



SLEEP RELATED BREATHING DISORDERS

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A NOTE FROM THE AUTHOR

As a health care professional, I am pleased to present a contribution into the body of research and recommendations surrounding this topic.

I seek to educate and work toward a thoughtful reassessment of the role of medical and dental professionals in providing evidence-based treatment and counseling for patients. This article contains timely information and recommendations that professionals can utilize in their practice and share with their patients. In order to ensure we are offering the best care, it is important to be informed about choices, issues, products and devices that patients may be interacting with. This resource can help guide our patients using relevant resources to try to encourage an increased focus on their oral and overall health.

Signed,

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Table of Contents

Summary.....	3
Background.....	4
Diagnosis.....	4
Symptoms.....	4
Dental Examination Findings.....	5
Screening.....	5
References.....	7

SUMMARY

Studies show Americans are more tired than ever. Sleep disordered breathing is contributing to an unprecedented level of poor sleep nationally.

A 1942 Gallup poll found that adults slept an average of 7.9 hours a night. By 2013, the average adult was sleeping a half hour less than that. In 2016, the Centers for Disease Control and Prevention (CDC) reported that one third of adults fail to get the recommended seven hours of sleep a night. Major repercussions of this sleep debt are only starting to be understood. Sleep related breathing disorders are medical conditions that receive escalated attention due to associated dangers ranging from systemic diseases to fatigue-related accidents. The shortened sleep time coupled with poor sleep quality in today's world is indeed a health care crisis.

Approximately 5.9 million U.S. adults are diagnosed with sleep related breathing disorders, whereas an estimated 23.5 million cases remain undiagnosed¹. These undiagnosed cases cost our economy billions of dollars, but more importantly, increase the risk of health complications such as high blood pressure, congestive heart failure, atrial fibrillation, coronary artery disease, stroke and type 2 diabetes. Researchers are finding many associations between disrupted sleep and disease. Sleep disturbances can also be related to mental illness, Alzheimer's disease, cardiovascular disease and obesity. One of the more serious sleep problems classified as a medical disorder is Obstructive Sleep Apnea (OSA), a highly prevalent syndrome associated with deleterious medical conditions such as hypertension, stroke and congestive heart failure, as well as health concerns such as increased motor vehicle accidents and impaired quality of life^{1,2}.

Snoring is a significant social problem and contributes to decreased quality of life for bed partners through disrupted sleep³. Snoring itself may have a negative health impact, such as increased risk for cardiovascular disease.



BACKGROUND

Sleep-related breathing disorders (SRBDs) are one of six classifications of sleep disorders identified in the International Classification of Sleep Disorders, Third Edition (ICSD-3), the American Academy of Sleep Medicine's (AASM) clinical text for the diagnosis of sleep disorders⁵. Obstructive Sleep Apnea (OSA) is a SRBD associated with upper airway collapse and has an estimated prevalence of 12% (includes both diagnosed and undiagnosed). Obstructive sleep apnea increases the risk of morbidity and mortality, which underscores the need for interprofessional collaboration in diagnosing and managing this condition⁶. Diagnosis and appropriate treatment can also improve coexisting health conditions.

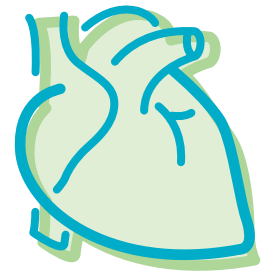
DIAGNOSIS

Due to the frequency with which patients visit oral health care providers, dental teams are on the frontline of disease detection. Information obtained from the medical history as well as the extraoral and intraoral examination can reveal obstructive sleep apnea risk factors⁷. Validated assessments can be used to screen for obstructive sleep apnea allowing referral to a medical specialist for definitive diagnosis and potential treatment. The American Academy of Sleep Medicine developed diagnostic criteria based on reported and observed symptoms, along with polysomnography recordings of hypopnea and apneic episodes⁸. Polysomnography is the gold standard for diagnosing this condition, and testing occurs at a sleep facility where sleep patterns can be observed. Physiologic data includes the number of apnea and hypopnea events that occur per cases of obstructive sleep apnea: mild ($5 \geq \text{AHI} < 15$), moderate ($15 \geq \text{AHI} < 30$), or severe ($\text{AHI} \geq 30$) events per hour. This is referred to as an apnea-hypopnea index (AHI) that establishes the severity of the condition⁹.

Hypertension and untreated obstructive sleep apnea are risk factors for stroke and myocardial infarction.

Research suggests this sleeping disorder has been found in 60% to 80% of post-cerebrovascular events¹⁰. The American Heart Association and American Stroke Association have recognized the significance of a timely obstructive sleep apnea diagnosis, which is reflected in the new guidelines.

