

Sleep Apnoea

Patient Information

DEFINITION — Sleep apnoea refers to the periodic cessation of air moving in and out of the lungs during sleep. Airflow must stop for an interval that is longer than the normal pause between breaths in order to be called an apnoea. This interval is usually defined as 10 seconds or more for adults.

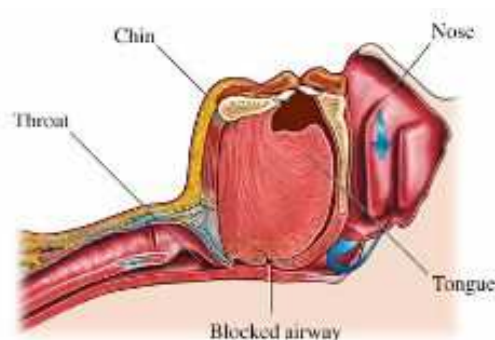
There are three basic types of sleep apnoea:

- **Central** apnoea: No air moves in and out of the lungs because the person makes no effort to breathe for a certain period of time
- **Obstructive** apnoea: The person tries to breathe, but cannot take in air because a portion of the throat is blocked
- **Mixed** apnoea: This is an event when initially there is no effort to breathe; then when the person resumes making efforts to breathe, the airway is obstructed and no air moves into the lungs.

There are also related breathing events termed hypopnea rather than apnoea. Events identified as hypopneas are those in which there is airflow into the lungs but it is abnormally reduced either because the throat is partially obstructed (obstructive hypopnea) or because the patient reduces his/her breathing effort (central hypopnea) for a certain period of time.

This topic review will focus on the most common type of sleep apnoea, **obstructive sleep apnoea (OSA)** or **obstructive sleep apnoea-hypopnea (OSAH)**.

CAUSES — OSA and OSAH are caused by abnormal closure of the airway during sleep.



The throat is surrounded by muscles that open or close the airway during speech or swallowing. These muscles are also important in allowing air to flow normally into and out of the lungs during breathing.

If these throat muscles relax inappropriately during sleep, or if the throat is abnormally small, the airway may partially close. This results in snoring and a decrease in the flow of air into and out of the

lungs. An episode of partial airway closure is called a sleep hypopnea. Complete closure of the airway results in cessation of all air movement, and is called an obstructive apnoea. A person may have both apnoeas and hypopneas during sleep.

Changes in blood oxygen and carbon dioxide levels occur when breathing is abnormal during sleep. Even if these levels change only slightly, it may be recognized by the brain that there is some interruption in normal breathing. It is also possible that the brain recognizes when more work is being done in an effort to get air into the lungs, as may occur when the throat is completely or partially blocked. This causes partial awakening (arousal) from sleep. Once a person begins to wake up, the throat muscles contract, the airway is reopened, and normal breathing resumes. This is often, but not always, associated with a loud snore or snort. The person often back to sleep quickly, usually without being aware of having awakened. Alternatively, some patients with OSA may awaken suddenly and completely with a sensation of gasping, smothering, or choking.

Once sleep resumes, the throat muscles relax, the airway closes, and the pattern repeats itself. The period of apnoea or hypopnea may last a minute or more and this cycle can occur hundreds of times in a single night. In this way, OSA and OSAH cause numerous interruptions in sleep, and may result in significant sleep disruption and deprivation. This is true even if the person is not aware of these frequent interruptions. In addition to poor quality sleep, OSA and OSAH may be associated with increased risk for, or worsening of common heart problems.

It is likely that OSA and OSAH occur because of structural or functional abnormalities in the throat. The condition is more common in men than women, and is often associated with obesity. OSA is a common disorder. It is estimated that more than 5% of adult men and 2.5% of women may have some signs of sleep apnoea. OSA is a chronic condition, but many treatments are available. Treatment helps patients sleep without interruption and feel more rested. Treatment may also decrease the risk of certain types of heart disease.

SYMPTOMS — The main symptoms of OSA and OSAH are loud snoring and severe daytime sleepiness. However, a person can have these conditions and not be aware of either of these symptoms. For example, if the person does not have a bed partner, he or she may not be aware of the snoring. Sleepiness can also come on gradually and build up over time to the point where the person accepts it as normal.

