

## DIAGNOSIS

Disordered breathing is caused by a blockage of the airway. When the blockage is mild, snoring is the result. If the blockage is severe, as with severe sleep apnea, a person may stop breathing for minutes at a time before they wake up enough to gasp for air.

The blockage of the airway can occur at various points in the respiratory system. Most likely areas of blockage are:

- Enlarged nasal turbinates, deviated septum, and / or weak nasal cartilage
- Sinus blockage (allergies or infection)
- Large tonsils/adenoids
- Large tongue, uvula and/or soft palate
- Retruded lower jaw or upper jaw
- Excessive neck fat
- Smoking or second hand smoke

The gold standard for diagnosis of sleep disordered breathing is made by participating in a sleep study. This used to be available only through an inconvenient and sometimes costly overnight stay in the hospital. Today, however, there are home testing kits that a medical doctor can prescribe. These are often used as a screening tool such that if a patient has severe sleep apnea, they still may be required to have a formal sleep study in the hospital.

Diagnosis can also be made through screening Questionnaires, or subjectively by a bed partner who can hear the other person snoring, grinding their teeth, or gasping for air. It can also be made on the appearance of the teeth and face: people who most likely cannot breath through their nose will breath through their mouths, have 'long faces', have forward head posture, or swollen gums and puffy lips (see image on front panel).

## SLEEP DISORDERED BREATHING

We are in a unique position in dentistry to have the opportunity to recognize and help treat patients with airway disturbances. Maybe without realizing it, you see patients with airway obstruction on a regular basis. These patients include those who are mouth breathers, have narrow V-shaped maxillary arches, anterior open bite, or posterior cross bite. Although airway is likely obstructed at all times, it is probably most detrimental overnight during sleep.

Sleep disordered breathing is defined as sleep disturbance caused by abnormal breathing patterns. This includes snoring, upper airway resistance syndrome (UARS), and obstructive sleep apnea (OSA). These manifestations of sleep disturbances are often considered a continuum that starts with snoring and can eventually become obstructive sleep apnea if the right conditions develop (such as weight gain or sedative use).

For children with compromised nasal passages early in life causing mouth breathing, the upper jaw development is altered and narrowed because the tongue is not passively resting against the palate to create the opposing force for the cheeks. The teeth move lingually and the jaw rotates open. Lack of sleep in children can cause stunted growth, and leads to ADHD causing delayed cognitive development.

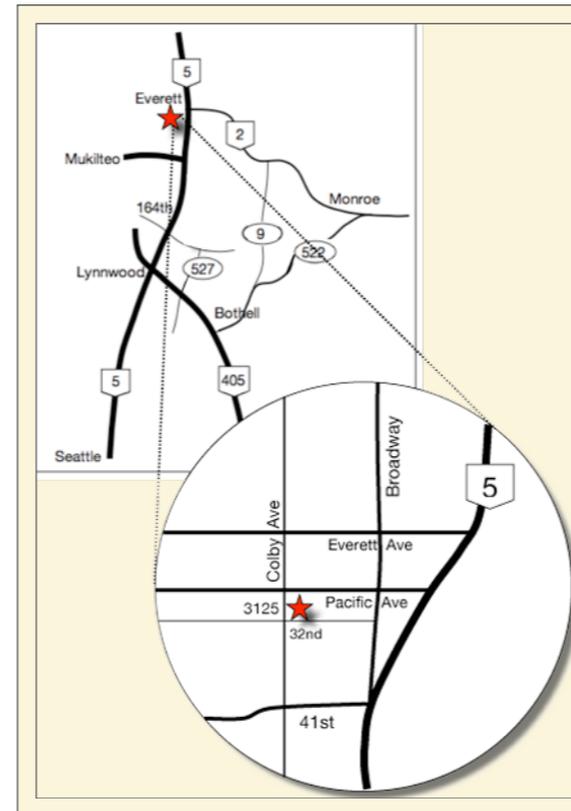
For adults, lack of sleep can increase daytime sleepiness, chronic fatigue, headaches, poor work performance, gastric reflux, sore throat, tooth wear, diabetes, hypertension, depression, heart attack, stroke and premature death.

This issue of **ProbeTips** will explore the various causes and treatments for airway compromise and its relationship to dentistry.

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# PROBE TIPS

A QUARTERLY PERIODONTAL  
NEWSLETTER

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## Airway and Dentistry



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# Types of Treatment for Sleep Disordered Breathing

## GENERAL CONSIDERATIONS

Treatment for sleep disordered breathing is determined by the level of disorder, and patient tolerance. A sleep study will classify patients into mild, moderate or severe sleep apnea versus UARS based on how many times per night breathing stops (called the apnea/hypopnea index (AHI)) and how low blood oxygen drops. An AHI of up to 5 episodes per hour is considered normal.

