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## Sleep Apnoea Information:

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Sleep apnoea is a sleep disorder characterized by pauses in breathing during sleep. Each episode, called an apnoea, lasts long enough so that one or more breaths are missed, and such episodes occur repeatedly throughout sleep. The standard definition of any apnoeic event includes a minimum 10 second interval between breaths, with either a neurological arousal, a blood oxygen desaturation, or both arousal and desaturation. Sleep apnoea is diagnosed with an overnight sleep test called a polysomnogram, or a "sleep study".

Clinically significant levels of sleep apnoea are defined as five or more episodes per hour of any type of apnoea (from the polysomnogram). There are three distinct forms of sleep apnoea: central, obstructive, and complex (i.e., a combination of central and obstructive) constituting 0.4%, 84% and 15% of cases respectively. Breathing is interrupted by the lack of respiratory effort in central sleep apnoea; in obstructive sleep apnoea, breathing is interrupted by a physical block to airflow despite respiratory effort. In complex (or "mixed") sleep apnoea, there is a transition from central to obstructive features during the events themselves.

Regardless of type, the individual with sleep apnoea is rarely aware of having difficulty breathing, even upon awakening. Sleep apnoea is recognized as a problem by others witnessing the individual during episodes or is suspected because of its effects on the body. Symptoms may be present for years (or even decades) without identification, during which time the sufferer may become conditioned to the daytime sleepiness and fatigue associated with significant levels of sleep disturbance.

**Common symptoms:** include loud snoring, restless sleep, and sleepiness during the daytime.

Snoring in combination with other conditions such as overweight and obesity has been found to be highly predictive of OSA risk. The loudness of the snoring is not indicative of the severity of obstruction, however. If the upper airways are tremendously obstructed, there may not be enough air movement to make much sound. Even the loudest snoring does not mean that an individual has sleep apnoea syndrome. The sign that is most suggestive of sleep apnoeas occurs when snoring stops. If both snoring and breathing stop while the person's chest and body try to breathe, that is literally a description of an event in obstructive sleep apnoea syndrome. When breathing starts again, there is typically a deep gasp and then the resumption of snoring.

Other symptoms include - obesity BMI >30, large neck circumference (16 in (410 mm) in women, 17 in (430 mm) in men), enlarged tonsils and large tongue volume, micrognathia (small jaw) morning headaches, irritability/mood-swings/depression, learning and/or memory difficulties, and sexual dysfunction.

### Why do we need to treat it??

Sleep-disordered breathing is associated with an increased risk of cardiovascular disease, stroke, high blood pressure, arrhythmias, diabetes, and sleep deprived driving accidents. When high blood pressure is caused by OSA, the readings do not drop significantly when the individual is sleeping. Stroke is associated with obstructive sleep apnoea. Sleep apnoea sufferers also have a 30% higher risk of heart attack or premature death than those unaffected. Research has also revealed that people with OSA show tissue loss in brain regions that help store memory, thus linking OSA with memory loss.

### Treatment:

Lifestyle change, avoid alcohol or muscle relaxants, lose weight, and quit smoking. Many people benefit from sleeping at a 30-degree elevation of the upper body or higher, as if in a recliner. Doing so helps prevent the gravitational collapse of the airway. Lateral positions (sleeping on a side), as opposed to supine positions (sleeping on the back), are also recommended as a treatment for sleep apnoea.

In mild cases of obstructive sleep apnoea, use of a specially shaped pillow or shirt may reduce sleep apnoea episodes, usually by causing users to sleep on the side instead of on the back or in a reclining position instead of flat.

Jaw Advancement appliances – these act to keep the airway open in sleep. Simple ones can be purchased from the chemist and trialled and if improvement noted then I recommend a custom made device from your dentist.

The oral appliance is a custom-made mouthpiece that shifts the lower jaw forward, which opens up the airway. OAT is usually successful in patients with mild to moderate obstructive sleep apnoea. Precise control of the position of the mandible is crucial to the success of an oral appliance.

CPAP "[Breathing machines](#)" act to use air to widen the airway and form the mainstay of treatment

Surgical options:

Surgery is usually considered to allow the wearing of a CPAP mask with more comfort and to help reduce the severity of mild to moderate OSA.

Tonsillectomy and Palate surgery can be done to help with mild snoring but evidence suggests most people return to snoring within 5 years of the operation. Nasal septum surgery – is usually done to help with wearing the CPAP device and can improve patient comfort significantly. Other surgery options may attempt to shrink or stiffen excess tissue in the mouth or throat, procedures done at either a doctor's office or a hospital. Small shots or other treatments, sometimes in a series, are used for shrinkage, while the insertion of a small piece of stiff plastic is used in the case of surgery whose goal is to stiffen tissues.

