women with no mammographic abnormality on screening mammography. Median censored survival was 8.13 years for women with no mammographic abnormality on screening mammography. Variables were omitted when p>0.15. The model allowed for decreasing survival towards extremes of age.

Breast screening does have the potential to detect biologically adverse breast cancers at an earlier stage. Intensified screening at the lower age range of the programme would appear likely to give the greatest benefit.


P33 Characteristics of metastatic breast cancer and the implications for breast screening Dr Michael Crotch-Harvey Macclesfield District General Hospital, UK

Objective: To determine the impact of staging computerised tomography scan in the management of locoregional recurrence of breast cancer

Method: Patients presenting to Leeds Hospitals Trust with locoregional breast cancer recurrence between

Results: was obtained from a separate audit of screen detected cancers from January 2014 to June 2015. As this was a retrospective audit, ethical approval was not sought. Statistical comparison of mean tumour size in the two groups was performed with a two sample t-test.

Results: 204 women with metastatic breast cancer were identified. Mean age at presentation was 56.5 years. 40% occurring between the ages of 48-59. Adverse features predominated in women with metastatic breast cancer 50% were grade 3 and 41% grade 2. A strong correlation with high Ki67 proliferation index was noted 82% showed a Ki67 greater than 20. Of 247 screen detected cancers, a total of 103 cases showed at least one adverse prognostic indicator (41%). The mean size of tumours showing at least one poor prognostic indicator was 34mm in the metastatic group and 17mm in the screening group (p<0.0001).

Conclusions: Breast screening does have the potential to detect biologically adverse breast cancers at an earlier stage. Intensified screening at the lower age range of the programme would appear likely to give the greatest benefit.

**January 2010 and December 2014 were identified using electronic patient records. Those with complete clinico-pathological details and staging CT at the time of recurrence (breast, chest wall or ipsilateral axilla to primary site) were included. Cases were stratified as: true positive (TP) = unequivocal metastases on CT report, histopathological confirmation of metastases had been obtained or increase in size on interval (3 month) scan demonstrated true negative (TN) = still metastases free at 6 months false positive (FP) = spontaneous resolution of abnormality on 3 month interval scan false negative (FN) = detection of lesions on interval scans within 6 months.

**Results:** 81 patients were included. The average time between primary diagnoses to recurrence was 4.91 years (0-42). Most were grade 3 cancers (n=38) and node positive (n=65). 37 chest wall recurrences, 31 breast recurrences and 13 axillary recurrences were identified. 36/43 TN cases and 5/28 TP cases had surgery. 5 TP cases had small volume disease only. 6/7 FN cases (8.64%) had surgery inappropriately. There were no adverse impacts in the 3 FP cases. The sensitivity, specificity, positive and negative predictive values for staging CT were 80.00%, 93.48%, 90.32% and 86.00% respectively.

**Conclusion:** This study suggests that staging CT is a valuable stratifying tool that enables appropriate management in the vast majority of locoregional recurrences.

**P35** Should shearwave elastography findings influence management of breast abnormalities in the one stop clinic?

Dr Sylvie Flais, Dr Anwen Newland
London North West Healthcare NHS Trust, UK

**Background:** Preliminary findings about shearwave elastography (SE) associated with ultrasound have shown some interesting cases and discuss the impact of machine in April 2014. SE was not done in all cases since our department purchased a GE LOGIQ E9 US elastography (SE) associated with ultrasound have been performed or increase in size on interval (3 month) scan demonstrated true negative (TN) = still metastases free at 6 months false positive (FP) = spontaneous resolution of abnormality on 3 month interval scan false negative (FN) = detection of lesions on interval scans within 6 months.

**Results:** 81 patients were included. The average time between primary diagnoses to recurrence was 4.91 years (0-42). Most were grade 3 cancers (n=38) and node positive (n=65). 37 chest wall recurrences, 31 breast recurrences and 13 axillary recurrences were identified. 36/43 TN cases and 5/28 TP cases had surgery. 5 TP cases had small volume disease only. 6/7 FN cases (8.64%) had surgery inappropriately. There were no adverse impacts in the 3 FP cases. The sensitivity, specificity, positive and negative predictive values for staging CT were 80.00%, 93.48%, 90.32% and 86.00% respectively.

**Conclusion:** This study suggests that staging CT is a valuable stratifying tool that enables appropriate management in the vast majority of locoregional recurrences.

**P36** Audit of biopsy results of U3 masses

Dr Sylvie Flais, Dr Anwen Newland, Dr Nadia Uraqui
London North West Healthcare NHS Trust, UK

**Background:** The UK U3 grading is considered an equivalent of BI-RADS 4a and 4b. The malignancy rate in the BI-RADS classification is better established than for the UK classification. The aim of the audit was to correlate the ultrasound grading with final histology to see whether our results were in line with expectations and review unexpected findings.

**Method:** All biopsies of U3 masses between November 2013 and January 2016 were prospectively recorded, along with age and histology result (core biopsy for most cases, post surgical if performed).

**Results:** 196 U3 masses were biopsied. Final histology was B2 in 77% (142 cases), B3 in 14% (28 cases) and B5 in 13% (16 cases). Imaging was reviewed in all B3- B5 cases to assess the accuracy of the initial grading. There was no significant disagreement, although in 2 cases the U3 grading seemed to have been influenced by the young age of the patients, and the findings could have been graded U4.

**Conclusion:** The result of our audit supports the U3 category being equivalent to the BI-RADS 4a grading, the expected rate for malignancy appearing lower than in the BI-RADS 4b sub category.

**P37** Is a mammogram following cyst aspiration always required in the screening assessment clinic?

Mrs Ruth Fry, Dr Karen Lilton, Dr Nicholas Ridley
Wiltshire Breast Screening Unit, UK

**Background/Purpose:** The authors had noticed a variation in practice from previous places of work to their current workplace, noticing that post cyst aspiration mammograms were often requested routinely. A retrospective audit was designed to look at the use of post cyst aspiration mammography.

**Method:** All patients attending breast screening assessment clinics undergoing US guided cyst aspiration during a four month period were included. Data included: additional post-aspiration films taken, dose, cyst size, management change and outcome. For interest the poster will also survey conference delegates on their current practice.

**Results:** 32 patients had cysts aspirated 27 (84%) of these patients had additional views following this. All cysts were simple on ultrasound and cytology was not requested in any cases. No patients required any additional intervention and the outcome was routine recall in all cases. The average additional dose to the patients undergoing further films was a mean AID of 0.19. The study will demonstrate the use of mammography following cyst aspiration.

**Conclusion:** Post aspiration mammography confirms that the aspirated cyst corresponds to the mammographic finding.1 This audit shows that undertaking this routinely increases patient dose and often does not change patient management. Post cyst aspiration mammography may be useful if there is radiological uncertainty that the cyst aspirated corresponds to the mammographic abnormality or if there is a concern about a masked underlying lesion or distortion.

**References:**

**P38** The added value of MRI in preoperative breast cancer staging

Dr Tamara Suarez, Dr Hannah DuPrez, Dr Charlotte Longman, Dr Rashid Akhter
St Bartholomews Hospital, UK

**Background:** Neo-adjuvant chemotherapy (NAC) is increasingly used to down-stage the breast and axilla in node-positive breast cancer with high rates of pathological complete response (pCR), particularly in triple negative and HER-2 positive subtypes (1,2). The Alliance Z1017 trial and subsequent studies (3,4) have demonstrated lower false negative sentinel lymph node biopsy (SLNB) rates when C5 meteoric nodes are clipped prior to NAC and excised at subsequent surgery. We describe our initial axillary marker clip
experience with radiological, surgical and pathological correlation.

Method: Over 11-months, 19 patients had marker clips inserted into C5 metastatic axillary/intramammary nodes under ultrasound guidance either before or early after starting NAC. A specimen radiograph was performed following excision to identify the clip and pathological results analysed.

Results: All clips were successfully deployed. Ultrasound visualization at interval follow up was variable. 1 patient did not have surgery (metastases), 7 are still receiving NAC. 9 underwent SLNB (7/9 pCR) and obtained at further targeted dissection in 6/9.

Conclusion: Preoperative marking of positive axillary nodes prior to NAC is feasible, demands a multidisciplinary team approach and may prevent the need for ALND. The low rate of clip presence within the SLN suggests targeted dissection will reduce false negative rates.

