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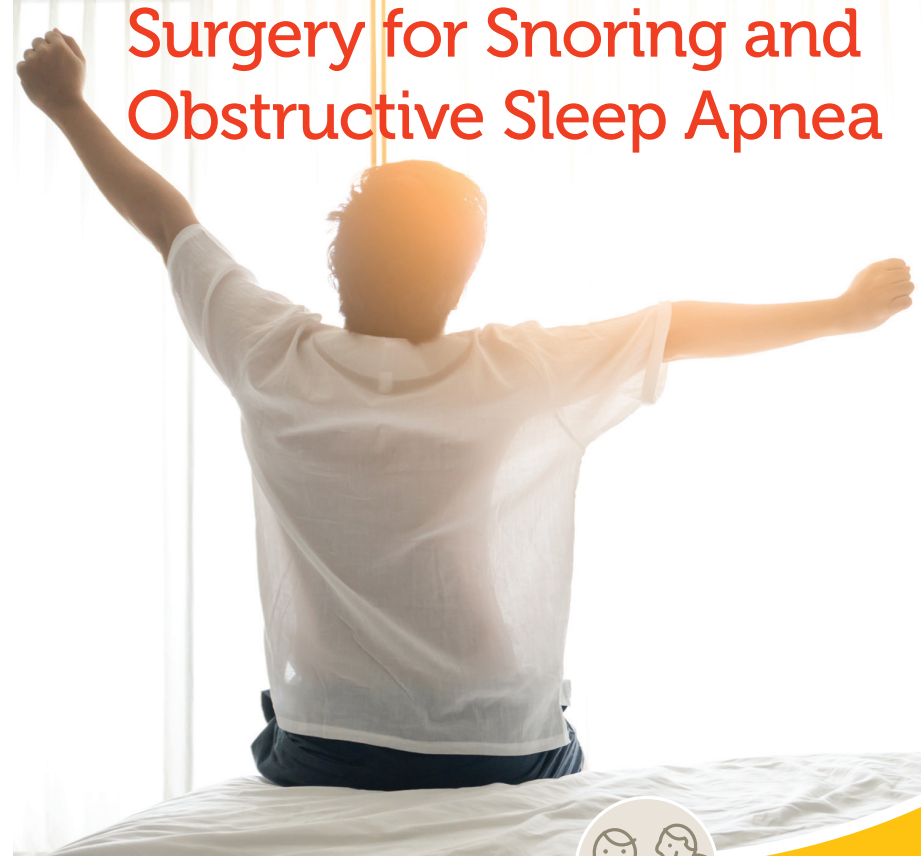


Clinical Measurement Centre
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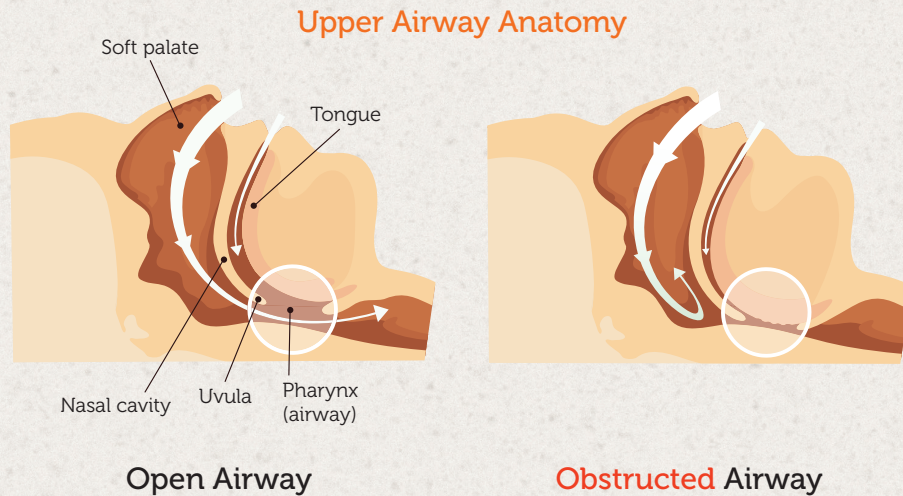
SLEEP MEDICINE

Surgery for Snoring and Obstructive Sleep Apnea



Obstructive Sleep Apnea (OSA)

OSA is a common condition affecting roughly 1 in 3 people. It is caused by the narrowing and collapsing of the upper airway during sleep. Surgery is one of the treatment options for obstructive sleep apnea.



How can surgery help?

