

# Dental Sleep Medicine: Treatment of snoring and obstructive sleep apnea with oral appliances

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## Summary

Oral appliances (OAs) are indicated for use in patients with mild to moderate OSA who prefer them to continuous positive airway pressure (CPAP) therapy, or who do not respond to, are not appropriate candidates for, or who fail treatment attempts with CPAP. For patients with severe OSA, CPAP is indicated whenever possible before considering OAs. Oral appliances should be fitted by qualified dental personnel who are trained and experienced in dental sleep medicine. Follow-up polysomnography or home sleep study is needed to verify efficacy. Patients with OSA who are treated with oral appliances should return for follow-up office visits with the dental specialist at regular intervals to monitor patient adherence, evaluate device deterioration or maladjustment, and to evaluate the health of the oral structures and integrity of the occlusion. Regular follow up is also needed to assess the patient for signs and symptoms of worsening OSA. Research to define patient characteristics more clearly for OA acceptance, success, and adherence is needed.

**Keywords:** Standards of practice, snoring, obstructive sleep apnea syndrome, oral appliances, dental devices

## Introduction

Snoring and obstructive sleep (OSA) are caused in part by repetitive dynamic obstruction of the oropharyngeal airway. There is growing epidemiological and experimental evidence that OSA, and to a lesser degree snoring, are associated with a wide variety of adverse health outcomes. OSA is considered one of several potentially treatable contributors to systemic hypertension, and has been

associated with coronary artery disease, stroke, congestive heart failure, atrial fibrillation, increased motor vehicle accident rate, sleepiness, impaired quality of life, and increased mortality. Although several epidemiologic studies suggested a relationship between snoring and hypertension, cardiovascular disease, and cerebro-vascular disease, most of these studies were not able to discern the difference between primary snoring and patients with a mild variant of OSA. Nevertheless, snoring represents an important social problem, and contributes to impaired sleep quality of the bed partners of those who snore.

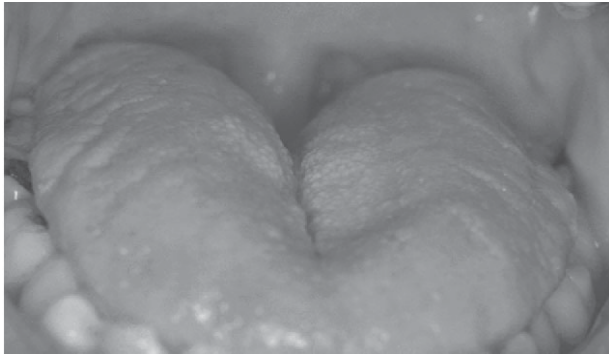
Oral appliances are increasingly used as a treatment modality for patients with OSA. In 2006, the American Academy of Sleep Medicine (AASM) published a position paper on the clinical use of oral appliances in the treatment of snoring and obstructive sleep apnea.

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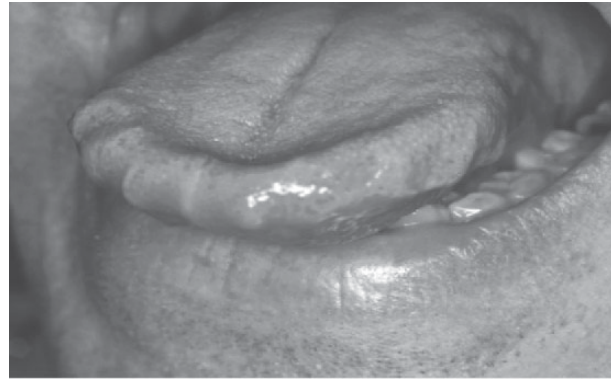
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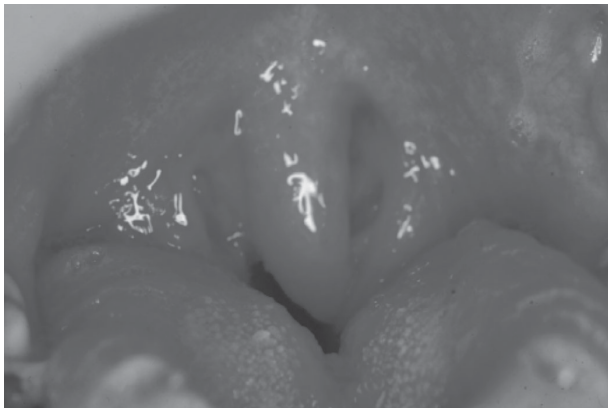
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Enlarged tongue



"Scalloped" tongue



Obstructed airway and "Scalloped" tongue



Enlarged tonsils

## Diagnosis

Dental clinics have an vital place in screening of patients with Obstructive Sleep Apnea [OSA]. Dentists can easily recognise large necks, small or recessed chins, overbite or shimbashi < 18 mms, scalloped tongues, large tongue volume, pharyngeal constriction, eroded enamel, elongated soft palate, elongated / enlarged uvula, enlarged tonsils, mandibular tori, decreased inter-molar distance with vaulted palate among others. Suspected OSA patients are referred to sleep physician for diagnostic sleep study and treatment modalities are decided depending on the severity of OSA and suitability of various treatment options for a particular patient.

