

# Sleep Apnoea

The most common forms of sleep apnoea are normally referred to as obstructive sleep apnoea (OSA) and relate to a condition which causes interruptions in breathing during sleep.

People with obstructive sleep apnoea usually suffer one of two types of interruptions to breathing:

\* **Apnoea:** during an apnoea, the muscles in the throat relax and cause a total obstruction within the throat's airway. An apnoea usually lasts for around 10 seconds.

\* **Hypopnoea:** a hypopnoea is a partial obstruction within the airway, which halves the amount of oxygen that is taken into the body. As with an apnoea, hypopnoea also usually last for around 10 seconds. Hypopnoea is often referred to as a syndrome.

*The term 'obstructive' is used to distinguish OSA from rarer forms of sleep apnoea, such as Central Sleep Apnoea, which is caused by the brain 'forgetting' to breathe during sleep.*

## What happens?

People with OSA may experience repeated episodes of both apnoea and hypopnoea during the night. The lack of oxygen causes a person to come out of deep sleep either into a lighter stage of sleep or into full wakefulness. This is a natural reaction to restore their normal breathing. However, once they fall back into deep sleep further episodes of apnoea and hypopnoea can occur.

These repeated interruptions to sleep caused by OSA can lead to tiredness and lethargy during the day. They will usually have no memory of any episodes of OSA and are often totally unaware that they are not getting a proper night's sleep.

## Who suffers from OSA?

OSA is a relatively common condition that in the UK is estimated to affect about 3.5% of men 1.5% of women. Whilst it can affect people of all ages, including children, it is most common in people aged 40 or over.

Being over weight or obese is a significant risk factor because excessive body fat can place strain on the muscles in the throat.

## How serious is OSA

Someone with OSA often suffers from a lack of proper sleep so their risk of being involved in a life-threatening accident, such as a car crash, is increased.

There is also some evidence to show that those with OSA are at greater risk of developing high blood pressure (hypertension), and thus at risk of a heart attack or stroke, though this is a common health risk for many people who are obese.

Research has shown that someone who has been deprived of sleep due to OSA has the same impairment in judgement and reaction time as someone who is over the drink-drive limit.



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Normal - Airway Clear



Apnoea - Airway Blocked



Hypopnoea - Airway Partially Blocked

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## Symptoms

Most people with obstructive sleep apnoea (OSA) will snore loudly. Their partners may notice that their breathing is laboured and noisy, and when they experience an episode of apnoea, often interrupted by gasping and snorting.

Most people with OSA have no memory of their sleep being interrupted but they wake feeling that they have not had a decent night's sleep.

Over time, the repeated interruptions to their sleep will lead to the symptoms of sleep deprivation. These include:

- \* feeling excessively sleepy during the day,
- \* poor memory and concentration,
- \* headaches; particularly in the morning,
- \* irritability and short temper,
- \* depression,
- \* lack of interest in sex, and
- \* in men, impotence (inability to get or maintain an erection).

Some people with OSA may also find that they wake up frequently during the night in order to urinate.

## Causes

Obstructive sleep apnoea (OSA) is caused by the muscles in the back of your throat relaxing during sleep. These muscles support your tongue, tonsils and soft palate (a muscle at the back of the throat used in speech).

Once the muscles relax, the airway in your throat can narrow or become totally blocked. This interrupts the oxygen supply to your body which triggers a natural reaction where your brain pulls you out of deep sleep so that your airway can be reopened and you can breathe normally.

You need to have a certain amount of deep sleep for both your body and your mind to be fully refreshed. Having limited episodes of deep sleep will lead to you feeling very tired the next day.

Most adults require at seven to eight hours of sleep to function at their best and 50% of that time should be spent in the deepest phase of sleep.

## Risk factors

\* Obesity - the more obese you are, the higher the risk. For example, a 10% increase in your weight will lead to a six-fold increase in your risk of developing OSA.

\* Being male - the reasons why OSA is more common in men than in women are unknown.



