

Sleep Apnea

What is sleep apnea?

Sleep apnea is a potentially serious sleep disorder that occurs when a person's breathing is interrupted during sleep. People with untreated sleep apnea stop breathing repeatedly during their sleep, sometimes hundreds of times during the night.

There are two types of sleep apnea: obstructive and central. Obstructive sleep apnea (OSA) is the more common of the two. Obstructive sleep apnea is characterized by repetitive episodes of complete or partial upper airway blockage during sleep. During an apnea episode, the diaphragm and chest muscles work harder as the pressure increases to open the airway. Breathing usually resumes with a loud gasp or body jerk. These episodes can interfere with sound sleep, reduce the flow of oxygen to vital organs, and cause heart rhythm irregularities.

In central sleep apnea (CSA), the airway is not blocked but the brain fails to signal the muscles to breathe due to instability in the respiratory control center. Central apnea is named as such because it is related to the function of the central nervous system.

What causes sleep apnea?

Obstructive sleep apnea is caused by a blockage of the airway, usually when the soft tissues in the rear of the throat collapse during sleep. Central sleep apnea is usually observed in patients with central nervous system dysfunction, such as following a stroke or in patients with neuromuscular diseases like amyotrophic lateral sclerosis. It is also common in patients with heart failure and other forms of cardiac and pulmonary disease.

What are the symptoms of sleep apnea?

Often the first signs of OSA are recognized not by the patient, but by the bed partner. Many of those affected have no sleep complaints. The most common symptoms of OSA include:

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Who gets sleep apnea?

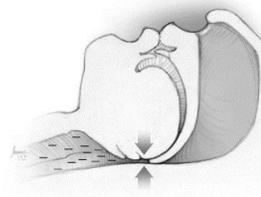
Sleep apnea occurs in about 25 percent of men and 10 percent of women. Sleep apnea can affect people of all ages, including babies and children but is particularly common in people over the age of forty and those who are overweight.

Certain physical traits and clinical features are risk factors for OSA. These include excessive weight, large neck, and structural abnormalities reducing the diameter of the upper airway, such as nasal obstruction, a low-hanging soft palate, enlarged tonsils, or a small jaw with an overbite.

The figures below illustrate the upper airway in normal sleep: (A) person is lying on back, face up, and (B) in OSA. The arrows indicate complete obstruction in the back of the throat.



A.



B.

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- Snoring
- Daytime sleepiness or fatigue
- Restlessness during sleep
- Sudden awakenings with a sensation of gasping or choking
- Dry mouth or sore throat upon awakening
- Intellectual impairment, such as trouble concentrating, forgetfulness, or irritability
- Night sweats
- Sexual dysfunction
- Headaches

People with CSA more often report recurrent awakenings or insomnia, although they may also experience a choking or gasping sensation with sudden awakenings.

Symptoms in children may not be as obvious and include:

- Poor school performance
- Sluggishness or sleepiness, often misinterpreted as laziness in the classroom
- Daytime mouth breathing and swallowing difficulty
- Inward movement of the ribcage when inhaling
- Unusual sleeping positions, such as sleeping on the hands and knees, or with the neck hyper-extended
- Excessive sweating at night
- Learning and behavioral disorders
- Bedwetting

What are the effects of sleep apnea?

If left untreated, sleep apnea can result in a number of health problems including hypertension, stroke, arrhythmias, cardiomyopathy (enlargement of the muscle tissue of the heart), heart failure, diabetes, and heart attacks. In addition, untreated sleep apnea may lead to job impairment, work-related accidents, and motor vehicle crashes as well as academic underachievement.

How is sleep apnea diagnosed?

The diagnosis of sleep apnea is relatively straightforward, based on sleep history and an overnight sleep study called a polysomnogram. This procedure is performed in a sleep laboratory under the direct

supervision of a trained technologist. During the test, a variety of body functions, such as electrical activity of the brain, eye movements, muscle activity, heart rate, breathing patterns, air flow, and blood oxygen levels are recorded at night during sleep. After the study is completed, the number of times breathing is impaired during sleep is tallied and the severity of sleep apnea is graded. In some cases, a multiple sleep latency test is performed on the day after the overnight test to measure the speed of falling asleep. In this test, patients are given several opportunities to fall asleep during the course of a day when they normally would be awake.

If you have symptoms of sleep apnea, your doctor may ask you to have a sleep evaluation in a Sleep Disorder Center.

What are the treatments for sleep apnea?

Conservative treatments: In mild cases of sleep apnea, conservative therapy may be all that is needed. Overweight people can benefit from losing weight. Even a ten percent weight loss can reduce the number of apneic events for most patients. Individuals with apnea should avoid the use of alcohol and sleeping pills, which make the airway more likely to collapse during sleep and prolong the apneic periods. In some patients with mild sleep apnea, breathing pauses occur only when they sleep on their backs.

In such cases, using pillows and other devices that help them sleep in a side position may be helpful. People with sinus problems or nasal congestion (such people are more likely to experience sleep apnea) should use nasal sprays or breathing strips to reduce snoring and improve airflow for more comfortable nighttime breathing. Avoiding sleep deprivation is important for all patients with sleep disorders.

Mechanical therapy: Continuous Positive Airway Pressure (CPAP) is the preferred initial treatment for most people with OSA. With CPAP, patients wear a mask over their nose and/or mouth and air blower forces air through the airway. The air pressure is adjusted so that it is just enough to prevent the upper airway tissues from collapsing during sleep. The pressure is constant and continuous. CPAP prevents

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airway closure while in use, but apnea episodes return when CPAP is stopped or it is used improperly. Other styles and types of positive airway pressure devices are available for people who have difficulty tolerating CPAP. These include Bilevel Positive Airway Pressure, Auto Positive Airway Pressure (AutoPAP) and Auto/Adaptive Servo-Ventilation (ASV).

Oral appliances: For patients with mild to moderate sleep apnea, dental appliances or oral mandibular advancement devices that prevent the tongue from blocking the throat and/or advance the lower jaw forward may be effective. These devices help keep the airway open during sleep. A sleep specialist and prosthodontist (with expertise in oral appliances for this purpose) should jointly determine if this treatment is best for you.

Surgery: In select cases, surgical procedures effectively reduce apnea episodes. There are many types of surgical procedures, some of which are performed as outpatient procedures. Surgery is reserved for people who have excessive or malformed tissue obstructing airflow through the nose or throat, such as a deviated nasal septum, markedly enlarged tonsils, or small lower jaw with an overbite that causes the throat to be abnormally narrow. These procedures are typically performed after sleep apnea has failed to respond to conservative measures and a trial of positive airway pressure treatment. Types of surgery include:

- **Somnoplasty:** A minimally invasive procedure that uses radiofrequency energy to reduce the soft tissue in the upper airway.
- **Uvulopalatopharyngoplasty (UPPP):** A procedure that removes soft tissue in the back of the throat and palate, increasing the width of the airway at the throat opening.
- **Maxillary/Mandibular advancement surgery:** A surgical correction of certain facial abnormalities or throat obstructions that contribute to sleep apnea. This is an invasive procedure that is usually reserved for patients with severe sleep apnea with head-face abnormalities.
- **Nasal surgery:** Correction of nasal obstructions due to nasal polyps or deviated septum.

RESOURCES:

The Cleveland Clinic Guide to Sleep Disorders
by Nancy Foldvary-Schaefer, DO

National Sleep Foundation
1522 K Street NW Suite 500
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<http://www.sleepfoundation.org/>

American Sleep Apnea Association
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