



# Introduction

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OSA is a syndrome caused by recurrent episodes of partial or complete pharyngeal collapse during sleep. It is a common and progressive chronic disease that is responsible for a high number of comorbidities and it is related to an increase in mortality, including a rise in the rate of sudden cardiac death. OSA affects millions of people worldwide; it is a heterogeneous condition with distinct phenotypes, varying from lean young adults with maxillofacial abnormalities and limited IH, to obese middle aged OSA patients with metabolic syndrome, obesity hypoventilation syndrome or overlap syndrome (*i.e.* a combination of OSA and COPD). Two-thirds of HF patients exhibit CSA or OSA. OSA is highly prevalent in specific populations, such as those with hypertension, stroke, coronary heart disease and patients exhibiting arrhythmias. Sleep fragmentation and chronic IH, the markers of OSA, induce intermediate mechanisms, such as oxidative stress, sympathetic nervous system activation and systemic inflammation, responsible for symptoms and cardio-metabolic consequences.

This issue of the *ERS Monograph* begins by addressing the pathogenesis of OSA, with new insights from animal models and integrated physiology. These chapters provide new clues to understanding OSA-related cardiovascular morbidity, as well as ways of phenotyping patients for better prediction of their response to different therapeutic modalities. Leg fluid volume shift from the legs to the neck during the night, a recently demonstrated mechanism that may precipitate UA collapse, is also put into clinical perspective. Another recent hot topic is the link between OSA and cancer; the excess mortality associated with OSA has not only been attributed to cardio-metabolic consequences but also to cancer. This was first suggested in animal studies that demonstrated an association between IH, carcinogenesis and the acceleration of tumour growth; this has recently been confirmed in clinical and epidemiological studies.

The individual populations in which OSA is highly prevalent are considered in subsequent chapters. Specific diagnostic strategies are necessary because OSA recognition modifies risk stratification and requires therapeutic intervention. The authors provide state-of-the art updates on various clinical scenarios, including OSA in children, during pregnancy, in overlap and obesity hypoventilation syndromes and in patients undergoing bariatric surgery.

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Comorbidities are of major importance in OSA because they have a significant impact on healthcare use and mortality. Effective OSA treatment may represent an important target for improving cardio-metabolic risk. However, CPAP, the first-line therapy for OSA, fails to alter metabolic or inflammatory markers in obese OSA patients. This emphasises the need to offer a combination of multiple treatment modalities, including weight loss through lifestyle intervention, bariatric surgery or physical activity, and new medications for the reduction of cardiovascular risk that are specifically dedicated to OSA patients. As OSA-related comorbidities lie in different medical specialties, patients may not receive a totally integrated treatment regime due to poor collaboration across different medical services. It is necessary to establish whether an integrated, remote monitoring approach actually improves patient medical outcomes in a cost-effective manner. Telemedicine could be used not only to monitor CPAP compliance, leaks and residual events but also to record physical activity and self-measurements of BP and oximetry at home. This would allow the implementation of individually tailored therapeutic strategies. A panorama of the different therapeutic modalities and strategies together with OSA e-health are presented in the final chapters of this *Monograph*.

As editors, we hope that you will find this issue of the *Monograph* a useful overview of OSA that aids understanding of the condition and may influence your management of the disease. The chapters are well referenced and should stimulate research initiatives and new management pathways. We are very grateful to all the authors who have contributed excellent chapters to this *Monograph*.