



*"When you can't breathe...
nothing else matters"*

What is obstructive sleep apnoea?

People who suffer from Obstructive Sleep Apnoea (OSA) reduce or stop their breathing for short periods while sleeping. This can happen many times during the night. These breathing stoppages interrupt sleep which results in poor sleep quality with excessive sleepiness during the day. Because these events occur during sleep, a person suffering from OSA is usually unaware of them and is often the last one to know what is happening.

In deep sleep, the muscles of the throat relax and this may reduce the space at the back of the tongue, through which air must pass to reach the lungs. Normally this doesn't cause any problems with breathing. In OSA, however, complete relaxation of the throat muscles may cause blockage of the upper airway so that breathing stops temporarily. Such an episode is called an apnoea. During an apnoea, people with OSA make constant efforts to breathe through their obstructed airway. With no passage of air into the lungs, the blood oxygen level begins to fall. This signals the brain to rouse the person from deep relaxed sleep so that the muscle tone returns, the upper airway reopens and breathing begins again. Unfortunately, when a person with OSA falls back into deep sleep, the muscles again relax and the cycle repeats itself again and again overnight.

In OSA, the apnoeas can last for ten or more seconds and the cycle of apnoeas and broken sleep is repeated hundreds of times per night in severe cases. Most sufferers are unaware of their disrupted sleep but awaken unrefreshed, feeling tired and needing more sleep.

Who gets OSA?

Whilst OSA is more common in overweight middle-aged men who snore, it can also affect women. Female hormones and a difference in throat structures may protect women until menopause. Narrowing of the throat and the upper airway can also contribute to the risk of getting OSA even in people who are not overweight or middle-aged. In such people, a blocked nose, small jaw, enlarged tongue, big tonsils or uvula may contribute to blockage of the upper airway in deep sleep, making OSA more likely.

The use of alcohol, sleeping tablets and tranquillisers prior to sleep tends to worsen OSA by further relaxing the upper airway muscles. In addition, alcohol can reduce the brain's response to apnoea, which may increase the duration and severity of apnoea events or may cause obstructive sleep apnoea in an individual who would otherwise only snore.

Most people with OSA snore loudly and breathing during sleep may be laboured and noisy. Sleeping partners may report multiple apnoeas lasting up to 90 seconds which often end in deep gasping and loud snorting. Sufferers may report waking for short periods after struggling for breath. OSA is often worse during deep sleep or when the person sleeps lying on their back.

What are the symptoms of OSA?

Although a person with OSA may not be aware of the many arousals from deep sleep, the sleep disruption may result in a perception of poor quality sleep despite long periods of time spent in bed. Such people wake feeling that they haven't had a full refreshing night's sleep. They report difficulty maintaining concentration during the day, have a poor memory, and suffer from excessive daytime sleepiness.

An OSA sufferer may be sleepy only when seated and relaxed, e.g. watching TV, but with more severe

sleep apnoea, sleepiness becomes more pervasive during the day so that car and workplace accidents may occur.

Other symptoms of OSA include morning headache, depression, short temper, grumpiness, personality change, loss of interest in sex, and impotence in males.

What other problems can develop from OSA?

OSA can be life-threatening. It is a risk factor for high blood pressure, heart attack, heart failure, and stroke. All these conditions occur more frequently in people with OSA.

OSA-associated poor concentration and daytime sleepiness have been associated with an increased risk of accidents in the workplace and on the road. Motorcar accidents have been shown to be two to five times more common in people with OSA than in other people.

How is OSA assessed?

In a person suspected of having OSA, their doctor will need to ask questions about waking and sleeping habits. Reports from the sleeping partner or other household members about any apnoeas are extremely helpful.

Referral to a sleep disorders specialist and an overnight sleep study will assist with the diagnosis of OSA and measurement of its severity.

During a sleep study, sleep quality, quantity and breathing are measured by a computer overnight while the person sleeps. Small coin-sized electrodes are attached to special points on the scalp, face, chest and legs. There are also chest and stomach bands to detect breathing movements and a sensor placed on the upper lip to measure airflow. The oxygen level in the blood is assessed by a device placed on the finger or the ear-lobe. The wires and probes are generally not painful or uncomfortable, but may feel unfamiliar or restrict movement during the night's sleep. Although patients often worry that the recording equipment will interfere with sleep, usually the information obtained is sufficient to make a diagnosis.

Sleep studies can be performed at home or under supervision in a sleep laboratory. More than one overnight study may be needed. The first is to measure what is going on, and the second is to start treatment if needed.

How is OSA treated?

The chosen form of treatment depends on the severity of OSA and patient factors.

General guidelines

In an overweight person, weight loss is an important part of treatment. Even a small loss of weight can lead to improvement in symptoms of OSA.

Avoiding alcohol up to two hours before going to sleep and not using any sleeping tablets or tranquillisers can also help.

