

Practice Parameters for the Treatment of Snoring and Obstructive Sleep Apnea with Oral Appliances

An American Sleep Disorders Association Report

Standards of Practice Committee of the American Sleep Disorders Association

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Summary: These clinical guidelines, which have been reviewed and approved by the Board of Directors of the American Sleep Disorders Association (ASDA), provide recommendations for the practice of sleep medicine in North America with regards to the use of oral appliances for the treatment of snoring and obstructive sleep apnea. Oral appliances have been developed for the treatment of snoring and have been applied to the treatment of obstructive sleep apnea, a syndrome associated with morbidity. Based on a review of the relevant scientific literature, the Standards of Practice Committee of the ASDA has developed guidelines describing the use of oral appliances for the treatment of snoring and obstructive sleep apnea in adults.

Key Words: Activator appliances; Orthodontic appliances, removable; Sleep apnea syndromes; Snoring.

[This position paper is referenced by square-bracketed numbers to the numbered sections in the accompanying review paper]

Snoring and obstructive sleep apnea (OSA), disorders that result from upper-airway obstruction, have been associated with excessive sleepiness, systemic and pulmonary hypertension, ischemic heart disease and cerebrovascular disease. Snoring also causes impaired social relationships. Oral appliances have been developed as alternatives or adjuncts to weight loss or sleep-position change, nasal continuous positive airway pressure (CPAP) and surgery for the treatment of upper-airway obstruction. The U.S. Food and Drug Administration has approved some of the available oral appliances for the treatment of snoring with and without OSA, even though limited data from controlled studies supporting the effectiveness and safety of these devices have been published in peer-reviewed literature.

METHODS

The Standards of Practice Committee of the American

Sleep Disorders Association (ASDA) appointed a task force to review the current role of oral appliances in the treatment of snoring and OSA. Based on the accompanying review ⁽¹⁾ and on consultation from other specialists and interested parties, the subsequent recommendations were developed by the Standards of Practice Committee and approved by the Board of Directors of the ASDA. All authors and ASDA board members completed detailed conflict of interest statements with regard to this topic. Whenever possible, the conclusions are evidence based. However, in those instances where the scientific data are absent, insufficient or inconclusive, recommendations are based on consensus opinion.

BACKGROUND

Snoring, a sign of upper-airway obstruction during sleep, affects people of all ages but is most common in overweight, middle-aged and elderly adults. The term primary snoring refers to snoring that is not accompanied by apnea, hypoventilation or excessive sleepiness. Upper-airway obstruction more significant than that of simple snor-

ing results in varying degrees of OSA, with consequent sleep fragmentation, hypoxemia or both. Secondary to the sleep disturbance and hypoxemia are signs and symptoms including, but not limited to, excessive sleepiness, fatigue, memory impairment, mood disturbance, decreased libido, social withdrawal and cardiovascular disease. Upper-airway resistance syndrome may occur when increased respiratory effort is associated with sleep fragmentation, which then leads to excessive sleepiness.

OSA and snoring are caused by anatomic airway collapse and altered respiratory-control mechanisms. Contributing structural abnormalities can include nasal-septal deviation, hypertrophied turbinates, nasal polyps, midfacial hypoplasia, lymphoidal hyperplasia, macroglossia, retrognathia, micrognathia, benign and malignant neoplasms, and retroglossal narrowing. Obesity is associated with an increased incidence of OSA and snoring. Disordered airway-control mechanisms are also involved in sleep apnea.

The aim of treatment with oral appliances includes improvement of snoring, OSA or both by one or more of the following mechanisms: mandibular repositioning, tongue advancement and alteration of palatal and mandibular position or dynamics. The accompanying review article ⁽¹⁾, which is based on the scientific information currently available, addresses the use and complications of oral appliances for the treatment of snoring and OSA.

RECOMMENDATIONS

Supported by Level V evidence, the following practice parameters are Grade C recommendations (Table) describing the appropriate use of oral appliances for the treatment of OSA in adults.