References:
Special views were considered beneficial where they increased specificity and allowed an equivocal diagnosis to be upgraded to probable or definitive. The upgraded diagnosis had also to be consistent with any subsequent interventional diagnosis.

Results: 151 women were assessed over 2 months. Magnification views were not found to alter the radiologic opinion for any of the women assessed but increased specificity was achieved with paddle views for 36% of cases. Three of these women had cyst aspiration and seven had no intervention.

Conclusions: Changes in practice have possibly led to the reduction in usefulness of magnification views. While these were the only views that clearly aided visualisation, calcification is generally routinely biopsied.

Increased specificity was achieved with paddle views (36%), but not to the same extent as in 1991, with asymmetries and distortions realising most benefit.

References:

P44 Marker placement accuracy following stereotactic-guided biopsy
Mrs Judith Kelly, Mrs Andrea Herbert, Mrs Sara Millington
Countess of Chester Hospital NHS Foundation Trust, UK

Background: It is common practice within breast imaging units following stereotactic-guided biopsy to deploy gel markers for future biopsy site location. Post insertion mammograms are performed to verify placement accuracy. We noticed some markers were not demonstrated in the desired position on occasion. Published literature discusses the ‘accordion’ hypothesis effect whereby the marker moves along a biopsy track following compression release.

Purpose: We conducted an audit to: ascertain how many markers appeared to be inaccurately sited following insertion after stereotactic-guided biopsy: marker type more prone to inaccuracy: analyse if any trends apparent, for example – 14g or 10g, breast type, patient biopsy position.

Method: No current standard marker accuracy guidance published. Royal College of Radiologists standard for wire localisation proximity to lesion was utilised 1. All 144 stereotactic-guided biopsies with marker placement from 2013-2015. Four different markers were used following either 14g, 10g vacora or EnCor vacuum-assisted biopsy. These included two types of ‘SenoMark,’ ‘EnCor’ and ‘Hydromark.’ Post marker insertion mammograms were performed and marker proximity to lesion measured. Data regarding breast density BIIRADS score, abnormality type, location, compression thickness reading and Newtons of compression force was recorded for each case.

Results: Three of the markers showed an inaccuracy rate ranging from 37-48%. The ‘Hydromark’ proved much better, demonstrating an inaccuracy rate of only 6%.

Conclusion: Findings from this audit suggest ideally exclusive use of the HydroMARK following stereotactic-guided biopsies (10g/14g) in the immediate future. However, these are not compatible with the ‘EnCor’ biopsy system.

References:

P45 Surveillance of women at higher risk of developing breast cancer – Our first year
Ms Celia Lucas, Dr Diane Johnston
Chelmford and Colchester Breast Screening Service, UK

Background: It is common practice within breast imaging units following stereotactic-guided biopsy to deploy gel markers for future biopsy site location. Post insertion mammograms are performed to verify placement accuracy. We noticed some markers were not demonstrated in the desired position on occasion. Published literature discusses the ‘accordion’ hypothesis effect whereby the marker moves along a biopsy track following compression release.

Purpose: We conducted an audit to: ascertain how many markers appeared to be inaccurately sited following insertion after stereotactic-guided biopsy: marker type more prone to inaccuracy: analyse if any trends apparent, for example – 14g or 10g, breast type, patient biopsy position.

Method: No current standard marker accuracy guidance published. Royal College of Radiologists standard for wire localisation proximity to lesion was utilised 1. All 144 stereotactic-guided biopsies with marker placement from 2013-2015. Four different markers were used following either 14g, 10g vacora or EnCor vacuum-assisted biopsy. These included two types of ‘SenoMark,’ ‘EnCor’ and ‘Hydromark.’ Post marker insertion mammograms were performed and marker proximity to lesion measured. Data regarding breast density BIIRADS score, abnormality type, location, compression thickness reading and Newtons of compression force was recorded for each case.

Results: Three of the markers showed an inaccuracy rate ranging from 37-48%. The ‘Hydromark’ proved much better, demonstrating an inaccuracy rate of only 6%.

Conclusion: Findings from this audit suggest ideally exclusive use of the HydroMARK following stereotactic-guided biopsies (10g/14g) in the immediate future. However, these are not compatible with the ‘EnCor’ biopsy system.

References:

P46 Clinical evaluation of multimodal ultrasound tomography for breast imaging
Dr Serafino Forte, Dr Isabella Zbinden, Dr Sophie Dallas, Dr Bram Stiletjes, Professor Georg Borgantz
Clinic of Radiology and Nuclear Medicine, University of Basel Hospital, Switzerland

Purpose: We evaluated the practical implementation of multimodal ultrasound tomography (MUT) for breast imaging in a clinical setting. Twenty-four healthy volunteers and thirty-two patients referred for breast imaging were scanned and exam comfort reported.

Methods: We evaluated feasibility, investigation time, exam comfort of MUT compared to X-ray mammography (MG, n = 31), handheld ultrasound (US, n = 27), and magnetic resonance imaging (MRI, n = 4) in thirty-two patients.

Results: 62 women were imaged in the first year. Of the MRI only group 2 women were recalled: one required an MRI guided biopsy (benign), the other an early imaging recall. Of women receiving MRI plus mammography 5 were recalled: 3 were positive for cancer and 2 were recalled early resulting in return to annual surveillance. In the mammogram only group 2 cancers were diagnosed.

Conclusion: Inviting women for pre-imaging counselling has aided compliance for MRI with no abandoned studies as compared to our symptomatic population. Verbal feedback indicates appreciation of the initial consultation as it aids understanding and preparation for imaging and results. Due to the high number of cancers diagnosed in our first year we were unsurprised to miss the minimum recommended recall rate standard.

References:
1. NHSBSP Publication 74. Protocols for the surveillance of women at higher risk of developing breast cancer. Version 4 June 2013
2. NHSBSP Publication 68. Technical guidelines for magnetic resonance imaging for the surveillance of women at higher risk of developing breast cancer December 2012
POSTER PRESENTATIONS

P48 Radiowave radar-based breast imaging system: an initial multi-site clinical evaluation

Professor Iain Lyburn1, Dr Mike Shere2, Dr Sarah Taylor1, Dr Lyn Jones3, Dr Nick Ridley4, Dr Helen Winton5, Professor Alan Pearce6
1Great Western Hospitals NHS Foundation Trust Great Western Hospital, UK; 2Bristol Breast Care Centre, North Bristol NHS Trust, UK; 3Thirlestaine Breast Centre, Gloucestershire Hospitals NHS Foundation Trust, UK; 4Bristol University, School of Clinical Sciences, UK; 5Micrima Limited, UK

Objective: To determine the effectiveness of MARIA (Micrima Ltd, Bristol UK) – a non-ionising, non-compressing whole-breast scanning system utilising radiowaves – in symptomatic breast care clinics.

Methods: Patients attending symptomatic clinics at 3 sites were identified by clinicians as having a palpable lump. Following informed consent eligible patients underwent this probe imaging technique. The bilateral reconstructed 3D images were correlated with clinical information and other imaging studies including ultrasound and mammography when relevant, core biopsy results to determine sensitivity scores. [Ethics approval (Yorkshire & The Humber South Yorkshire REC 15/YH/0084, ClinicalTrials.gov NCT02493595).]

Results: Of 87 cases analysed to date, a sensitivity of 77% (67/87) was obtained for lesion detection (mean age 45.4 years, age-range 16-81). Sensitivity was 90% (28/31) for cysts and 85% for cancers (23/27). Sensitivity scores in peripheral and central lesions were 99% (10/10) and 99% (9/9) respectively. The results of this study are very encouraging. We are continuing to evaluate this exciting novel imaging technique.

P49 Evaluation of novel breast imaging technology of multimodal ultrasound tomography in BI-RADS IV patients

Professor Vasiliis Marmarelis1, Professor George Zografos2, Dr Paraskevi Liakou1, Dr Dimitra Koulouchi1, Mr Michael Sofras2, Dr Stefanos Hadjigianakis3
1University of Southern California, USA; 2University of Athens, Medical School, Greece; 3Mastoscopia S.A., Greece

Purpose: Initial clinical evaluation (not randomized clinical trial) of the new 3D breast imaging technology of Multimodal Ultrasound Tomography (MUT) in 254 BI-RADS IV patients presenting microcalcifications, architectural distortions or small masses (<15 mm).