Nasal obstruction may respond to nasal decongestant sprays and smoking cessation.

For the patients whose sleep apnoea is worsened by lying on their back, positioning devices such as special pillows, rubber wedges and tennis balls attached to pyjama backs encourage sleep in other positions but are of limited value in very severe OSA.

Specific treatments

Continuous positive airway pressure (CPAP)

A CPAP pump is the commonest treatment for OSA and is very effective in many cases. A CPAP pump

delivers air to the upper airways via a plastic tube attached to a soft silicon close-fitting nose mask. During sleep, the pump provides air at sufficient pressure to keep the upper airway from obstructing. This form of treatment is ideal for moderate to severe OSA. A small exhalation port built into the mask allows carbon dioxide to escape. CPAP prevents snoring and disrupted sleep, improves sleep quality and reduces daytime sleepiness.

Warming the air with special humidification units attached to the CPAP pump may make CPAP more tolerable. Newer CPAP units that vary their pressure across the night are now available and may help some patients who have trouble adjusting to standard CPAP therapy. The use of either of these options should be discussed with your sleep disorder specialist beforehand.

A second overnight study may be needed to determine the correct pressure setting. After this, a CPAP machine can be rented or purchased. CPAP pumps have a built in memory card which records several variables and is useful for your doctor to decide how best to manage you. In some states there may be a subsidy for CPAP treatment, and some health insurance companies may assist with the cost of a machine.

Other non-surgical treatments

Following assessment by a sleep disorder specialist, individually designed oral appliances or mouth splints made by dentists may help patients with snoring or apnoea. By holding the jaw forward in relation to the upper teeth, these “mandibular advancement splints” can reduce the severity of snoring and apnoea in selected patients with healthy teeth, when worn during sleep. Tongue retainer devices may be useful in those who no longer have their own teeth and expansion of the maxilla (the bone to which the upper teeth are connected) with specially designed ‘mouth plates’ may help patients who have a narrow maxilla. A narrow maxilla is thought to predispose to snoring, particularly in the young. In these cases, close cooperation between a sleep disorder specialist and a dentist is recommended.

Surgery

Weight loss surgery (bariatric surgery) can be useful in alleviating obesity and thereby reducing or curing some obesity related conditions such as diabetes and sleep apnoea. Although many patients having this type of surgery will achieve a significant decrease in weight, it may not be enough to stop them snoring completely.

Surgery to the upper airway may ease some of the structural problems that contribute to airway blockage during sleep. These operations include:

1. Removal of tonsils and adenoids: this is far more common in children than adults and can have excellent results.
2. Nasal surgery to improve nasal airflow: this includes removal of nasal polyps, reduction of swollen turbinates and correction of a deviated nasal septum. Such operations improve nasal airflow and enable nasal CPAP to work more efficiently.
3. Uvulopalatopharyngoplasty (UPPP): this involves removal of excess tissue at the back of the throat which may contribute to upper airway obstruction during sleep. A surgical scalpel or a laser may be used. There is no doubt that a UPPP helps snoring in some people without OSA. Unfortunately, UPPP rarely cures OSA, and it is difficult to predict those patients with OSA who will be helped by it as most of the upper airway obstruction occurs behind the tongue. Thus, in many patients with OSA who have a UPPP, the snoring might improve, but the sleep disruption, apnoeas and falls in blood oxygen associated with OSA may be ongoing.
A follow up sleep study is thus essential to measure the results. If UPPP is unsuccessful, this does not prevent nasal CPAP from being used subsequently.
4. Tracheostomy: this is an operation that has been used in the past to create a hole in the windpipe to overcome upper airway obstruction. It is rarely performed for OSA these days.

5. Corrective surgery for jaw or hard palate deformity: in a very few patients with OSA, major surgery to re-align the bony structures of the lower and mid-face may be helpful.

New pharmacological and device treatments

There is ongoing active research evaluating potential new treatments for OSA using a tablet, spray or pacemaker to help keep the upper airway open during sleep. To date, no such specific treatments have been proven effective, safe and reliable, but research continues.

In the meantime, mechanical treatments like nasal CPAP, oral appliances and weight loss remain our most effective treatments for OSA.

What is it like using a CPAP machine?

Many people with OSA who begin treatment with CPAP report that they haven't slept so well for years. They state that they feel 'normal' again and many are astounded at the improvement in their day-to-day lives. At first, using a CPAP mask may feel strange. It may feel as though unaccustomed effort is needed to breathe out. This sensation soon wears off. During the first week, nasal stuffiness and sneezing may occur, especially in colder weather. It often improves with warming the bedroom at night or using a humidifier with the CPAP machine.

Occasionally, an air leak from around the nasal mask can irritate the eyes and air leak through the mouth can cause a dry mouth. Alternative masks or a chin strap may be needed to overcome this problem. Specialised staff in sleep disorder centres throughout the country can assist when problems occur.

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