Irregular cardiac rhythms are commonly seen in this patient population, and it has been reported to be a factor in nocturnal sudden death. Difficulty concentrating, attention deficits, dexterity issues, memory impairment, decreased cognitive processes and reduced visuomotor skills can occur, which negatively impact quality of life⁶. In addition, a correlation between periodontitis and obstructive sleep apnea exists, which is attributed to the elevated inflammatory response associated with each condition. The exact etiology of the systemic inflammation that accompanies this sleeping disorder is unclear, but research suggests it may be linked to the oral cavity and periodontal disease¹¹.



SYMPTOMS

Symptoms can manifest when the patient is sleeping or awake. Smoking can cause an inflammatory reaction of the pharynx that reduces the airway; similarly, alcohol and sedative use can reduce muscle activity, worsening the symptoms. When sleeping, affected individuals may experience nonrestorative sleep characterized by feelings of insufficient rest⁶. Individuals experiencing nocturnal symptoms are often unaware of their occurrence. Bed partners of affected individuals frequently report apnea episodes or extreme snoring resulting in their own sleep deprivation. Choking, insomnia, restlessness, unsettling dreams, gastroesophageal reflux (GERD), nocturia, drooling and excess perspiration are also



reported symptoms. Affected individuals may complain of excessive daytime sleepiness. Patients may experience morning headaches, irritability and depression from restlessness and interrupted sleep.

Cognitive deficits, difficulty focusing, and xerostomia (dry mouth) can occur⁶. Experiencing symptoms does not confirm a diagnosis, however. Appropriate testing and medical assessment are required to establish a definitive diagnosis¹².

DENTAL EXAMINATION FINDINGS

Extraoral and intraoral features of the head and neck region may be indicative of obstructive sleep apnea. These clinical presentations can be easily noted during routine assessment. Extraoral findings linked to this disorder include a large neck circumference (more than 17 inches for males and more than 15 inches for females)¹³. Frequent clinical findings include a large tongue that sits toward the tonsil region and a narrow, high-vaulted palate. These anatomical characteristics can reduce the airway passage. A narrow, hard palate can decrease nasal airflow. Additional intraoral findings include an elongated soft palate and enlarged uvula, tonsils and adenoids — features that can narrow the airway. Erosion of teeth attributed to GERD can occur, and bruxism and edentulism are also linked to this sleep disorder⁷.

SCREENING

Clinicians can use various methods to identify patients at risk for obstructive sleep apnea. These screening tools are easily adopted, simple, effective and provide rapid results. The Berlin questionnaire is composed of three sections assessing snoring, daytime fatigue and sleepiness, as well as medical history and anthropometric measurements; the STOP-BANG questionnaire (SBQ) consists of yes-or-no questions¹⁴. The subjective items evaluate snoring, tiredness, observed apnea and blood pressure (hence the acronym STOP). The Epworth Sleepiness Scale (ESS) assesses daytime sleepiness, a symptom of the disorder. It is composed of a Likert scale in which responses range from zero to three. A total ESS score of 11 or above suggests excessive daytime sleepiness and high risk¹⁶. Obstructive sleep apnea cases vary from patient to patient. After diagnosis, numerous treatment options and lifestyle changes are recommended for patient management, and therapy should be individually tailored. Continuous positive airway pressure (CPAP) is the gold standard for treatment, especially in moderate to severe cases. Use of a CPAP facemask improves quality of life, daytime sleepiness, cognitive function and blood pressure.

Although dentists cannot diagnose obstructive sleep apnea, they can become qualified to practice dental sleep medicine and play an integral role in treatment of sleep disordered breathing. In a coordinated medical-dental team approach, dentists can fabricate oral appliances to treat sleep disordered breathing. Oral appliances are the treatment option very often prescribed by physicians for mild-to-moderate cases. For a patient with a more severe case who will not use a CPAP machine, oral appliance therapy can be recommended. Most commonly used are mandibular-repositioning devices designed to hold the mandible in a forward position, enlarge the area posterior to the tongue, and reduce collapse of the pharynx and palate. Tongue-retaining devices hold the tongue in place to maintain an open airway. Numerous surgical techniques can be used to treat this patient

population, including a variety of upper airway reconstruction or bypass procedures⁹. Lifestyle modifications are geared toward risk-factor management. Dental professionals can educate patients about the role of exercise and a healthy diet for weight loss; similarly, tobacco cessation and reduced alcohol intake can lessen symptom severity. A focus on lifestyle modifications is very important in the management of patients with sleep disorders. Educating patients about risk factors, concomitant issues and treatment options is key to initiating appropriate medical care that will improve quality of life.

Dentists play an integral role in screening patients for sleep related breathing disorders and referring patients to a physician for diagnosis. When oral appliance therapy is prescribed by a physician, qualified dentists provide custom-made, adjustable oral appliances, in addition to providing diligent ongoing follow up. Dentists can obtain additional training to be able to provide effective treatment and follow-up care. Dental provider teams can work together with referrals from physician colleagues to enhance the role that dentistry plays in lessening the burden of snoring and sleep apnea on public health ^{18,19}.



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