Methods: MUT performs 3D tomographic scanning of pendulant breast in water-bath using transmission ultrasound and constructs multimodal images of refractivity and frequency-dependent attenuation (calibrated relative to water). The multimodal images are fused into composite images of a computed Composite Index (CI). CI-1 indicates malignancy in the respective tissue voxel (0.5 mm x 0.5 mm x 4 mm). 3D MUT imaging was performed on 254 BI-RADS IV female volunteers (ages 32-78 years), who subsequently underwent biopsy. All volunteers signed the Informed Consent Form approved by the Research Committee of the University Hospital. The composite images were evaluated against the biopsy results.

Results: Histopathology revealed 83 malignant, 17 atypical and 194 benign lesions. The pixels of 78 malignant lesions (94%) had CI-1 in the biopsy region, while the 17 high-risk lesions and 5 small DCIS (<4 mm) had 0.8<ci<1 were found near 14 benign lesions (within 25 mm) and in 52 cases away from the biopsy location.<ci

Conclusions: The MARIA system offers as a well-tolerated non-ionising imaging modality that has been shown to be effective at detecting cancers in younger, pre-menopausal women with dense breasts. MARIA may contribute to overcoming some of the challenges posed by trying to optimise the balance between benefit and harm of screening in women of younger age. The results of this study are very encouraging. We are continuing to evaluate this exciting novel imaging technique.

Conclusions: MUT can detect small (<15 mm) malignant breast lesions in BI-RADS IV patients and differentiate them from high-risk and benign lesions. When the additional MUT findings near and/or away from the point of biopsy are evaluated carefully in the future, the potential of MUT as a screening modality can be ascertained.

P50 Initial experiences in the implementation and use of Tomosynthesis in a district general hospital

Mrs Sarah Fox, Mrs Christine Batts, Mrs Bernadette Roberts, Mrs Janet Hendy
Northern Lincolnshire & Goole NHS Foundation Trust, UK

Purpose: This paper demonstrates the pathway taken to implement Tomosynthesis as a means of diagnosing small cancers in complex cases within a district general hospital. Numbers and types of patients were analysed post installation to assess the impact of using Tomosynthesis to aide diagnosis.

Method: A case of need was presented to the Trust and charitable fund committees justifying the proposed use of Tomosynthesis and associated infrastructure requirements. Records were analysed to demonstrate type of patient imaged including dense parenchyma, summation and use for satellite screening assessment.

Results: The pathway taken for purchase and implementation was complex with many papers required to justify new technology to numerous committees.

Between October 2013-February 2016 726 examinations were undertaken with a diagnosis of 57 breast cancers (7.8%) 51% (n = 371) examinations were undertaken for dense parenchyma with 23% (n=168) undertaken for summation. 11.8% (n=86) were undertaken as part of breast screening assessment with the remainder comprising symptomatic cases.

Conclusion: Implementation of Tomosynthesis has been a complex process which has proved to be a valuable asset to the Trust, in the interpretation and management of difficult cases.

P51 Tomosynthesis – can it find the difficult lesions?

Dr Nerys Forester, Dr Joanne Gholkar, Dr Brenda Kaye
Newcastle Teaching Hospitals, UK

POSTER PRESENTATIONS
Background: Tomosynthesis (DBT) creates a 3D picture of the breast, potentially providing more diagnostic information. Studies have shown it may offer improved screening, potentially identifying disease not seen on standard mammography. We decided to evaluate the performance of tomosynthesis in the setting of mammographically subtle/occult tumours identified by MRI.

Methods: Between 2014 and 2015, all patients undergoing 2nd look ultrasound following MRI for previously unidentified lesions, underwent DBT before USS. DBT analysed to identify areas of disease by two independent radiologists, without knowledge of prior outcomes. All lesions seen on MRI had confirmed pathology after USS and biopsy.

Results: 30 patients had DBT following MRI. The majority of cases had dense breast parenchyma. All had one or more lesions present. Tumour sizes ranged from 5-40mm. There were 9 benign cases and 21 cancer cases. Of 21 cancer cases 9 cases identified by both readers, 5 cases missed by both readers, 4 cases index cancer identified but both missed extra cancer foci and 3 cases where extra foci identified by one reader but not by second reader. For cancer cases, reader concordance ~ 18/21. From 21 cancer cases, there were 34 malignant lesions. Readers correctly identified 21/22 lesions, giving an overall PPV of 61-64%. ‘Missed’ cancer sizes ranged from 6-35mm.

Conclusions: DBT shows good reader concordance, but does have a significant tumour ‘miss’ rate. Deliberately picked cohort of difficult breasts to evaluate, but it appears that DBT suffers from similar disadvantages to mammography in dense breasts.

P52 Contrast Enhanced Spectral Mammography – The Kettering Model
Mrs Deborah Black, Miss Katalin Horvath
Kettering General Hospital, UK

Background: Contrast Enhanced Spectral Mammography is a relatively new imaging modality. In the UK CESM is primarily performed as a Radiologist Clinician led initiative, usually in larger breast imaging centres. However, for the smaller breast imaging unit, a Radiologist led initiative is not practical.

Methodology: Can CESM be successfully incorporated into symptomatic assessment in any Breast Imaging Unit as a Radiographer led initiative?

Results: ‘The Kettering model’
In order to integrate CESM into a rapid diagnosis clinic we identified the need to utilize the skills of our Mammographers and implement CESM as a Radiographer led initiative with Radiology input at a clinical supervision level only. Four Mammographers volunteered to expand their job role by undertaking cannulation training and becoming clinical leads for CESM.

The introduction of the Kettering Model offers Mammographers the opportunity to develop new skills without any further Masters level study, making it more widely achievable to both Band 6 and Band 7 practitioners.

We have observed benefits for both the patients and the Practitioners who perform CESM. Radiographers have reported increased job satisfaction. Continuing to diversify the job roles and responsibilities of Mammographers may help in addressing the national struggle to recruit into Mammography.

P53 Applications of Contrast Enhanced Spectral Mammography in the Symptomatic Setting
Mrs Rhonda Griffiths
Guys and St Thomas NHS Trust, UK

Contrast enhanced spectral mammography (CESM) is a relatively new technology, which aims to identify tumours that would otherwise be mammographically occult. It is currently in use in several European centres, in various centres in the UK and in 2015 was introduced to our unit at Guys Hospital. Our department is a large Symptomatic Breast Unit which also specialises in Breast Surgery and Oncology. We are also a regional referral unit for South East London.

The majority of CESM cases undertaken at Guys have been in accordance with our local written protocols. It has however also been used as a problem solving tool in more complex cases which have been discussed through the Multi Disciplinary Meeting. This poster will be a pictorial review demonstrating both typical and atypical CESM cases. Typical cases will include a patient under 40 with dense breasts and an elderly patient with multifocal disease. The more atypical cases will include a gentleman with suspicious findings, a neo-adjuvant chemotherapy patient and a patient who attended the unit for a wire localisation prior to her surgery.
POSTER PRESENTATIONS

Symposium Mammographicum Conference 2016

Conclusion: In patient’s who have not undergone NAC our MR size is within acceptable criterion when compared to final pathological size validating the sensitivity of breast MR as a tool for accurate measurement of disease extent. In post NAC patients, there is a wide variation in the accuracy, this variation is attributed to several preoperative factors.

P56 An audit of clinical indications for Breast MRI
Dr Tamara Suaris, Dr Hannah DuPreeg, Dr Rashid Akhter, Dr Charlotte Longman, Dr Joseph Davies St Bartholomew’s Hospital, UK

Background: Breast MRI has become a standard part of the imaging armory of the diagnostic breast imaging team. Its role is most often used for preoperative cancer staging, but also for high risk family history screening and for implant assessment. There is the impression that there are increasing numbers of MRI performed. Using the EUSOMA MRI indications guidelines, we questioned whether there was indication drift occurring.

Methods: A retrospective review of all MRI requests accepted for women with known or suspected breast cancer accepted over a 3 year period was performed.

The indications were reviewed and aligned with the EUSOBI indications from 2008.

Any indication that fell outside of the guideline was highlighted and reviewed for acceptance

Results: Of the 296 MRI studies performed, 263 (89%) were preoperative staging studies. 70 patients in this group underwent MRI to assess treatment response to neoadjuvant chemotherapy. 17 patients (6%) underwent MRI for indications listed outside the EUSOBI guidelines. 16 (5.4%) of these had MRI to confirm malignancy was unifocal.

Further assessment will be made to identify if the index lesion was difficult to visualise, seen in the context of a dense parenchymal breast pattern.

