

EUROPEAN RESPIRATORY *journal*

FLAGSHIP SCIENTIFIC JOURNAL OF ERS



Predicting adherence to continuous positive airway pressure in patients with obstructive sleep apnea syndrome through machine learning



M A Pacheco Pereira, R Ribeiro

European Respiratory Journal 2022 60: 4291; DOI: 10.1183/13993003.congress-2022.4291

Article

Info & Metrics

Abstract

Many patients with Obstructive Sleep Apnea Syndrome (OSAS) require Continuous Positive Airway Pressure (CPAP) therapy.

Despite its high efficacy, both in the short and long term, treatment through CPAP has low adherence rates, even with the technological advances in recent years.

In this study, using machine learning algorithms, we tried to predict which patients would be successful in adhering to CPAP treatment (mean ≥ 4 h per night), three months after the beginning of the treatment, through the data obtained from a multicentre public database (n=175).

After comparing six algorithms, Neural Networks (NN) was the one that showed the best results, with an f1-score of 0.71 and an AUC of 0.75, followed by Linear Regression, kNN, SVM, Naive Bayes and Random Forests.

Ten relevant characteristics were also identified for predicting adherence success: severity of OSAS, time till treatment, waist perimeter, score of FOSQ global, Apnea-Hypopnea Index, seizure diagnostic, type of sleep study (home vs. full night in laboratory vs split night in laboratory), liver disease diagnostic and score FOSQ vigilance.

It is possible to conclude that ML algorithms, properly trained in Big Data systems, may have a reasonable predictive capacity for the success of patients' adherence to CPAP, thus allowing a personalized therapy with an improvement in their quality of life.

[Treatments](#) [Apnoea / Hypopnea](#) [Personalised medicine](#)

Footnotes

Cite this article as *Eur Respir J* 2022; 60: Suppl. 66, 4291.

This article was presented at the 2022 ERS International Congress, in session “-”.

This is an ERS International Congress abstract. No full-text version is available. Further material to accompany this abstract may be available at www.ers-education.org (ERS member access only).

Copyright ©the authors 2022

We recommend

Patients Compliance: Ten Years History Data Analysis

Anzhelika Mezina et al., ERJ Open Res, 2023

Continuous positive airway pressure therapy in children with Down syndrome and obstructive sleep apnoea: outcome and predictive factors.

I Vanholder et al., European Respiratory Journal, 2022

Position trainer device for Obstructive Sleep Apnea.

J Rodriguez Sanz et al., European Respiratory Journal, 2022

Outcomes of CPAP therapy in Down syndrome – the population-based DISCOVERY study

A Palm et al., European Respiratory Journal, 2022

Impact of a multimodal telemonitoring intervention on CPAP adherence in symptomatic low-cardiovascular risk sleep apnea: a randomized controlled trial

Renaud Tamisier et al., European Respiratory Journal, 2020

Pathophysiological mechanisms and therapeutic approaches in obstructive sleep apnea syndrome

Renjun Lv et al., Signal Transduction and Targeted Therapy, 2023

Random distributed logistic regression framework for predicting potential lncRNA–disease association

Yichen Sun et al., Journal of Molecular Cell Biology, 2021

Random distributed logistic regression framework for predicting potential lncRNA–disease association

Yichen Sun et al., Journal of Molecular Cell Biology, 2021

Metabolic surgery in China: present and future

Yinfang Tu et al., Journal of Molecular Cell Biology, 2021

Metabolic surgery in China: present and future

Yinfang Tu et al., Journal of Molecular Cell Biology, 2021

Powered by **TREND MD**

I consent to the use of Google Analytics and related cookies across the TrendMD network (widget, website, blog). [Learn more](#)

Yes

No

[← Previous](#)

[^ Back to top](#)

Vol 60 Issue suppl 66 [Table of Contents](#)

- [Table of Contents](#)
- [Index by author](#)


-  [Email](#)
-  [Citation Tools](#)
-  [Request Permissions](#)
-  [Share](#)


Jump To

-  [Article](#)
-  [Info & Metrics](#)

Tweet

Gosto 0

 **More in this TOC Section**

 **Related Articles**

No related articles found.

[Google Scholar](#)

Navigate

[Home](#)[Current issue](#)[Archive](#)

About the ERJ

[Journal information](#)[Editorial board](#)[Press](#)[Permissions and reprints](#)[Advertising](#)

The European Respiratory Society

[Society home](#)[myERS](#)[Privacy policy](#)[Accessibility](#)

ERS publications

[European Respiratory Journal](#)[ERJ Open Research](#)[European Respiratory Review](#)[Breathe](#)[ERS books online](#)[ERS Bookshop](#)

Help

[Feedback](#)

For authors

[Instructions for authors](#)[Publication ethics and malpractice](#)[Submit a manuscript](#)

For readers

[Alerts](#)[Subjects](#)[Podcasts](#)[RSS](#)

Subscriptions

Accessing the ERS publications



Contact us

European Respiratory Society
442 Glossop Road
Sheffield S10 2PX
United Kingdom
Tel: +44 114 2672860
Email: journals@ersnet.org

ISSN

Print ISSN: 0903-1936
Online ISSN: 1399-3003

Copyright © 2023 by the European Respiratory Society