- Mild Apnea = AHI 6-10
- Moderate Apnea = AHI 11-20
- Severe Apnea = AHI 21+

## COMMON SENSE TREATMENTS

We often forget that our bodies are complicated machines, and that seemingly unrelated parts of our bodies have profound effects on other members.

For children, **eliminating second hand smoke or treating seasonal allergies** can be very effective at reducing the inflammation in the nasal passages that result from such insults.

One of the most obvious 'treatments' for adults is **weight loss**. Men in particular gain belly fat or neck fat that adds weight in the chest when recumbent making it harder to breathe. Improving physical activity and diet will not only reduce weight and reduce labored breathing, it will improve immune function. In addition, **avoiding alcohol, sedatives or muscle relaxants at night** (which will further reduce the muscle tone in the throat) will help ensure a better airway overnight. Sometimes, for normal weight individuals, something as simple as a **Breathe Right Strip** can open the nasal cartilage and keep air flowing through the nose.

## SURGERY

Surgical treatment is the most definitive means of correcting airway obstruction. The treatment varies depending on the location of the blockage in the airway, and your age.

For children, enlarged **tonsils and adenoids** are the most common cause of nasal obstruction and mouth breathing leading to sleep disordered breathing. Even infants can be treated surgically if the obstruction is large enough. It is often considered the first line of defense in preventing concomitant orthopedic changes in the head and face if the body adapts to obstruction during development. And, of course, if an adult has been diagnosed with enlarged glands, then surgical removal can occur at any age.

Reduction of large **nasal turbinates or deviated septum** is also a relatively non-invasive surgical treatment that can be performed even early in life in the prevention and treatment of obstruction.

If caught early enough in development, orthodontic treatment can take advantage of the potential for more extreme movements in the growing individual to move the teeth and jaws to correct positions to maximize and maintain airway space once the obstruction is removed.

Once development is completed, and craniofacial changes are 'permanent', then **orthognathic jaw surgery** to advance the maxilla or mandible or expand the palate would be necessary to correct malocclusion associated with obstruction and open airways for improved breathing.

Finally, more 'specialized' surgeries can be performed to **reduce the size of the uvula, soft palate or tongue** if all other treatments are ineffective.

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## CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP)

CPAP is considered the ideal method for treating severe sleep apnea, but can be used for more mild forms as well. CPAP is very effective for controlling sleep apnea, but is not always well tolerated. A significant number of patients can't sleep with the machine on their face, feel it is too confining, or just plain uncomfortable. CPAP machines have come a long way over the years. They are now more sophisticated so that air pressure delivered to the nose and/or mouth is regulated to be stronger when on your back, and stronger when you are breathing in. Conversely, when on your side, or breathing out, the pressure is reduced. There is also humidity control to prevent naso-oral dryness.



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With regard to dental care, these patients may have increased risk for caries or periodontitis due to oral dryness. Oral hygiene instructions for optimal home care and regular dental visits are paramount.

It is important to realize that CPAP is a treatment that does not necessarily address the cause of the apnea. If the patient is overweight or has nasal obstruction, treating those problems first may eliminate the need for a CPAP altogether. However, some types of sleep apnea, for example, central sleep apnea where the brain simply does not give the signal to the diaphragm for inhaling, would require CPAP as the main curative treatment modality.

## ORAL APPLIANCE AND MYOFUNCTIONAL THERAPY

For mild apnea, or in situations where a CPAP is not tolerated by the patient, an **oral appliance** can be fabricated. These devices are primarily used to advance the mandible forward and pull the tongue and soft tissues away from the throat to open the airway. These devices can be very effective for less severe forms of obstruction or simply to reduce or eliminate snoring not associated with sleep apnea. They are beneficial for those who cannot tolerate the CPAP, but they can never be as effective as CPAP if the apnea is severe enough.



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Occasional side effects of oral appliances include unintended tooth movement if the appliance does to cover all the teeth. Some patients may note joint tenderness or difficulty closing the teeth in the morning without the use of a re-positioning device.

Another treatment for less severe forms of airway resistance is **myofunctional therapy**, or treatment aimed at strengthening the muscles surrounding the airway to maintain patency overnight. This has been shown to improve sleep parameters even in patients with severe forms of sleep apnea.

## REFERENCES

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\*Complete references available on request.\*