Conclusion: Breast MRI is a useful modality in patients with known breast cancer. At our institution the majority of breast MRI is performed in accordance with EUSOBI guidelines. However a minority are performed to confirm known breast cancer is unifocal, an area that EUSOMA have been clear requires further research.

References:

P57 Acute breast pain: could it be sarcoidosis?
Dr Ruth English
North Middlesex University Hospital NHS Trust, UK

Background: A common cause of acute breast pain is infection or abscess. Sarcoidosis, a chronic granulomatous disease, is rarely found in the breast (1). It typically presents as a breast mass. There are no recorded cases of acute pain as the main presenting symptom. We describe two patients who presented with breast pain due to primary sarcoidosis.

Method: Two women presented to the breast clinic with severe breast pain. A 24 year old black African woman presented with 3 week history of pain associated with an enlarging breast mass. She required in-patient admission for pain relief. A 32 year old Polish woman presented with a 4 day history of breast pain associated with a rapidly growing mass and fever.

Ultrasound scans of the breasts revealed 140mm in diameter masses respectively and axillary lymphadenopathy. These areas were subjected to core biopsies.

Both of these women subsequently developed erythema nodosum on both shins.

Results: Breast biopsy histology revealed chronic inflammatory disease containing granulomata. The axillary biopsies showed reactive lymphadenopathy. The presence of erythema nodosum confirms the diagnosis of sarcoidosis.

Conclusion: We have presented two cases of an unusual presentation of sarcoidosis as acute breast pain. Although rare, it is a condition that should be considered. Its relationship with other benign and malignant breast diseases remains uncertain and the literature will be reviewed (2)(3)(4)(5)(6).

References:

P58 Case study of unusual presentation of a rare lymphoma sub-type as breast lesions
Miss Victoria Rhodes, Dr Tagredo Toma
Southend University Hospital, UK

Purpose: Educational poster of a clinical presentation of T-Cell leukaemia/lymphoma as breast lesions, illustrated with mammography, breast ultrasound and CT scan

Method & Results: A 42 year old female presented with a history of breast lumps being investigated in her own country for the last 6 months.

Biopsies had been performed, results were not given and the patient was advised to have a bilateral mastectomy.

Clinically the breasts were lumpy and oedematous, suggesting bilateral inflammatory carcinoma.

Ultrasound scan and tru-cut biopsy were performed and the patient was booked for staging with a bone scan and CT scan.

The bone scan results were normal.

The CT scan showed a large left breast mass, thickened oedematous skin and a large axillary node. It also showed two large masses within the right breast with small lymph nodes, enlarged spleen and a large 5 cm subcutaneous posterior abdominal wall mass.

Serology results: Anti-HTLV-I/II detected, Hepatitis B core and Hepatitis C antibody detected. Biopsy confirmed aggressive T cell lymphoma.

Conclusions: Although Breast lymphomas are rare and represent a fraction of Non-Hodgkin lymphomas, it should be considered in the differential diagnosis with unusual presentation. T-Cell leukaemia/lymphoma is an aggressive lymphoma linked to infection by the human T-Cell lymphotropic virus I and is more commonly found in South America, West and South Africa. The virus is acquired vertically from mother at birth. It affect adults with an average age of 58, M:F is 1:5.

Our patient is currently under the care of the haematology team and treatment had been established.

P59 Inflammatory breast carcinoma only seen on MR imaging-Case Report
Dr Daniela Soprenic, Dr Vanja Soprenic, Miss Jasna Davidovic
University Clinical Centre of the Republic of Srpska, Bosnia and Herzegovina

Background: The conventional imaging modalities including mammography and ultrasonography are of limited value in the diagnosis of inflammatory breast carcinoma (IBC), as it is difficult to delineate specific findings of the swollen dense breast. Pathological features of the retro mammary area showed marked interstitial edema and focal lymphatic involvement by tumor cells. These characteristic images obtained by MR imaging may be suggestive of IBC.

Methods and materials: A 40-year old female presented to a two-month history of pain and itching in her left breast followed by negative findings on both physical examination and ultrasonography. The newly obtained mammography images (CR mammography) were also negative, apart from a discrete increase in the density of the left breast. An additional MR breast examination was performed on a 1.5 T MR system.

POSTER PRESENTATIONS

Symposium Mammographicum Conference 2016

POSTER PRESENTATIONS
Posters: Male Breast Cancer: Is It In Our Known BRCA Carriers?
Dr Georgiana Zamfir, Dr Rachael Currie, Dr Diane Cameron, Ms Sarah Sheldon
Royal Devon and Exeter Hospital, UK

Background: Breast cancer in male population is less common than in women. BRCA gene carriers are at increased risk. Men who carry germline mutations in the BRCA2 gene have a higher risk of developing breast carcinoma than men in the general population. On the other hand, those who carry germline mutations in the BRCA1 gene may also be at a higher risk for breast carcinoma, but this association is not as well established. Are we seeing male breast cancer in our BRCA carriers?

Methods: 5 years of data from the Royal Devon and Exeter Hospital was analysed (January 2010 – December 2015). We looked at the numbers of patients who underwent assessment for suspected breast lesions who underwent core biopsy with a grade 3 ductal carcinoma of the left breast. A 69 year old male was diagnosed by core biopsy with a grade 3 ductal carcinoma of the left breast. The diagnosis of invasive ductal carcinoma was confirmed by immunohistochemistry. The patient underwent wide local excision and sentinel node biopsy. At final histology no carcinoma was found in this axillary node and no carcinoma was found in the at final histology. The radioactive hot and blue node were the same node and no carcinoma was found in this at final histology.

P60 Male Breast Cancer – Is It in Our Known BRCA Carriers?
Dr Georgiana Zamfir, Dr Rachael Currie, Dr Diane Cameron, Ms Sarah Sheldon
Royal Devon and Exeter Hospital, UK

Methods: 5 years of data from the Royal Devon and Exeter Hospital was analysed (January 2010 – December 2015). We looked at the numbers of patients who underwent assessment for suspected breast lesions who underwent core biopsy with a grade 3 ductal carcinoma of the left breast. A 69 year old male was diagnosed by core biopsy with a grade 3 ductal carcinoma of the left breast. The diagnosis of invasive ductal carcinoma was confirmed by immunohistochemistry. The patient underwent wide local excision and sentinel node biopsy. At final histology no carcinoma was found in this axillary node and no carcinoma was found in the at final histology. The radioactive hot and blue node were the same node and no carcinoma was found in this at final histology.

Results:

1. There were 100 breast cancer cases diagnosed in male patients over a 5 year period.
2. Of these cases, 10 were diagnosed in male carriers of BRCA2 mutations.
3. There were no cases of male breast cancer in male carriers of BRCA1 mutations.

Conclusion: Male breast cancer is extremely rare affecting approximately 1 in 10,000 males. Although less common than female breast cancer, there is often a delay in diagnosis due to lack of awareness. We reviewed all the cases of male breast cancer diagnosed at our institute over a 5 year period from Jan 2011 to Dec 2015. Clinical examination (P score), radiological findings (R score) were collated with histological findings. We reviewed the current guidance on male breast cancer imaging.

Methods: Retrospective analysis of all male patients referred for breast cancer in our institute over 5 years (Jan 2011 till Dec 2015). Details collected from CRIS/PACS and pathology reports.

Results: A total of 22 cases of male breast cancer were diagnosed. Most patients (n=20) had clinical examination score of P3 and above. However, 2 patients had clinical coding of P1 with history of sentinel node technique are useful for diagnostic and prognostic purposes.

References:
P64 Phyllodes Tumours: a review of clinical, radiological and pathological features
Dr Nerys Forrest1, Mrs Tracy Durkin, Dr Vidya Kumaraswamy, Miss Alison Waterworth, Dr Simon Dennis
Calderdale and Huddersfield NHS Trust, UK

Phyllodes tumours are identified following core biopsy of indeterminate (M3/U3) breast masses, or excision of presumed fibroadenomas. If the latter, excision is often without margins, increasing local recurrence risk.

Retrospective review of pathology database for phyllodes identified on core or excision biopsy between January 2008 and December 2015 examining radiological and pathological features, recurrence rate and incidence of malignancy.