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- \* Being 40 years of age or over.
- \* Having a large neck - people with OSA often have a neck circumference of 43 cm (17 inches) or more,
- \* Taking medicines that have a sedative effect - such as sleeping pills, or tranquillisers,
- \* Having an unusual inner-neck structure - such as an unusually narrow airway or unusually large tonsils or tongue or having a lower jaw that is set back further than normal.

## Suspected risk factors

Experts have also identified a number of suspected risk factors that they believe may also contribute to OSA. These are described below.

- \* Drinking alcohol before bedtime.
- \* Smoking.
- \* Being menopausal - the changes in hormone levels that occur during the menopause may cause the throat muscles to relax.
- \* Having a family history of OSA - there may be some genes that you inherit from your parents that can make you more susceptible to OSA.
- \* Taking the anti-impotence medicine sildenafil (Viagra) - there is some evidence to suggest that sildenafil can cause the throat muscles to relax.

## Obtaining a Diagnosis

If the symptoms appear to indicate you may suffer from OSA, the first step is to ask a partner, friend, or relative to observe you when you are asleep. They may be able to spot episodes of breathlessness that could help to confirm a diagnosis of obstructive sleep apnoea.

### Physical examination and tests

If you think that OSA may be a problem you should then see your GP who will ask you about your symptoms, such as whether you regularly fall asleep during the day against your will.

Your GP will also carry out a physical examination and a number of tests, including a blood pressure test and blood test in order to rule out other conditions that could explain your tiredness, such as an under-active thyroid gland (hypothyroidism).

### Testing at a sleep centre

If OSA is suspected, you may be referred to a sleep centre for further tests. Sleep centres are specialist clinics or hospital departments that help treat people with sleep disorders.

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Tests may involve:

- placing you in a darkened room during the daytime and asking you to relax before studying how long it takes for you to fall asleep.
- asking you to try and stay awake as long as possible.

If you fall asleep quickly during the first test and you are unable to stay awake in the second test, it may indicate that you have OSA.

You will also be asked questions such as 'how likely it is you would doze off in certain situations, such as sitting in a cinema or being a passenger in someone else's car'. This will help them to further assess the extent of your daytime sleepiness.

## Studying you while you are asleep

You may be asked to spend a night in the sleep clinic to study you while you are asleep and be monitored using a video camera.

There are two pieces of equipment normally used to monitor your body during sleep:

- An oximeter. This uses a small sensor attached to a computer is placed on your finger which sends out pulses of light. The computer studies how these pulses are absorbed by your blood and this information allows the computer to measure how much oxygen is in your blood at any one time. You may be provided with an oximeter so that you can carry out the test at home.
- A polysomnography (PSG). A series of electrodes connected to a computer are placed on different parts of your body. The computer measures your breathing rate, which stages of sleep you experience, the amount of oxygen in your blood, plus your heart rate and blood pressure. A PSG requires experienced technicians to carry out the test so it can only be carried out in a hospital, or sleep centre.

Once completed, the clinic staff should have a good idea about whether you have OSA and, if you do, to what extent it is interrupting your sleep.

The severity of OSA is judged on how many episodes of apnoea and hypopnoea you experience over the course of an hour:

- \* Mild OSA - between 5-14 episodes an hour.
- \* Moderate OSA - between 15-30 episodes an hour.
- \* Severe OSA - more than 30 episodes an hour.



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## Treatment

Where possible sufferers of OSA must make lifestyle changes to optimise their health. Mild cases of OSA can often be successfully treated in this way, especially if you are overweight or obese, or a smoker. More serious cases may require the use of a type of breathing apparatus known as continuous positive airway pressure (CPAP) to assist with breathing during sleep, however optimising health remains an essential part of the treatment.

## Lifestyle changes

Make changes to your lifestyle to optimise your health. For example:

- \* losing weight, especially if you are obese,
- \* avoiding alcohol, especially during the evening,
- \* quitting smoking, if you are a smoker, and
- \* avoiding the use of sleeping tablets and tranquillisers.

