ERS technical standards for using type III devices (limited channel studies) in the diagnosis of sleep disordered breathing in adults and children

Renata L. Riha [1], Marta Celmina [2], Brendan Cooper [3], Refika Hamutcu-Ersu [4], Athanasios Kaditis [5], Andrew Morley [6], Athanasia Pataka [7], Thomas Penzel [8], Luca Roberti [9], Warren Ruehland [10], Dries Testelmans [11], Annelies van Eyck [12,13], Gert Grundström [14], Johan Verbraecken [15] and Winfried Randerath [16]

[1]Department of Sleep Medicine, The Royal Infirmary Edinburgh, Edinburgh, UK. [2]Epilepsy and Sleep Medicine Centre, Children's Clinical University Hospital, Riga, Latvia. [3]Lung Function and Sleep, University Hospitals Birmingham NHS Foundation Trust, Queen Elizabeth Hospital Birmingham, Edgbaston, UK. [4]Children's Hospital of Eastern Ontario, Ottawa, ON, Canada. [5]Division of Paediatric Pulmonology and Sleep Disorders Laboratory, First Department of Pediatrics, National and Kapodistrian University of Athens School of Medicine and Agia Sofia Children's Hospital, Athens, Greece. [6]Gartnavel General Hospital Glasgow, Glasgow, UK. [7]Respiratory Failure Unit, G. Papanikolaou Hospital, Aristotle University of Thessaloniki, Thessaloniki, Greece. [8]Department of Cardiology and Angiology, Interdisciplinary Center of Sleep Medicine, Charité Universitätsmedizin Berlin, Berlin, Germany. [9]Associazione Apnoici Italiani Aps, Rome, Italy. [10]Institute for Breathing and Sleep, Austin Health, Melbourne, Australia. [11]Department of Pneumology, University Hospitals Leuven, Leuven, Belgium. [12]Laboratory of Experimental Medicine and Pediatrics, University of Antwerp, Antwerp (Edegem), Belgium. [13]Department of Pediatrics, Antwerp University Hospital, Antwerp (Edegem), Belgium. [14]European Lung Foundation, Sheffield, UK. [15]Antwerp University Hospital and University of Antwerp, Edegem (Antwerp), Belgium. [16]Bethanien Hospital, Clinic of Pneumology and Allergology, Center for Sleep Medicine and Respiratory Care, Institute of Pneumology at the University of Cologne, Solingen, Germany.

Corresponding author: Renata L. Riha (rlriha@hotmail.com)

Shareable abstract (@ERSpublications)
This technical standard provides a framework for considering current type III device limitations while raising research- and practice-related questions aimed at improving our use of these devices in the present and future https://bit.ly/3KikOhS

Cite this article as: Riha RL, Celmina M, Cooper B, *et al*. ERS technical standards for using type III devices (limited channel studies) in the diagnosis of sleep disordered breathing in adults and children. *Eur Respir J* 2023; 61: 2200422 [DOI: 10.1183/13993003.00422-2022].

This article has an editorial commentary: https://doi.org/10.1183/13993003.01947-2022

Received: 25 Feb 2022
Accepted: 27 July 2022

Abstract

For more than three decades, type III devices have been used in the diagnosis of sleep disordered breathing in supervised as well as unsupervised settings. They have satisfactory positive and negative predictive values for detecting obstructive and central sleep apnoea in populations with moderately high pre-test probability of symptoms associated with these events. However, standardisation of commercially available type III devices has never been undertaken and the technical specifications can vary widely. None have been subjected to the same rigorous processes as most other diagnostic modalities in the medical field. Although type III devices do not include acquisition of electroencephalographic signals overnight, the minimum number of physical sensors required to allow for respiratory event scoring using standards outlined by the American Academy of Sleep Medicine remains debatable. This technical standard summarises data on type III studies published since 2007 from multiple perspectives in both adult and paediatric sleep practice. Most importantly, it aims to provide a framework for considering current type III device limitations in the diagnosis of sleep disordered breathing while raising research- and practice-related questions aimed at improving our use of these devices in the present and future.