41 cases of phyllodes diagnosed in eight years. Age ranged from 14-80 years and size from 11-76 mm. In 34, initial core biopsy showed either phyllodes or fibroepithelial lesion with features of phyllodes. One biopsy revealed PASH. 6 were initially fibroadenomas, excised for size or patient request, found to be phyllodes on excision. Final excision revealed benign, borderline phyllodes in 30, 2 malignant phyllodes 7 fibroadenomas, one metaplastic carcinoma and one borderline phyllodes with DCIS. Six patients had a M/U score of 4 or more, however, there were no radiological indicators to distinguish between benign and malignant tumours. In 9 patients, tumour extended to margins without re-excision. One patient has had two recurrences of benign phyllodes, each one year following surgery. On both occasions margins were involved. One patient developed an incidental gynaecomaestia or which have worrying history such as blood stained nipple discharge.

P65 Systematic review of breast lesions of uncertain malignant potential (B3 lesions) and their risk of malignancy
Dr Nerys Forrest1, Dr Simon Lowes1, Dr Elizabeth Mitchell2, Dr Maureen Twiddy2
1Newcastle Teaching Hospitals, UK; 2Leeds University, UK

Borderline breast lesions (B3 lesions) can coexist with malignancy. The magnitude of this risk varies between studies and lesion subtypes. Determining the true risk of invasive or in situ malignancy within each lesion sub type within the B3 lesion group allows risk stratification and improves management strategies.

Systematic review to determine the incidence of malignancy identified by surgical excision biopsy, following the diagnosis of a B3 breast lesion at core biopsy. We conducted a literature search (MEDLINE, EMBASE, HICM, Scopus and Web of Knowledge), identifying relevant studies between 1980 and 2014. We appraised the literature, and extracted data allowing meta analysis, determining malignancy risk for all lesions.

Searches returned 2289 citations, with 11 more identified from other sources. Duplicate and unsuitable articles were removed leaving 209 records. From these, 26 abstracts/posters/reviews and 54 full text articles did not meet inclusion criteria. Data extraction was performed from 129 studies. The table shows lesion specific malignancy rates.

<table>
<thead>
<tr>
<th>Lesion Type</th>
<th>Number of Malignant Lesions</th>
<th>Total Number of Lesions</th>
<th>Rate of Malignancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Papilloma</td>
<td>351</td>
<td>2278</td>
<td>12</td>
</tr>
<tr>
<td>ADH</td>
<td>1114</td>
<td>4031</td>
<td>27</td>
</tr>
<tr>
<td>Radial Scar</td>
<td>88</td>
<td>934</td>
<td>8</td>
</tr>
<tr>
<td>Lobular Neoplasia</td>
<td>345</td>
<td>2014</td>
<td>17</td>
</tr>
<tr>
<td>FEA</td>
<td>179</td>
<td>1413</td>
<td>11</td>
</tr>
<tr>
<td>AIDP</td>
<td>69</td>
<td>213</td>
<td>32</td>
</tr>
<tr>
<td>All B3 lesions</td>
<td>2160</td>
<td>11423</td>
<td>17</td>
</tr>
</tbody>
</table>

P66 Systematic review of papillary lesions with and without atypia and their risk of malignancy
Dr Simon Lowes1, Dr Nerys Forrest1, Dr Elizabeth Mitchell2, Dr Maureen Twiddy2
1Newcastle Teaching Hospitals, UK; 2Leeds University, UK

Papillary lesions can coexist with malignancy; however, the magnitude of this risk varies between studies and presence of atypia. As part of a larger systematic review, we analysed malignancy risk of papillary lesions with and without atypia.

Methods: Systematic review to determine incidence of malignancy identified by surgical excision biopsy, following diagnosis of a papillary lesion at core biopsy. A literature search (MEDLINE, EMBASE, HICM, Scopus and Web of Knowledge), was conducted to identify relevant studies between 1980 and 2014. Critical appraisal, data extraction and meta-analysis to determine malignancy risk for all lesions performed.

Results: Following analysis of literature searches, 41 articles identified which included data on papillary lesions. Of these, 25 articles did not specify whether or not the lesions were associated with atypia. In 16 results were reported depending on the presence or not of atypia. Overall there were 2778 papillary lesions, 351 of which were upgraded to malignancy at surgical excision biopsy (12.6 %). There were 298 lesions with atypia, from which 91 were upgraded to malignancy (30.5%) and 1162 without atypia, of which 90 were upgraded (7.8 %).

Conclusion: Studies have assessed the risk of coexisting malignancy in papillary lesions, however these are often small. This comprehensive review shows that papillary lesions, when associated with atypia on core biopsy, have a high rate of associated malignancy suggesting all papillary lesions with atypia should be considered for excision. Papillary lesions without atypia show a lower rate of associated malignancy, and could be safely managed with surveillance strategies.
has increased and improved ultrasound machines may have lead to better detection of small lesions. Some patients report long lasting pain following biopsy. Does biopsy always benefit patients? 

Method: Biopsies of U2 masses performed between November 2013 and January 2016 were prospectively recorded, along with the age of the patient and the histology result (post-surgical if excised).

Results: 237 biopsies were performed in women aged 25 to 81. 100% of patients aged 25-29 (48 cases) had a B2 result. In the 30-34 age group (54 cases) there was one B3 result and one malignancy ( incidental low-grade DCIS within an excised fibroadenoma, biopsy B2). In those aged 35 years and over, 96% of results were B2, with one malignancy ( papillary carcinoma at B3). Imaging was reviewed in all B3- B5 cases.

Conclusion: The yield for malignancy is very low in this group of patients (2/237). Strict adherence to U2 criteria and the use of new ultrasound techniques (elastography) help to avoid biopsy in some patients?

P69 Large Volume Biopsy in B3 lesions – does weight matter? Dr Nervy Forester
Newcastle Teaching Hospital NHS Trust, UK
B3 breast lesions have an associated risk of malignancy, partly due to errors from sampling size, when small volume core are used for diagnosis.

With the increasing use of large volume, vacuum assisted biopsy (VAB) for first line stereotactic biopsy, larger samples can be obtained which are more representative of the whole lesion. Does weight of biopsy samples obtained predict the risk of lesion upgrade following repeat biopsy?

Single centre, prospective analysis of B3 breast lesions diagnosed by 10G stereotactic VAB between January 2012 and December 2014. Non second line sampling by 7/8G VAB. Pathology records reviewed – initial sample weight and any malignancy at subsequent VAB recorded. Data analysed using logistic regression analysis (Stata).

Over 4 years, 395 B3 lesions identified, of which 134 were initially diagnosed using 10G VAB and went on to have a second line VAB. 10G VAB tissue weights were initially diagnosed using 10G VAB and went on to have a second line VAB. 10G VAB tissue weights were initially diagnosed using 10G VAB and went on to have a second line VAB. 10G VAB tissue weights

Initial tissue samples were <3g. Risk of malignancy underestimation in B3 lesions is partly due to errors from sampling size, when small sample is of sufficient weight, upgrade on repeat sampling is rare. Future management strategies could incorporate weight of initial 10G sample to determine whether repeat biopsy in subgroups of patients are necessary.

P70 Stereotactic guided breast microcalcifications: comparative study of cost using vacuum assisted biopsy and 14G core needle biopsy Mrs Anuma Shrestha, Dr Louise Wilkinson, Dr Rosalind Given-Wilson, Ms Judi Curtis
St Georges University Hospital, UK
Purpose: 14G Core Needle Biopsy (14G CNB) and Vacuum Assisted Biopsy (VAB) has contributed enormously to the pre-operative diagnosis of breast cancer. The aim of this study is a retrospective review of cost effectiveness of n=1585 patients who had stereotactic guided micro-calciﬁcations (MC) biopsy from April 2012 to March 2015 in a large Breast Screening Centre.

Methods: The pathological outcomes for all stereotactic guided biopsies for MC in the three years 2012-2015 were compared with all VAB (523) outcomes. Microsoft Excel (2010) was used for statistical analysis.

Results: We observed gradual increase in total number of stereotactic guided biopsies over time with a sharp decline in the proportion of diagnostic VAB between 2012 and 2015 with reduction of costs in 2014/15. Reduction in VAB numbers has not signiﬁcantly changed the outcome of needle biopsy when compared with CNB. Non-operative diagnostic rate for all ages were consistent over three years.

Non-Operative Diagnostic Rate for All Ages

<table>
<thead>
<tr>
<th>Year</th>
<th>Invasive</th>
<th>Non-invasive</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012/13</td>
<td>99.51</td>
<td>97.92</td>
<td>98.67</td>
</tr>
<tr>
<td>2013/14</td>
<td>99.30</td>
<td>97.96</td>
<td>98.96</td>
</tr>
<tr>
<td>2014/15</td>
<td>99.69</td>
<td>95.93</td>
<td>98.45</td>
</tr>
</tbody>
</table>

Case examples will be used to demonstrate the technique and potential challenges.