Try sleeping on your side, rather than on your back, as this has been found to help to relieve symptoms of OSA.

## Continuous positive airway pressure (CPAP)

If your OSA is moderate to severe or does not respond to the lifestyle changes suggested above, the use of continuous positive airway pressure (CPAP) is recommended. The CPAP has a mask that is placed over your nose which delivers a continuous supply of compressed air. The compressed air prevents the airway in your throat from closing.

You will need to use CPAP at night when you sleep, which can take a bit of getting used to. Modifications can be made to the device that may make it more comfortable. Older CPAP equipment often cause nasal dryness, nose bleeds and sore throat, however the newer types of CPAP have a humidifier which reduces these problems.

## Inter-oral devices (IODs)

Inter-oral devices (IODs) are small devices that you place in your mouth that are designed to keep your throat open while you sleep. IODs are less effective than CPAP, but may be suitable for mild OSA or for people who cannot tolerate using CPAP.

Problems associated with IODs include:

- \* increased saliva in your mouth, and
- \* tooth and gum pain.

However, these problems should reduce over time.



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## Stimulants

If your symptoms of daytime sleepiness are particularly severe, you may be given a short-term dose of a stimulant that work by increasing the activity within your nervous system in order to make you feel more alert and awake during the day. The stimulant modafanil may be recommended, however side effects of modfanil can include:

- \* dizziness, and
- \* blurred vision.

As discussed in Complications you should not drive or operate heavy machinery if you are experiencing severe symptoms of daytime sleepiness, and the side effects listed above will further affect your ability and judgement. In rare situations, modafanil can cause depression and make people think suicidal thoughts. If this occurs, you should stop taking the medicine and see your GP.

The long-term use of stimulants is not recommended because they can become addictive.

## Surgery

The use of surgery to treat OSA is usually not recommended and usually only considered as a last resort when all other treatment options have failed, and where OSA is severely affecting your quality of life. Evidence also shows that surgery does not tend to be as effective as CPAP in controlling symptoms.

The preferred surgical treatment for OSA is a tracheostomy where a tube is inserted directly into your neck to allow you to breathe freely, even if the airways in your upper throat are blocked.

## Alternative treatment

As unusual as it sounds, there is evidence that regularly playing the Australian wind instrument, the didgeridoo, can strengthen the muscles in your upper airways and help to reduce the symptoms of mild to moderate OSA.

A study found that people who attended regular didgeridoo lessons and practiced everyday for four months experienced a significant reduction in daytime sleepiness.



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## Complications of sleep apnoea

### High blood pressure

Many people with OSA also have high blood pressure (hypertension). This also increases your risk of developing a cardiovascular disease (conditions affecting the heart and blood circulation) such as a stroke or heart attack.

It is currently uncertain whether hypertension is a direct response to OSA, or whether it is a result of an underlying cause of OSA, such as obesity. However, taking regular exercise and eating a healthy, balanced diet is the best way reduce your weight and to prevent hypertension.

### Driving

One study has calculated that people with severe untreated OSA are 15 times more likely to be involved in a car accident.

If you are experiencing significant daytime sleepiness, it will have an adverse impact on your driving ability. You should avoid driving until your symptoms of OSA respond to treatment and you are no longer experiencing the symptoms of daytime sleepiness.

Falling asleep at the wheel is a criminal offence and may lead to a prison sentence. If you are diagnosed with OSA you are required to inform the Driver and Vehicle Licensing Agency (DVLA). Failure to notify DVLA is a criminal offence and is punishable by a fine of up to £1,000.

After you have informed the DVLA that you have OSA you will not lose your driving licence as long as you are complying with your recommended treatment plan. You will be allowed to drive once your symptoms are under control.

If you have a group two licence, which is required for specialist vehicles such as heavy goods vehicles, the DVLA will require confirmation that your symptoms are under control from a specialist in treating OSA.



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