SCREENING BY THE DENTIST

The first step for the dentist is to be able to screen for a sleep disorder, most often sleep apnea. This screening can be performed with the addition of very basic and simple questions to an existing health questionnaire, or the dental office can use the Epworth Sleepiness Scale (ESS). The ESS is a questionnaire commonly used in sleep medicine to evaluate a patient's risk for daytime sleepiness and other risk factors. A more basic set of four questions, represented by the acronym *STOP*, can be easily added to an already existing form.[4] Positive responses to two or more of the questions represent an increased risk for sleep apnea. Recently this has been expanded to the STOP-BANG questionnaire. These added four questions seem to be more definitive for determining risk for sleep apnea (**Table 1**). A recent study determined that the use of these questions was able to highly predict sleep apnea.[5] The study showed that a score of three or less had a low probability of predicting sleep apnea. However, the probability increased with a score of between three and five. If the score was greater than five, then the patient had a larger risk for having a severe sleep apnea. Essentially, if the score is zero to three, other risk factors must be considered. If the score is five or greater, the risk for severe sleep apnea increases even more. For example, if the score is eight, the probability for severe sleep apnea is nearly 82%.

Five basic questions may be easily added to those that dentists currently use when taking a health history, and may help identify the presence of a sleep disorder:

1. Do you have difficulty falling asleep or staying asleep?
2. Do you snore?
3. Are you frequently tired during the day?
4. Are you aware or have you been told that you stop breathing during sleep?
5. Is your sleep unrefreshing?

Positive responses to these questions would indicate that further evaluation is needed. At this point patients should complete the ESS and STOP-BANG questionnaires. In the presence of positive responses, patients should then be referred to their physician or a sleep medicine specialist who can further evaluate their needs.

A major concern is that the dentist may not be adequately aware or trained in sleep medicine to recognize the importance of this situation. Therefore, through asking basic questions, the possible risk may be uncovered so that the patient's situation can be adequately addressed. Unfortunately, most dentists are not well versed in sleep medicine and related disorders. One study found that a large number of dentists were not able to recognize when a patient might be at risk for sleep apnea.[6] However, this is slowly changing as more articles are appearing in professional journals read by dentists, continuing education courses are being presented in dental schools, and, in

Table 1
The STOP-BANG questionnaire

First Four Questions	Four Additional Questions
S: snore loudly	B: body mass index >28
T: feel tired during the day	A: age >50 years
O: observed/witnessed to have stopped breathing	N: neck size: male, ≥17 in; female, ≥16 in
P: high blood pressure	G: gender; are you a male
Yes to two or more above: at risk for sleep apnea	Add one or more from above: increased risk for moderate to severe sleep apnea

some cases, the predoctoral curriculum is beginning to include information about sleep and sleep disorders in some of the coursework.

Clinical Recognition of Risk for a Sleep-Related Breathing Disorder

Aside from gathering information from the health history, dentists using the ESS or STOP-BANG questionnaire must be acquainted with the clinical observations seen on a daily basis that may indicate the risk for sleep apnea. Without adequate training or awareness, the dentist may not connect these frequent findings with the risk for a sleep-related breathing disorder (sleep apnea). Recognition of these clinical findings should lead to a more detailed discussion about risk for sleep apnea, or may even lead to a more extensive examination of the oropharyngeal area in addition to the oral cavity.

The best way for those who provide oral health care, including the dental hygienist, to recognize these findings is to become familiar with the conditions that may be encountered and what these may indicate. A simplified way of correlating the clinical observations with how they may indicate a risk for sleep apnea is presented in **Table 2**.

Other sleep disorders commonly seen in practice may be uncovered by the dentist, such as in patients who present with orofacial pain or complaints of headaches who may be at risk for insomnia. Dentists will frequently treat patients for bruxism with various types of splints or appliances. The occurrence of bruxism may indicate an increased risk for restless legs syndrome or periodic limb movement disorder.[7] If a patient is found to be at risk for a sleep disorder, it is important for yhe dentist to know what additional questions to ask to confirm this and how to properly refer the patient for more definitive care.

The Detailed Evaluation

When the dentist is actively involved in the management of a patient with sleep apnea using an oral appliance, the need for a more detailed evaluation is essential. This evaluation would be adjunctive to the routine clinical data that may already exist if that individual is currently a patient of record. Regardless, the dentist must have some format for evaluating the patient to record data relevant to the treatment.

A more detailed evaluation is designed to assess a wide variety of factors in the oral cavity, head, neck, and airway. These areas may be of specific concern not only dentally but also as they relate to the oropharynx and nasal airway, because they may impact the proposed use of an oral appliance. This examination will not only evaluate the past history but also review the patient's medical status, and should involve a review of the findings from the sleep study.

Medical history and chief complaints

The process of taking a patient's medical history and chief complaints would collect information in a question-and-answer format about the patient's symptoms and concerns. This evaluation might include questions related to common symptoms of a sleep disorder, such as poor or disturbed sleep, daytime sleepiness or feeling tired, snoring, observed apneas, tooth grinding (bruxism), headaches, acid reflux (gastroesophageal reflux disease), depression, mood swings or irritability, poor concentration, and low energy levels. This evaluation would summarize the findings from a sleep study if one was performed before this visit, and might investigate the use of continuous positive airway pressure (CPAP) along with the patient's experience related to its use.

Review of the medical history

A review of the medical history would consider the patient's current medical status along with any medications being taken. At this time, the possible health consequences

Table 2
Clinical findings that may indicate a risk for sleep-related breathing disorders

Clinical Observation	Potential Relationship
Tongue	
Coated	At risk for gastroesophageal reflux disease or mouth-breathing habit
Enlarged	Increased tongue activity, possible OSA
Scalloping at lateral borders (crenations)	Increased risk for sleep apnea[23]
Obstructs view of oropharynx (Mallampati score)	I and II lower risk for OSA III and IV increased risk for OSA
Teeth and periodontal structures	
Gingival inflammation	Mouth-breather, poor oral hygiene
Gingival bleeding when probed	At risk for periodontal disease
Dry mouth (xerostomia)	Mouth-breather: may be medication-related
Gingival recession	May be at risk for clenching
Tooth wear	May have sleep bruxism
Abfraction (cervical abrasion/wear)	Increased parafunction/clenching
Airway	
Long slopping soft palate	At risk for OSA
Enlarged/swollen/elongated uvula	At risk for OSA/snoring
Red patches on posterior pharyngeal wall	At risk for gastroesophageal reflux disease or allergy
Extraoral	
Chapped lips or cracking at the corners of the mouth	Inability to nose-breathe
Poor lip seal/difficulty maintaining a lip seal	Chronic mouth breather
Mandibular retrognathia	Risk for OSA/snoring
Long face (doliocephalic)	Chronic mouth-breathing habit
Enlarged masseter muscle	Clenching/sleep bruxism
Nose/nasal airway	
Small nostrils (nares)	Difficulty nose breathing
Alar rim collapse with forced inspiration	At risk for OSA/sleep-related breathing disorder
Posture of the head/neck	
Forward head posture	Airway compromise and restriction
Loss of lordotic curve	Chronic mouth breather
Posterior rotation of the head	Tendency to mouth-breathe

Abbreviation: OSA, obstructive sleep apnea.

of the sleep disorder, and more specifically sleep apnea, may become evident. Special emphasis should be directed toward headaches, cardiovascular disease, diabetes, asthma, allergy, neurocognitive difficulties, and any medications that are being used to manage these conditions. The patient's blood pressure should also be recorded, which is common in most dental practices.