Conclusion: At the end of the presentation, the audience should have an insight into the value of DBT-guided biopsy over prone stereotactic guided biopsy and how to perform the procedure safely.
Conclusions: There was a highlighted deficiency within this service in same-day stereotactic biopsies at first assessment visits against recognised standard and best practice guidelines. The re-audit evidenced that the changes implemented were effective and that the service now complied with standards. The changes that have been implemented are sustainable if continually managed.

P73 Initial experiences of performing DBT guided core biopsy procedures

Mrs Lynn Gustard, Miss Suzie Cooney, Mrs Gillian Sellers, Dr Julie Cooper
York Teaching Hospital NHS Foundation Trust, UK

Interventional image guided needle core biopsy procedures are performed to achieve a non-operative definitive diagnosis, either under ultrasound, stereotactic x-ray or more recently digital breast tomosynthesis (DBT) guidance. DBT is a form of 3D imaging of the breast, a relatively new tool in breast imaging. It can improve diagnostic accuracy by decreasing the problem of overlap as it provides tomographic images of the breast, which can be viewed sequentially in mm slices (2, 3 & 4). In this unit DBT is used in conjunction with spot films at the discretion of the radiologist/consultant radiographer to further improve mass visibility and lesion classification accuracy (4&6). With increased conspicuity of lesions, DBT provides optimum visualisation of the area during core biopsy. It allows precise and quick targeting by eliminating the difficulties associated with inaccuracies in the process of triangulation encountered during stereotactic core biopsy(7).

Protocol locally recommends first line 14g core biopsy in most instances. 10G VAB is mainly used as the second line procedure following a B1, B3 or B4 biopsy in most instances. 10G V AB is mainly used as additional work up to be performed. Just under 40% of patients with implementing percutaneous vacuum assisted biopsy.

The aim of this poster is to relay our initial experiences in performing DBT guided procedures over the last 12 months in the form of a pictorial review of 3 challenging cases where the application of DBT biopsy has helped to improve patient pathway.

References:
2. NHSBSP No 69, 2010 National Health Service Breast Screening Programme (NHSBSP) publication number 69. 2010. Digital Breast Tomosynthesis. NHS Cancer Screening Programmes, Sheffield.

© 2016 The British Institute of Radiology © 2016 The British Institute of Radiology
and compared with referrals in the same time period of 2014. Electronic patient records were analysed to determine the risk profile of the patients and the outcome of any referral to clinical genetics.

Results: A 26% increase in the number of referrals was noted. All were women with a median age of 47 (range 24-72) years. The risk profile of the patients after clinical review is tabulated below:

<table>
<thead>
<tr>
<th>Year</th>
<th>Number (%)</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>131</td>
<td>10</td>
</tr>
<tr>
<td>2014</td>
<td>178</td>
<td>24</td>
</tr>
<tr>
<td>Total</td>
<td>309</td>
<td>34</td>
</tr>
</tbody>
</table>

All high risk referrals were referred to clinical genetics in line with NICE guidance of which 2% tested BRCA positive in each group.

Conclusions: The ‘Angelina Jolie effect’ led to an increase in the number of referrals of population risk women to our tertiary FH clinic with no significant increase in the detection of moderate and high risk patients.

**P77** Evaluating time to breast cancer diagnosis among screened women undergoing assessment within and outside a breast assessment centre

---

**Symposium Mammographicum Conference 2016**

---

**P78** The communication of benign biopsy results in the NHS breast screening programme

---

**Symposium Mammographicum Conference 2016**

---

**P79** Women’s experiences of mammography – a qualitative study with breast screening clients and staff

---

**POSTER PRESENTATIONS**

---

**References:**

1. Public Health Policy and Strategy Unit. PP-14 NHS public health functions agreement 2015-16
POSTER PRESENTATIONS

Symposium Mammographicum Conference 2016

P80 Investigating whether breast density is a risk factors for lower patient satisfaction after Breast Conserving Therapy

Miss Rachel O’Connor, Dr Rosa Di Micco, Dr Elizabeth O’Flynn, Mr Peter Barry, Miss Fiona MacNeill, Miss Nicola Roche, Mr Gui Gerald, Professor Nandita de Souza, Miss Jennifer Rusby

The Royal Marsden NHS Foundation Trust, UK

Background: Poor cosmetic outcome is associated with psychological morbidity (1). The BREATQ-O is a validated Patient Reported Outcome Measure designed to evaluate patient satisfaction/quality of life. Anecdotally, surgeons report that closing the defect after wide local excision is easier when the breast is denser and we therefore hypothesised that increasing breast density may be independently associated with increased scores for the satisfaction with breasts part of a larger study of outcome of breast conservation.

Methods: Ethical approval was obtained. Consecutive women who had unilateral BCS were invited to complete the BREATQ-O. Satisfaction with breast score was dichotomised by median score. Univariate logistic regression analysis was undertaken. Variables with p<0.1 were taken forward to multivariable analysis.

Results: 200 women participated. Median age was 64.7 years (IQR,55.6-71.5). Median satisfaction score was 68 out of 100 (IQR,55-80). BMI, type of axillary surgery, size of tumour on ultrasound, weight of specimen, nodal status and delayed wound healing were not significant on univariate analysis. Size on mammogram and breast density were not significant factors. On multivariate analysis, increasing BMI (>20,>20mm) were independently associated with lower satisfaction.

Conclusion: Of these women, more than half had not heard of UBS, and 90% had never seen UBS. An awareness questionnaire was given to all attendees attending breast screening, and along with a leaflet about UBS.

Results: 1917 women were asked to complete a questionnaire and 1643 did so (response of 86%). 55% had not heard of UBS, and 90% had never seen any information on it. Of the 328 women (20%) who had experienced UBS, 7% had discussed the problem with a healthcare professional. 4% reported that having UBS would prevent them attending screening.

Conclusion: Of these women, more than half had not heard of the condition, and very few had discussed it with a healthcare professional. It appears UBS would not stop the majority of women attending screening. A limitation of this study is the bias towards health conscious women attending breast screening. Further work could examine the non-attenders knowledge on UBS.

P83 NHSBSP patient dose survey 2015

Dr Jennifer Oduko, Professor Kenneth Young

NCCPM, Royal Surrey County Hospital, UK

Background: Mammographers frequently image women affected by UBS. When questioned, most women are unaware that a common cause is Intertrigo, and are unsure of treatment options. In some women, the problem is so severe; it can hamper the acquisition of high quality images and affect the overall breast screening episode.

Aim: The study aims to raise awareness of UBS in women attending breast screening, and to educate them on Intertrigo.

Methods: An awareness questionnaire was given to all women attending breast screening, and along with a leaflet about UBS.

Results: 3 patients (8%) reported persisting pain post biopsy by patients who underwent US and stereo VABB on day 1 3.4 (SD 2.8) vs 1.4 (SD 1.6)P=0.04, day 4 1.3 (SD 1.5) vs 0.2 (SD 0.6)P=0.03, day 6 0.7 (SD 0.9) vs 0P=0.03 and day 7 0.7 (SD 1.0) vs P=0.03. No procedural differences existed between the groups. 3 patients (8%) reported persistent pain at the 3-month time point, all had undergone US guided VABB.

Conclusion: Patients undergoing US guided VABB experienced more intense pain in the week following biopsy than those undergoing stereotactic guided VABB and appeared to experience more persistent pain. Further work is required to determine the cause of these findings.

P82 A study into under-breast soreness (UBS) and its impact on breast screening

Mrs Marilyn O’Connell

The Queen Elizabeth Hospital, UK

Background: Mammographers frequently image women affected by UBS. When questioned, most women are unaware that a common cause is Intertrigo, and are unsure of treatment options. In some women, the problem is so severe; it can hamper the acquisition of high quality images and affect the overall breast screening episode.

Objective: To explore what women know about UBS, what information is available and what advice mammographers could give to maximise compliance, optimise image quality and improve the overall breast screening experience.

Methods: An awareness questionnaire was given to all women attending breast screening, and along with a leaflet about UBS.

Results: 1391 women were asked to complete a questionnaire and 1283 did so (response of 89%). 55% had not heard of UBS, and 90% had never seen any information on it. Of the 326 women (20%) who had experienced UBS, 7% had discussed the problem with a healthcare professional. 4% reported that having UBS would prevent them attending screening.

