Treatment of Obstructive Sleep Apnea

Achieving Adherence to Positive Airway Pressure Treatment and Dealing with Complications

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KEYWORDS

• Obstructive sleep apnea • Positive airway pressure • Patient adherence
• Motivational enhancement therapy

KEY POINTS

- Patient education and proactive support throughout the evaluation and treatment processes are the basis for maximal adherence.
- Pharmacologic and behavioral treatment of comorbid conditions, such as sinus congestion and insomnia, should be incorporated early in the treatment course or before initiating PAP.
- Multidisciplinary care teams are instrumental for achieving optimal patient care; members should include sleep medicine physicians, midlevel providers, behavioral specialists, and durable medical equipment support.
- Technical features of PAP platforms, including variable pressure delivery, expiratory pressure reductions, integrated humidification, and more advanced settings can improve patient comfort and enhance treatment effectiveness.
- Leveraging technology and implementing frequent follow-up assessments can help analyze patterns of PAP use and identify patients needing more intensive support or targeted adherence interventions.

INTRODUCTION

Obstructive sleep apnea (OSA) is a common condition that is associated with multiple adverse consequences, including worsened health outcomes, diminished quality of life, and increased health care-related costs (**Box 1**).[1–3] The standard treatment for OSA is positive airway pressure (PAP), which has been in use since the early 1980s.[4,5] When used consistently, PAP therapy has been shown to reduce the negative health impact of many comorbid medical and psychiatric disorders.[6–8] Unfortunately, PAP adherence remains suboptimal.[9] Despite advances in both mask and PAP platform technology, which have incorporated multiple features to improve both comfort

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Sleep Med Clin ■ (2017) ■–■
http://dx.doi.org/10.1016/j.jsmc.2017.07.005
1556-407X/17/Published by Elsevier Inc.

Box 1
Complications of positive airway pressure

- Mask interface problems
  - Skin irritation
  - Skin breakdown
  - Change in dentitions
  - Mask discomfort
- Claustrophobia
- Vasomotor rhinitis
- Transient insomnia
- Dry mouth
- Aerophagia
- Central or complex sleep apnea

and the effective delivery of pressure, adherence has not improved substantially.

By any measure, the optimal treatment of OSA requires long-term behavior changes, which include sleep habits, diet and exercise, and adherence with therapeutic interventions. Poor adoption is evident throughout the continuum of care. This is particularly true of PAP. Whether this lack of adherence is unique to PAP, or reflects multiple overlapping confounders and merely highlighted because this therapy includes integrated objective measures of use, remains a source on ongoing debate. Regardless, both acceptance of and adherence to PAP therapy remains problematic. For example, up to 30% of patients fail to initiate therapy after diagnosis.[10] Of those starting therapy, approximately 25% stop within the first year, and fewer than 50% remain adherent in the long term.[11–14] Even among those who use CPAP regularly, average nighttime use is only 3.5 to 5.3 hours.[15–17]

Despite these challenges, several interventions have been shown to improve PAP use and, subsequently, improve patient outcomes. The purpose of this review is to define PAP adherence, identify and discuss current challenges faced by clinicians as they provide PAP therapy to their patients, and provide an overview of the various strategies to increase PAP use, with an emphasis on understanding, recognizing, and overcoming common barriers to care and using high-yield interventions early in the treatment course.

QUANTIFYING ADHERENCE WITH POSITIVE AIRWAY PRESSURE TREATMENT

Currently accepted insurance criteria in the United States contend that "adherent" equates to the use of PAP greater than 4 hours per night for at least 70% of nights.[15,18] Therefore, an individual only has to use PAP 86 hours per month, or 35% of the total recommended sleep time, to be considered adherent. Although many argue that this definition of adherence is grossly insufficient and most likely contributes to the limited ability of PAP to resolve both symptoms and consequences associated with OSA, the fact remains that despite using a low threshold for adherence, most patients do not achieve it. PAP use is commonly measured objectively. Although objective measures are intuitively superior to subjective reports, they do not always reflect the entire history. For PAP, adherence reports reveal the amount of time the PAP device was in use. They do not include time spent awake, nor do they record sleep without PAP. As such, they can both overestimate and underestimate sleep. In addition, these reports do not differentiate between patients who only intermittently use PAP, those who use it every night but only for part of the night, or those who use PAP during every sleep period but are grossly sleep restricted. As a result, commonly reported objective measures represent an upperbound estimate of how long PAP was worn during sleep, which is frequently an inaccurate reflection of both total sleep time and true adherence. All of these possibilities can be attributed to the persistence of symptoms, with significant variability regarding the effectiveness of PAP between each of these three scenarios. In other words, the persistence of symptoms may reflect insufficient sleep, insufficient use of PAP, limitations in the efficacy of PAP, or some combination of each. And, despite their objective nature, PAP use reports do not answer this question. Clinical assessment and results of PAP outcomes research should be interpreted with this limitation in mind.

Regardless of the limitations related to the accuracy of how PAP use is measured, there is sufficient evidence regarding the efficacy of PAP. And, it is clear that increased use leads to greater improvements in outcomes. In short, this therapy is efficacious, but its effectiveness is limited by insufficient use. Multiple studies have reported a dose–response relationship between hours of PAP use and improvements in OSA severity,[19] neurocognitive performance,[20] symptoms, and mortality.[21] Some outcomes have been shown to improve with even limited PAP use, and some seem to have a ceiling effect, where additional use may not lead to further improvements. This circumstance has contributed to the low threshold defining PAP adherence. However, improvements in other outcomes are not observed unless PAP is used for more than 6 or 7 hours per night. For