TABLE. Classification of Evidence ⁽³⁾

Grades	Levels	Study design
A	I	Randomized trials with low-alpha and low-beta errors
B	II	Randomized trials with high-alpha and high-beta errors
C	III	Nonrandomized concurrent cohort studies
C	IV	Nonrandomized historical cohort studies
C	V	Case series

Diagnosis

The presence or absence of OSA must be determined before initiating treatment with oral appliances to identify those patients at risk due to complications of sleep apnea and to provide a baseline to establish the effec-

tiveness of subsequent treatment. Detailed diagnostic criteria for OSA are available and include clinical signs, symptoms and the findings identified by polysomnography ⁽²⁾. The severity of sleep-related respiratory problems must be established in order to make an appropriate treatment decision.

Treatment objectives

a. For patients with primary snoring without features of OSA or upper-airway resistance syndrome, the treatment objective is to reduce the snoring to a subjectively acceptable level [3.0,5.0].

b. For patients with OSA, the desired outcome of treatment includes the resolution of the clinical signs and symptoms of OSA and the normalization of the apnea-hypopnea index and oxyhemoglobin saturation.

Indications

a. Oral appliances are indicated for use in patients with primary snoring or mild OSA who do not respond to or are not appropriate candidates for treatment with behavioral measures such as weight loss or sleep-position change [6.2]. Oral appliances may also be useful during the period of weight loss or adaptation to sleep-position changes.

b. Patients with moderate to severe OSA should have an initial trial of nasal CPAP because greater effectiveness has been shown with this intervention than with the use of oral appliances [9.0]. Upper-airway surgery (including tonsillectomy and adenoidectomy, craniofacial operations and tracheostomy) may also be indicated for patients for whom these operations are predicted to be highly effective in treating sleep apnea.

c. Oral appliances are indicated for patients with moderate to severe OSA who are intolerant of or refuse treatment with nasal CPAP. Oral appliances are also indicated for patients who refuse or are not candidates for tonsillectomy and adenoidectomy, craniofacial operations or tracheostomy [9.0]. The choice of treatment options, which include medical management and uvulopalatopharyngoplasty, should then be based upon the severity of the OSA, the patient's medical condition, the degree of urgency in treating the apnea and the patient's preference.

Follow-up

a. Follow-up polysomnography is not indicated for patients with either primary snoring or mild OSA unless symptoms worsen or do not resolve.

b. To ensure satisfactory therapeutic benefit, patients with moderate to severe OSA should undergo

polysomnography, or another objective measure of respiration during sleep, with the oral appliance in place after final adjustments of fit have been performed [6.3,9.0].

c. Patients with moderate to severe OSA who are treated with oral appliances should return for follow-up office visits with both the referring clinician and the dentist. These visits should occur at regular intervals to monitor patient compliance, evaluate device deterioration or maladjustment, evaluate the health of the oral structures and integrity of the occlusion, and assess the patient for signs and symptoms of worsening OSA [8.0]. Oral appliances may cause a worsening of OSA in some patients and appropriate follow-up care is therefore essential [6.3]. Intolerance and improper use of the device are potential problems for patients using oral appliances, which require patient effort to use properly. In addition, oral appliances can be rendered ineffective by patient alteration of the device. An objective reevaluation of respiration during sleep is indicated if signs or symptoms of OSA reoccur.

d. Oral appliances may aggravate temporomandibular joint disease and may cause dental misalignment and discomforts that are unique to each device [7.0]. Follow-up care by a dentist is necessary to assess the development of any of these complications.

Appliance fitting

a. Oral appliances should be fitted by qualified personnel who are trained and experienced in the overall care of oral health, the temporomandibular joint, dental occlusion and associated oral structures. The fitting of tongue-retaining devices may not require any specialized dental training, although education by and consultation with dentists is desirable.

b. Although cephalometric evaluation is not always required for patients who will use an oral appliance, appropriately trained professionals should perform these examinations when they are deemed necessary.

RECOMMENDATIONS FOR FUTURE RESEARCH

More substantial data need to be obtained for each oral appliance used for the treatment of snoring and OSA to identify the relative effectiveness, mode of action, patient characteristics most often associated with a successful outcome, appropriate follow-up and adjustment intervals, limitations, side-effects and risks ⁽¹⁾. Oral appliances may be useful for the treatment of upper-airway resistance syndrome, but data are completely lacking. This area needs further study. The efficacy of and compliance rates associated with the use of oral appliances compared to other treatments of OSA also need to be assessed in controlled trials. The cost-effectiveness in terms of fitting, follow-up, device

replacement and time lost from employment compared with other treatment modalities requires further evaluation.

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