Conclusion: Of these women, more than half had not heard of the condition, and very few had discussed it with a healthcare professional. It appears UBS would not stop the majority of women attending screening. A limitation of this study is the bias towards health conscious women attending breast screening. Further work could examine the non-attenders knowledge on UBS.

P84 The role of the multidisciplinary team (MDT) in developing symptomatic mammography image interpretation and reporting (MIIR) expertise

Mrs Anne-Marie Culpan, Dr Paul Marshall

University of Leeds, UK

Aim: To explore how radiographers develop expertise in symptomatic mammography image interpretation and reporting (MIIR) and gain acceptance as multidisciplinary team (MDT) members.

References:
3. The Royal Marsden Hospital, UK; 2The Institute of Cancer Research, UK

P81 Differences in acute and persistent pain following ultrasound and stereotactic guided vacuum-assisted breast biopsy (VABB) – results of a pilot survey

Dr Matthew Brown¹, Professor Nandita de Souza², Dr Elizabeth O’Flynn¹, Dr Steven Allen¹

¹The Royal Marsden Hospital, UK, ²The Institute of Cancer Research, UK


Methods: A binary logistic regression analysis was undertaken. The Royal Marsden hospital, UK.

Results: 48 49 women who had undergone US guided VABB.

Conclusions: Differences in acute and persistent pain following ultrasound and stereotactic guided vacuum-assisted breast biopsy (VABB) – results of a pilot survey

Symposium Mammographicum Conference 2016

POSTER PRESENTATIONS

POSTER PRESENTATIONS

POSTER PRESENTATIONS

POSTER PRESENTATIONS

POSTER PRESENTATIONS
Methods: Realist evaluation and qualitative methods, involving interviews and non-participant observation of clinical practice, were used to develop and test theories which explained how and why radiographers involved in symptomatic MIIR might substitute for radiologists in diagnostic breast multidisciplinary teams.

Findings: Professional roles and responsibilities were defined by organisational boundaries and cognitive ‘task-work’ knowledge and skill. Functional success in role depended on ‘social’ status within the MDT. Radiographers’ social status within the breast MDT was hierarchical. In the ‘community of practice’, social learning model, trainee and newly qualified MIIR radiographers had ‘peripheral’ membership of the MDT. Their journey to ‘active’ MDT membership involved learning to perform their role ‘better’ through sustained interaction with other team members. As radiographers displayed higher level MIIR skill and knowledge within the breast care MDT they became recognised, accepted and acknowledged as radiologist substitutes who contributed to clinical decision making. Consultant radiographers functioned as ‘core’ MDT members because they ‘proved’ they could substitute for radiologists.

Conclusion: This study highlighted the importance of ‘social’ (situated) learning in addition to cognitive learning in the development and application MIIR expertise for radiographers. Development of expertise and team contribution were inter-related radiographers achieved competent and confident MIIR through legitimate membership of, and participation in, the MDT.

Purpose: Although guidelines have been produced, there is variability within European countries regarding mammography imaging practice, and staff training. The aim of this study was to systematically synthesise evidence on European radiographers’ challenges in clinical education and practice concerning mammography.

Methodology: A systematic search was conducted in CINHAL, ERIC and MEDLINE, including qualitative and quantitative peer reviewed studies, systematic and integrative reviews, intervention or observational studies comprising Johanna Briggs Institute levels of evidence for effectiveness or meaningfulness [1]. Studies published in English language during last 5 years’ period were included (2010-2015). Investigators dual rated study quality, discrepancies were resolved through consensus.

Results: 16 papers were included in the review. Thematic analyses of selected study results produced six categories of challenges. The main challenges addressed in mammography education were: low level of knowledge (1) mainly with multiprofessional approach, image quality assessment, new technologies and competence for patient counseling. Lack of commitment and motivation (2) in taking part of training. Finally insufficient information about training opportunities and feedback on the performance (3). The main challenges addressed in clinical practice, were: good image quality (4) mainly positioning, artifact identification and removing, exposure optimization, and breast compression, as well as quality control procedure (5) and image quality assessment (6).

Conclusion: The need for training has been highlighted in this review for multiprofessional approach for breast cancer detection. Challenges in education/training and in clinical practice were observed reviling room for improvements in both areas.

References:

Method: Twenty radiographers from two Scottish breast screening units have undertaken the test set. Level of agreement with the gold standard classification and consistency between radiographers will be measured.

Intervention: Half of the radiographers then undertook the training intervention, assessing the training images and receiving immediate feedback on their decision compared with the gold standard.

Post-intervention assessment:
Following an interval of at least two weeks all radiographers then re-assessed the test set and their levels of agreement will be compared with the gold standard.

Results: The data is being analysed and results will be available for presentation, demonstrating whether the training intervention is efficacious.

References:

Purpose: Technical repeats impact on radiation dose as well as lengthening appointment time which increases screening costs. Studies have suggested that possibly 50% of original images repeated for positional errors would have been diagnostically acceptable by radiologists.

Digital Mammography enables technically inadequate images to be seen immediately and repeats taken without recalling the women. However, the emphasis on producing a technically perfect film the first time may be reduced, and the radiographer may be tempted to retake a suboptimal but diagnostically acceptable image. Training mammographers to be aware of these issues and to support accurate grading of digital image quality and appropriate decision-making on technical repeats is required.

A computer-based training intervention intended to reduce unnecessary technical repeats has been developed. The aim of this study is to investigate the validity and efficacy of the intervention and to evaluate its impact on clinical practice.

Method: Twenty radiographers from two Scottish breast screening units have undertaken the test set. Level of agreement with the gold standard classification and consistency between radiographers will be measured.

Intervention: Half of the radiographers then undertook the training intervention, assessing the training images and receiving immediate feedback on their decision compared with the gold standard.

Post-intervention assessment:
Following an interval of at least two weeks all radiographers then re-assessed the test set and their levels of agreement will be compared with the gold standard.

Results: The data is being analysed and results will be available for presentation, demonstrating whether the training intervention is efficacious.

References:

POSTER PRESENTATIONS
Symposium Mammographicum Conference 2016

P86 European radiographers challenges in mammography education and clinical practice: an integrative review
Mrs Nicole Richil Meystre1, Dr Elja Metsala1, Mr Jose Jorge3, Mrs Anja Henner2, Mrs Karollinna Paalmaaki-Paakki2, Dr Claudia Reis4

Purpose: European mammography education and clinical practice: an integrative review

Method: Twenty radiographers from two Scottish breast screening units have undertaken the test set. Level of agreement with the gold standard classification and consistency between radiographers will be measured.

Intervention: Half of the radiographers then undertook the training intervention, assessing the training images and receiving immediate feedback on their decision compared with the gold standard.

Post-intervention assessment:
Following an interval of at least two weeks all radiographers then re-assessed the test set and their levels of agreement will be compared with the gold standard.

Results: The data is being analysed and results will be available for presentation, demonstrating whether the training intervention is efficacious.

References:

POSTER PRESENTATIONS
Symposium Mammographicum Conference 2016

P87 A Breast Screening Unit CPD e-journal club: pilot introduction and evaluation
Rose Bridgewater
Northampton Breast Screening and Symtomatic Service, UK

Introduction: This poster describes the introduction and pilot of an e-journal club to meet the departmental and professional needs of practitioners at the Northampton Breast Screening Service.

Registration with the Health and Care Professions Council, the Nursing and Midwifery Council and the College of Radiographers’ accreditation scheme for Assistant and Advanced Practitioners requires mandatory Continuous Professional Development (CPD). Our department-wide (i.e. multidisciplinary) e-journal club will enable staff to satisfy this requirement. The approach is innovative because it encourages both an individual approach but also develops a community of learners.

Methods: The e-journal club will be piloted using three breast imaging and practice-related journal articles, distributed via email at two-monthly intervals accompanied by a set of critical questions. These will stimulate self-guided reflection which can be uploaded into an e-portfolio. In addition, discussion with other members of the initial study group will be encouraged.

Articles will be chosen to reflect the whole practitioner cohort, and group discussions will be enhanced by invited ‘guests’ and membership participation to engage the diverse cohort of practitioners within a broader concept of practice CPD.

The pilot will be evaluated with a questionnaire and verbal feedback using a focus group technique. The results of the pilot study will be used to further develop the e-journal club.

