# Updated Guidelines from AASM for the Treatment of Central Sleep Apnea Syndromes

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**Evidence rating system used?** Yes

**Literature search described?** Yes

**Guideline developed by participants without relevant financial ties to industry?** Yes

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Central sleep apnea syndromes are characterized by sleep-disordered breathing associated with absent or diminished respiratory effort. Symptoms include excessive daytime sleepiness, frequent waking during the night, or both. This practice parameter reviews available data on the treatment of central sleep apnea syndromes in adults. The American Academy of Sleep Medicine (AASM) includes levels of recommendations (standard or option) based on the overall quality of evidence (high, moderate, low, or very low).

## Treatment of Primary Central Sleep Apnea Syndromes

*Positive airway pressure therapy may be considered for the treatment of primary central sleep apnea syndromes. (Option.)* Positive airway pressure therapy includes continuous positive airway pressure (CPAP), bilevel positive airway pressure in a spontaneous-timed mode, and adaptive servo-ventilation. Adaptive servo-ventilation is a type of closed-loop mechanical ventilation that provides a breath-by-breath adjustment of inspiratory pressure support to regulate breathing patterns relative to a preset target. Although the literature is limited, positive airway pressure therapy can improve central respiratory events without significant risks, and is readily available. The quality of evidence for this recommendation is very low.

*Acetazolamide has limited supporting evidence, but may be considered for the treatment of primary central sleep apnea syndromes. (Option.)* The overall quality of evidence for this recommendation is low. Use of acetazolamide has the potential to produce adverse effects, such as paresthesias, tinnitus, gastrointestinal symptoms, metabolic acidosis, electrolyte imbalance, and drowsiness.

*The use of zolpidem (Ambien) and triazolam (Halcion) may be considered for the treatment of primary central sleep apnea syndromes only if the patient does not have underlying risk factors for respiratory depression. (Option.)* There is limited available evidence for this recommendation. Use of these medications may produce adverse effects, such as respiratory depression, and should be considered only as a last therapeutic option if other options are unsuccessful. Close clinical follow-up is required for patients using these hypnotic agents.

## Syndromes Due to CHF, Including Cheyne Stokes Breathing Pattern and Not Cheyne Stokes Breathing

*CPAP therapy targeted to normalize the apnea-hypopnea index is indicated for the initial treatment of central sleep apnea syndromes related to congestive heart failure (CHF). (Standard.)* The overall quality of evidence for this recommendation is moderate, but with a large effect size and consistent findings for reducing the apnea-hypopnea index and improving left ventricular ejection fraction. Data show that CPAP treatment targeted to an apnea-hypopnea index less than 15 has a positive effect on transplant-free survival in ▶

patients with central sleep apnea syndromes and CHF. This treatment is readily available, and health care professionals are familiar with its use; therefore, it warrants a standard level of recommendation. If central sleep apnea syndromes caused by CHF are not controlled, other treatment options should be considered.

*Bilevel positive airway pressure therapy in a spontaneous timed mode targeted to normalize the apnea-hypopnea index may be considered for the treatment of central sleep apnea related to CHF only if there is no response to adequate trials of CPAP, adaptive servo-ventilation, and oxygen therapies. (Option.)* In the limited number of available studies, spontaneous timed mode was used more often than spontaneous mode. Bilevel positive airway pressure therapy in a spontaneous timed mode has similar advantages to CPAP (e.g., low risk, readily available). However, because of the shortage of evidence, it should be considered only in patients who do not respond to CPAP, adaptive servo-ventilation, and oxygen therapy. It also is considerably more expensive than CPAP, and it requires specialized expertise.

*Adaptive servo-ventilation targeted to normalize the apnea-hypopnea index is indicated for the treatment of central sleep apnea syndromes related to CHF. (Standard.)* The evidence for this recommendation is of moderate quality. Data show that adaptive servo-ventilation improves the apnea-hypopnea index and the left ventricular ejection fraction; however, there are no long-term or survival data available. It is difficult to generalize findings because many studies are industry sponsored, and manufacturers use different algorithms to detect respiratory events and evaluate pressure delivery. Also, there is uncertainty about the optimum settings of the devices. Although more expensive than CPAP, adaptive servo-ventilation has produced consistent data that are comparable or better than the data for CPAP.

*Nocturnal oxygen therapy is indicated for the treatment of central sleep apnea syndromes related to CHF. (Standard.)* Data show that nocturnal oxygen therapy reduces the apnea-hypopnea index and improves the left ventricular ejection fraction, although studies varied in the duration of treatment. Oxygen therapy is not superior to CPAP, but it is easily administered and may be used in persons with central sleep apnea syndromes related to CHF who cannot comply with CPAP therapy.

*Acetazolamide and theophylline have limited supporting evidence, but may be considered for the treatment of central sleep apnea syndromes related to CHF after optimization of standard medical therapy, if positive airway pressure is not tolerated and if accompanied by close clinical follow-up. (Option.)* Data supporting these agents are limited, and the balance of benefits and harms are unclear. Potential adverse effects from theophylline include cardiac arrhythmias, central nervous system excitability, and gastrointestinal symptoms. Theophylline has a narrow therapeutic index and requires close monitoring of levels.

### Syndromes Due to Other Medical Conditions: End-Stage Renal Disease

*The following possible treatment options for central sleep apnea syndromes related to end-stage renal disease may be considered: CPAP, supplemental oxygen, bicarbonate buffer use during dialysis, and nocturnal dialysis. (Option.)* The level of evidence for this recommendation is very low, and the balance of benefits and harms is unclear for any specific therapy in this population. Bicarbonate buffer is preferable during hemodialysis in these patients, although more research is needed to determine the effectiveness of the other therapies. ■

**Answers to This Issue's CME Quiz**

**Q1.** C
**Q2.** B
**Q3.** A, B, C, D
**Q4.** A
**Q5.** B, C
**Q6.** B, C, D
**Q7.** C
**Q8.** B, C
**Q9.** A, B, C, D
**Q10.** D
**Q11.** B, C, D
**Q12.** D
**Q13.** A, C