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 effectiveness of subsequent treatment. Detailed diagnostic criteria for OSA are available and include clinical signs, symptoms and the findings identified by polysomnography. The severity of sleep related respiratory

problems must be established in order to make an appropriate treatment decision.

## Treatment

Dentists play an important role in the team approach to the treatment of obstructive sleep apnea. Physicians, dentists, psychologists, neurologists, ENT specialist and respiratory therapists all pool their knowledge to treat each patient appropriately and effectively. Oral appliances are worn in the mouth to treat snoring and OSA. They maintain an opened, unobstructed airway. There are many different FDA-approved oral appliances available. Oral appliance therapy [OAT] involves the selection, design, fitting and follow-up care of a custom-made oral appliance for sleep apnea treatment. Dentists trained in dental sleep medicine [DSM] are familiar with the various designs of appliances, determine which one best suits the specific needs and work with physician/ sleep specialist as part of a medical team. Initiation of oral appliance therapy can take several weeks to several months to complete. The dentist would continue to monitor treatment and evaluate the response.



Oral appliances work in several ways – repositioning the lower jaw, tongue, soft palate and uvula. Stabilizing the lower jaw and tongue and increasing the muscle tone of the tongue. Oral appliances may be used alone or in combination with other sleep apnea therapies, including weight management, surgery or CPAP.

Oral appliances should be fitted by qualified dental personnel who are trained and experienced in the overall care of oral health, the temporomandibular joint, dental occlusion and associated oral structures. Dental management of patients with OAT should be overseen by practitioners who have serious training in sleep medicine and/or sleep related breathing disorders with focused emphasis on the proper protocol for diagnosis, treatment, and follow up.

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. 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. Oral appliances are appropriate for use in patients with primary snoring who do not respond to or are not appropriate candidates for treatment with behavioral measures such as weight loss or sleep-position change. Although not as efficacious as CPAP, oral appliances are indicated for use in patients with mild to moderate OSA who prefer OAs to CPAP, or who do not respond to CPAP, are not appropriate candidates for CPAP, or who fail treatment attempts with CPAP or treatment with behavioral measures such as weight loss or sleep-position change. Patients with severe OSA should have an initial trial of nasal CPAP because greater effectiveness has been shown with this

**Effectiveness of "Mandibular repositioning devices": summary of current research**

	% Success*	Rate
Mild OSA (5-20 events/hour)	76%	41/50
Moderate OSA (20-40 events/ hour)	61%	50/82
Severe OSA (>40 events/hour)	40%	27/68

*\* Definition of success in fewer than 10 events per hour and the number of events reduced by half.*

intervention than with the use of oral appliances. Upper airway surgery (including tonsillectomy and adenoidectomy, craniofacial operations and tracheostomy) may also supersede use of oral appliances in patients for whom these operations are predicted to be highly effective in treating sleep apnea.

Follow-up sleep testing is not indicated for patients with primary snoring. To ensure satisfactory therapeutic benefit for OAs, patients with OSA should undergo polysomnography or a home sleep study with the oral appliance in place after final adjustments of fit have been performed. Patients with OSA who are treated with oral appliances should return for follow-up office visits with the dental specialist. Once optimal fit is obtained and efficacy shown, dental specialist follow-up at every 6 months is recommended for the first year, and at least annually thereafter. The purpose of follow up is to monitor patient adherence, 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. Intolerance and improper use of the device are potential problems for patients using oral appliances, which require patient effort to use properly. Oral appliances may aggravate temporomandibular joint disease and may cause dental misalignment and discomfort that are unique to each device. In addition, oral appliances can be rendered ineffective by patient alteration of the device. Patients with OSA who are treated with oral appliances should also return for periodic follow-up office visits with the referring clinician. The purpose of follow up is to assess the patient for signs and symptoms of worsening OSA. Close communication with the dental specialist is most conducive to good patient care. An objective re-evaluation of respiration during sleep is indicated if signs or symptoms of OSA worsen or reoccur.

### Suggested Reading

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