Conclusion: Whilst the e-journal club is still at its formative stage, early evidence suggests that this innovative approach will achieve the departmental and professional objectives whilst achieving participants’ satisfaction with this flexible approach to CPD.

References:
POSTER PRESENTATIONS

Symposium Mammographicum Conference 2016

P88 Introducing @WeMammographers into the mammography community
Mrs Cathy Hill1, Dr Claire Mercer2
1University of Salford, UK; 2University of Salford, UK

Purpose/Background/Objectives: To establish mammography as a professional group within the social media community and establish its use for continued professional development (CPD), research dissemination and education.

Methods: Within nursing the social media community is strong the @We twitter communities having continued professional development (CPD) and research dissemination and education. Herein we have explored Twitter communities in mammography.

Results: Since launch of @WeMammographers in June 2015, the site had 266 followers as far as Australia, USA and Europe. In July, a month after launch, the site had 70k impressions over the month. Key themes that have been discussed are: ‘social media awareness’, ‘communication within mammography’, ‘technique’, ‘diagnosis and treatment’. Short and long term goals include: • Regular monthly ‘topics for debate’ • Introduction of a ‘google docs’ page to track and manage twitter content • Inclusion of @WeMammographers into the educational delivery of the mammography module • Introduction of ‘tweet chats’

Conclusions: @WeMammographers has a bright future within the mammography forum as a tool for sharing best practice which can be utilised for education, CPD and dissemination of research.

P90 A mammographer-led online information service for clients invited for breast cancer screening: exploring the professional’s perspective
Dr Leslie Robinson1, Ms Cathy Hill1, Dr Marie Griffiths1, Mrs Beverley Scragg1, Mrs Shaheeda Shaikh2, Mrs Geraldine Shires1, Ms Julie Steam Hodgens1, Mrs Jo Taylor1, Ms Cathy Ure1, Dr Julie Wray1
1University of Salford, UK; 2University Hospitals of South Manchester NHS Trust, UK; 3University Hospital of South Manchester NHS Foundation Trust, UK; 4University of Salford, UK

Background: NHS information Strategy promotes the use of Social Media (SoMe) to engage online with patients in innovative ways. The WOMMeN breast screening SoMe hub has been developed in response to this strategy. The College of Radiographers has funded work to identify practitioner attitudes to the hub. One key finding has been that some practitioners feel actively discouraged from using SoMe by their Trust communication policies. This is at odds with the NHS strategy1 and the Society and College of Radiographers’ SoMe Guidelines2. We report an audit of NHS Trust policies to confirm/dispute these perceptions.

Methods: The NW of England’s breast screening programme comprises ten NHS Trusts we accessed their SoMe policies, online or from the communications team with permission. A framework analysis method was used3. After initially reading the policies, two mammographers developed a framework for more detailed analysis of content and tone. They then independently analysed the policies using the framework demonstrating a high level of agreement upon final consensus.

A framework analysis method was used3. After initially reading the policies, two mammographers developed a framework for more detailed analysis of content and tone. They then independently analysed the policies using the framework demonstrating a high level of agreement upon final consensus.

Solutions were suggested for all the barriers and participants were generally supportive of SoMe for engaging with breast screening service-users.

Conclusion: SoMe offers exciting opportunities to engage differently with breast screening clients, with the potential for reducing anxiety and improving experience. It is not without challenges however, including a need for enabling Trust SoMe communication policies and online communication skills training. A robust evaluation of the benefits of SoMe in this context is also needed to justify these recommendations.

References:
4. Harvey, N. and Holmes C. A (2012) Nominal group technique: An effective method for using online media. However, it is not clear what they feel about such a suggestion. This CoRiPS funded study explored practitioners’ perceptions of SoMe as a professional tool.

POSTER PRESENTATIONS

Symposium Mammographicum Conference 2016

Results: Across the policies there were inconsistent messages, Xing regarding patient confidentiality.

Seven Trusts were prohibitive in tone, incorporating rules and restrictions on use, three were encouraging, including guidance on how to use SoMe in a positive way. One was enabling, providing staff training.

Conclusion: Practitioners across one region receive inconsistent messages regarding SoMe. This is at odds with national strategy and professional body guidance. We maintain that this is a barrier to the use of SoMe, depriving practitioners of professional collaborative benefits and stifling innovation for patient benefit.

References:
1. Department of Health 2012 The power of information: putting all of us in control of the health and care information we need. London: DoH.

© 2016 The British Institute of Radiology

52
Conclusions: This is a feasible and important trial which will provide clinicians with valuable information to guide their future follow-up practice.

The trial team would like to acknowledge and thank all the Principal Investigators and research teams for their involvement in MAMMO-50.

Acknowledgements: Project funded by NIHR HTA programme (11/25/03). Views expressed are those of the authors and not those of the HTA programme, NIHR, NHS or the Department of health.

Introduction: For breast cancer patients 50 years and older at diagnosis, there is no evidence or consensus which will provide clinicians with valuable information to guide their future follow-up practice.

Methods: A multi-centre, randomised controlled, phase III trial of annual mammography versus 2 yearly conservation surgery for breast cancer patients over 50 years of age—the Mammo-50 study. The main reason for non-participation was that they do not wish to change their mammographic schedule.

Of patients randomised, 78% have undergone conservation, 87% have invasive disease, 82% are aged 55-75 years, 83% are ER+ve and 73% are undergoing hormone therapy. Patients most commonly enter the trial due to altruism and the main reason for non-participation is that they do not wish to change their mammographic schedule.

Results: To date (4th May 2016) 1899 patients have been randomised in 108 sites and an additional 6 sites are in set-up. The results of the feasibility phase showed that the study could recruit the required number of patients from the 100 centres. This is truly a multi-disciplinary trial with 52% of patients randomised by surgeons, 29% by radiologists and 19% by others (i.e. nurses, oncologists).

Of patients randomised, 78% have undergone conservation, 87% have invasive disease, 82% are aged 55-75 years, 83% are ER+ve and 73% are undergoing hormone therapy. Patients most commonly enter the trial due to altruism and the main reason for non-participation is that they do not wish to change their mammographic schedule.
AUTHOR INDEX

Kulama E  P13
Kumar S  P34
Kumaraswamy V  P64
Laming R  P12
Larkie A  P17
Ledwidge S  P76
Leonard M  P41
Larkou P  P49
Litton K  P37
Lloyd S  P38, P56
Longo M  P38, P56
Lotfallah A  P34
Lowes S  P65, P66
Lowry K  P37
Lucas C  P45
Lyburn I  P2*, P48
Lynn Quan M  P77
Ma V  P10
MacNeill F  8b.4, P80
Mairs W  P4
Majrzu P  P29, P77
Malghan P  P63
Marmarelis V  P49
Marshall A  P91
Marshall P  P94
Martin J  P42
Martinez L  P13
Masselie H  P2
Maxwell AJ  P91
Mazroua J  P1
McKillop A  P14
Mercer C  4.6, P4, P9*, P16, P72, P88
Meredith J  4.6
Metsali E  P98
Michel M  P71
Millington S  P44
Mirea L  P77
Mitchell E  P65, P66
Mok W  P15
Moody L  P25
Mooney T  P17, P20
Moor J  P71
Morris C  P15
Morris O  P7
Muhammad Gowd H  8b.3
Mumbai P  P85
Muradali D  P77

Roche N  P80
Roche N  8b.4
Rusby J  8b.4, P80
Russell H  P2
Sak S  P63
Salt V  P76
Saravana Kanupahla A
Sayers C  P63
Scragg B  4.6, P10, P9*, P90
Sellers G  P73
Shah S  P90
Shah S  P89
Shah S  P46
Sheldon S  P80
Shere M  P48
Shires G  4.6, P90
Shrestha A  P15, P70
Shrestha D  8b.5
Sibai N  P47
Sinclair M  P15
Softas M  P49
Soneji N  4.2
Sorensen D  P45
Sorensen P  P59
Stahneke M  4.5
Steel J  4.4
Stewart V  4.2
Sitetis B  P46
Stinton C  P19
Strudland R  8b.1
Suaris T  P38
Suaris T  P56
Swinson C  8b.5
Szczepura A  P25
Szczepura K  P4, P9
Taylor C  P4
Taylor J  4.6, P90
Taylor K  8b.1
Taylor S  P48
Taylor-Phillips S  4.3*, P19
Thome A  P43
To M  P86
To P  P23
To M  P58, P75

AUTHOR INDEX