

1st of 5 blogs, Exploring Central Sleep Apnoea and the guidelines and recommendations into identifying and reporting of CSA.

1. Central Sleep Apnoea and Its Phenotypes: Why does it Matter?

Central Sleep Apnoea and Its Phenotypes: The Importance of Screening and Treatment

Obstructive sleep apnoea (OSA) is the most common sleep disorder thought to affect 1 billion people globally, but another less common yet equally important condition is central sleep apnoea (CSA) [1].

The epidemiology of CSA is less well studied, but the prevalence of CSA is estimated to be 5 to 10% of patients with Sleep disordered Breathing (SDB) [2]. CSA is characterised by a lack of respiratory effort during sleep, leading to pauses in breathing. Unlike OSA, where the airway is physically obstructed, CSA is caused by the brain's failure to signal the muscles to breathe. In adults the criteria defining central sleep apnoea (CSA) are an apnoea-hypopnea index (AHI) of more than 5 events per hour of sleep, with more than 50% of these events being central in nature [3].

Recent research has identified several distinct phenotypes, or subtypes, of CSA that have important clinical implications. Understanding these phenotypes can help healthcare providers screen for and treat CSA more effectively.



The Six Phenotypes of Central Sleep Apnoea:

1. **Treatment-Emergent CSA:** This type of CSA develops in some patients who are being treated for OSA with continuous positive airway pressure (CPAP) therapy. The CPAP treatment can sometimes unmask an underlying central respiratory control problem.
2. **CSA Associated with Heart Failure:** Patients with heart failure are at a higher risk of developing CSA with Cheyne-Stokes Breathing (CSA-CSB), likely due to fluid shifts and changes in respiratory control during sleep.
3. **CSA Associated with Opioid Use:** Opioid medications can depress the respiratory drive, leading to the development of CSA in some patients.
4. **CSA Associated with High-Altitude Exposure:** The lower oxygen levels at high altitudes can trigger CSA in susceptible individuals.
5. **CSA Associated with Stroke:** Damage to the areas of the brain that control breathing can result in CSA in some stroke patients.
6. **Idiopathic CSA:** In this rare form, the cause of the CSA is unknown, and it is not associated with any underlying medical condition.

The Importance of Screening and Appropriate Treatment:

Recognising these different CSA phenotypes is clinically important for several reasons:

1. **Accurate Diagnosis and Treatment:** Properly identifying the type of sleep apnoea, whether obstructive or central, is crucial for determining the appropriate treatment approach. The reported prevalence of central sleep apnoea is reported at around 0.9%, while the prevalence of Cheyne-Stokes respiration is around 0.4% in the general population. In patients with heart failure, OSA is much more common than CSA. [4]. The presence of residual central hypopneas during CPAP therapy can significantly limit the treatment effectiveness, increase the risk of adverse outcomes, and require close clinical follow-up and consideration of alternative therapies, especially for patients with complex sleep-disordered breathing [5].

2. **Targeted Therapy:** Different CSA phenotypes may require different treatment strategies. For example, patients with treatment-emergent CSA may benefit from adjustments to their CPAP therapy, while those with heart failure-associated CSA may need additional treatments to address the underlying cardiac condition. Recent studies have explored the potential of various pharmacological treatments to address central sleep apnoea (CSA). These emerging therapies aim to improve upper airway (UA) muscle dysfunction, regulate loop gain (the sensitivity of the respiratory control system), and reduce excessive daytime sleepiness. The clinical trials

investigating these pharmacological interventions have demonstrated promising results, suggesting they could become valuable additions to the treatment arsenal for CSA patients [4].

3. Improved Outcomes: Appropriate screening and treatment of CSA can help prevent or manage the serious health consequences associated with this condition, such as cardiovascular problems, cognitive impairment, and reduced quality of life [5].

4. Personalised Medicine: By understanding the specific phenotype of a patient's CSA, healthcare providers can tailor the treatment plan to the individual's needs, leading to better outcomes and a more personalised approach to sleep apnoea management [3,6]. Central sleep apnoea is a complex condition with several distinct phenotypes. Recognising and properly screening for these phenotypes is crucial for ensuring that patients receive the most appropriate and effective treatment. By adopting a personalised approach to CSA management, sleep medicine clinicians can help improve the overall health and well-being of their patients.

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References

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