Other symptoms include:

- Restless sleep
- Awakening with choking, gasping, or smothering
- Awakening with chest pain or discomfort
- Morning dry mouth or sore throat
- Morning confusion
- Morning headaches
- Personality change
- Memory impairment, difficulty concentrating
- Impotence
- Frequent awakenings to urinate

In addition, patients with high blood pressure have an increased risk of having OSA, particularly if they are overweight.

DIAGNOSIS — A healthcare provider may suspect sleep apnoea based upon a patient's symptoms. The patient's neck circumference may be measured, as large neck size is associated with increased risk of sleep apnoea. If a bed partner has observed the patient during episodes of choking or gasping in the night, this also raises the suspicion these conditions are present. However, the diagnosis can be established with certainty only by testing the patient during sleep.

Patients with OSA are usually referred to a sleep laboratory for a full sleep study using a polysomnogram. The polysomnogram measures:

- Blood oxygen level
- Heart rate and electrocardiogram (ECG)
- Breathing effort and airflow
- Duration of the various stages of sleep
- Body position
- Limb movement

Some devices can be used at home to gather the same information as a polysomnogram performed in a sleep laboratory. Whether home studies provide the same quality of information studies performed in a sleep laboratory is the subject of ongoing research. Other types of sleep studies provide less data. The appropriate use of these more limited studies has not been clearly defined.

RISKS — Aside from feeling tired, complications attributed to OSA and OSAH include poor concentration. Studies have shown that patients with severe OSA/OSAH are more than twice as likely to be involved in a motor vehicle accident than people without these conditions.

In addition, there is some evidence that untreated OSA/OSAH is associated with an increased risk for cardiovascular problems such as high blood pressure, heart attack, abnormal heart rhythms, or stroke. This increased risk may be due to the wide fluctuations in heart rate and blood pressure observed in patients with OSA/OSAH during sleep. However, further research is needed to clearly document whether sleep apnoea contributes to any of these problems.

TREATMENT — Treatment can be generally divided into non-surgical and surgical approaches.

Non-surgical treatment — A number of non-surgical therapies may be recommended:

Behavioral treatments — Changes in lifestyle and habits may reduce the severity of OSA/OSAH. For example, weight reduction may be helpful in overweight patients with OSA/OSAH; however, the degree of weight reduction required to reduce or eliminate these conditions varies.

Some patients benefit from restriction of body position by sleeping exclusively on their side or with the head of the bed elevated. Since alcohol may promote throat closure during sleep, it should be avoided. In addition, OSA/OSAH may be worsened by certain prescription medications, irritation of the upper airway, and high altitude.

People with OSA/OSAH should always be certain that their healthcare provider is aware of their condition in order to avoid medications which may make throat closure more likely, or at least so the potential risks and benefits can be determined. Behavioural treatments do not always have a curative effect, and additional treatment is often necessary. For this reason, it is important that a person who thinks they have sleep apnoea discuss the problem with their healthcare provider, rather than trying to manage it themselves.

Continuous positive airway pressure (CPAP) — The main non-surgical treatment for OSA/OSAH is the use of a mechanical device to keep the upper airway open during sleep. A CPAP machine supplies air under relatively low pressure through a mask that fits on the nose, or over the nose and mouth. Devices which fit comfortably into the nasal opening, rather than over the nose, are also available. Patients should use CPAP whenever they sleep.

The CPAP device may be used for the first time in the sleep lab, where a technician can adjust the pressure needed to keep the airway from closing. Most patients are able to tolerate CPAP, especially if the mask fits comfortably. Once treatment with CPAP begins, the improvement in alertness and other benefits is often rapid.



Other devices — Other mechanical devices may be useful in some patients. These devices are typically oral appliances and function by holding the lower jaw or tongue forward during sleep.

Surgical treatment — Tracheostomy, the insertion of a breathing tube directly into the throat, was the first treatment used in OSA/OSAH. It was successful because it created a continuously open airway. Tracheostomy requires patients to undergo the risk of an operation, side effects, cosmetic factors, and lifestyle changes. For these reasons, tracheostomy is reserved for patients with severe disease in whom less drastic measures have failed or are inappropriate.

Other surgical procedures, which involve reshaping the structures in the upper airways or surgically repositioning the jaw, may be helpful in some patients.

WHERE TO GET MORE INFORMATION — Your healthcare provider is the best source of information for questions and concerns related to your medical problem. Because no two patients are exactly alike and recommendations can vary from one person to another, it is important to seek guidance from a provider who is familiar with your individual situation.

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