More invasive major surgery such as jaw advancement and tongue reduction can be considered for those people with severe sleep apnoea and who can't tolerate CPAP. Tracheostomy can be performed as a last resort. These more invasive procedures are done in major metropolitan centres only. The Stanford Center for Excellence in Sleep Disorders Medicine achieved a 95% cure rate of sleep apnoea patients by surgery. **Maxillomandibular advancement** (MMA) is considered the most effective surgery for sleep apnoea patients, because it increases the posterior airway space (PAS). The main benefit of the operation is that the oxygen saturation in the arterial blood increases. In a study published in 2008, 93.3% of surgery patients achieved an adequate quality of life based on the Functional Outcomes of Sleep Questionnaire (FOSQ). Surgery led to a significant increase in general productivity, social outcome, activity level, vigilance, intimacy and sex, and the total score postoperatively was  $P = .0002$ . Overall risks of MMA surgery are low: The Stanford University Sleep Disorders Center found 4 failures[[which?](#)] in a series of 177 patients, or about one out of 44 patients.

### **Treatment**

In addition to CPAP, a dentist specializing in sleep disorders can prescribe Oral Appliance Therapy (OAT).

OAT is a relatively new treatment option for sleep apnoea in the United States, but it is much more common in Canada and Europe. In Singapore, there is a new treatment.

### **Alternative treatments**

A 2005 study in the British Medical Journal found that learning and practicing the **didgeridoo** helped reduce snoring and sleep apnoea as well as daytime sleepiness. This appears to work by strengthening muscles in the upper airway, thus reducing their tendency to collapse during sleep. A program that uses specialized "singing" exercises to tone the throat, in particular the soft palate, tongue and nasopharynx, is 'Singing for Snorers' by Alise Ojay. Dr. Elizabeth Scott, a medical doctor living in Scotland, had experimented with singing exercises and found considerable success, as reviewed in her book *The Natural Way to Stop Snoring* (London: Orion 1995) but had been unable to carry out a clinical trial. Alise Ojay, a choir director singer and composer, began researching the possibility of using singing exercises to help a friend with snoring and came across Dr. Scott's work. In 1999, as an Honorary Research Fellow with the support of the Department of Complementary Medicine at the University of Exeter, Alise conducted the first trial of singing exercises to reduce snoring. The results were described by Ojay as promising and after two years of investigations, she designed the 'Singing for Snorers' program in 2002. The independent nonprofit UK consumer advocacy group **Which?** reviewed Singing for Snorers. Their physician Dr. Williams "feels the company is ethical in 'offering aims not claims' until research is complete" and the review stated: "Combining the programme with diet and exercise, the snorer in our test couple found real improvements in the volume and frequency of his snoring after six weeks. His partner is sleeping better, too." In the case of snorers who also have sleep apnoea, there is anecdotal evidence from some of the users of Ojay's program, as she reports on her page, as reported by an American, Charley Hupp, who flew to the UK to personally thank her, on his web page and as reported by one user in the UK on the discussion forum of the British Snoring and Sleep Apnoea Association. This person reported that sleep tests before and after the program showed a significant effect: "My apnoeas had gone down from 35 to 0.8 per hour."

### **Surgery and anaesthesia in patients with sleep apnoea**

Several inpatient and outpatient procedures use sedation. Many drugs and agents used during surgery to relieve pain and to depress consciousness remain in the body at low amounts for hours or even days afterwards. In an individual with either central, obstructive or mixed sleep apnoea, these low doses may be enough to cause life-threatening irregularities in breathing or collapses in a patient's airways. Use of analgesics and sedatives in these patients postoperatively should therefore be minimized or avoided. Surgery on the mouth and throat, as well as dental surgery and procedures, can result in postoperative swelling of the lining of the mouth and other areas that affect the airway. Even when the surgical procedure is designed to improve the airway, such as tonsillectomy and adenoidectomy or tongue reduction, swelling may negate some of the effects in the immediate postoperative period. Once the swelling resolves and the palate becomes tightened by postoperative scarring, however, the full benefit of the surgery may be noticed. Individuals with sleep apnoea generally require more intensive monitoring after surgery for these reasons.

Sleep apnoea patients undergoing any medical treatment must make sure his or her doctor and/or anaesthetist are informed about their condition. Alternate and emergency procedures may be necessary to maintain the airway of sleep apnoea patients. If an individual suspects he or she may have sleep apnoea, communication with their doctor about possible preprocedure screening may be in order.