Surgery widens the upper airway space by:

- reducing excess tissue
- reducing collapsibility of tissue

What are the aims of surgery?

Surgery can be done to:

- Facilitate usage of Continuous Positive Airway Pressure (CPAP) machine
- Improve snoring and sleep apnea symptoms

What are the surgery options available for the treatment of OSA?

Common surgeries for OSA include (but are not limited to):

- Tonsillectomy
- Uvulopalatopharyngoplasty
- Septoplasty
- Inferior turbinoplasty
- Radiofrequency inferior turbinate
- Nasal valve stabilisation
- Adenoidectomy
- Radiofrequency palate/tongue
- Coblation tongue channeling
- Robotic surgery
- Bony surgery
- Tracheostomy

Which surgery is right for me?

To assess which surgery is suitable and necessary for you, you will have to first undergo a **Drug-Induced Sleep Endoscopy** in the hospital. This is a simple procedure, usually done as a day surgery, where you will be given some medications to reach an induced sleep state. At this state, your muscles will be relaxed and an upper airway endoscopy will be performed, which allows us to better evaluate the areas of narrowing in your upper airway. Based on this assessment, your doctor will discuss with you which surgery is suitable for you.

What should I expect if I choose to undergo surgery?

If you decide to undergo surgery, your surgeon will discuss with you as to which surgery is suitable for you. A combination of surgeries may be recommended for your snoring and sleep apnea as this condition is often caused by an obstruction at a few different levels in the upper airway.

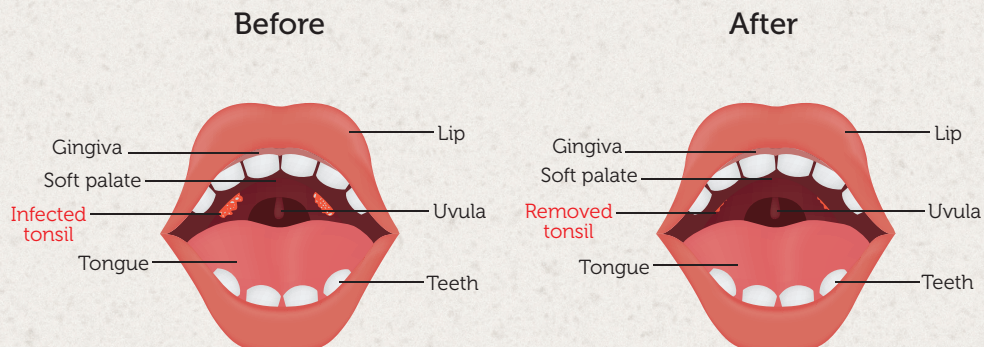
Surgery aims to improve symptoms and alleviate your condition. However, there can be some residual snoring, persistent symptoms or relapse of symptoms after surgery. This is because there are various other contributing factors including excess weight and muscle laxity that come with aging, as well as family history predisposition.

Some patients may also need other complementary treatment after surgery. This may include weight loss, dental appliance, myofunctional therapy, use of continuous positive airway pressure (CPAP) therapy, treatment of nasal allergies, maintenance of sleep hygiene and having an active lifestyle, etc.

Different types of snoring and sleep apnea surgery

Tonsillectomy

This surgery removes both tonsils. Large tonsils can cause the narrowing of the upper airway which makes it difficult for patients to breathe. The operation is done under general anaesthesia. There are no external cuts or scar. Tonsillectomy is also commonly done in combination with uvulopalatopharyngoplasty to expand the oropharyngeal (oral) part of the upper airway.

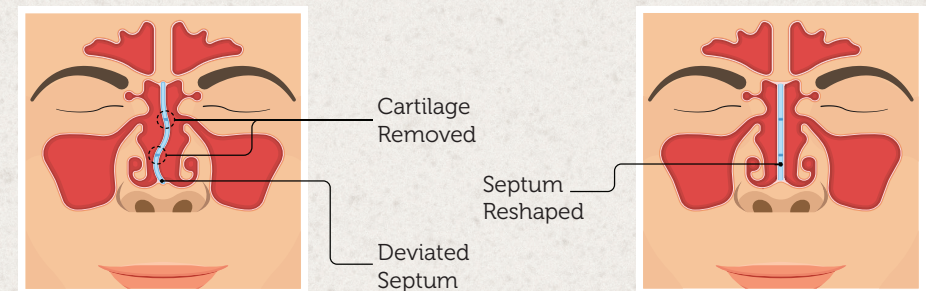


Uvulopalatopharyngoplasty

This is one of the most common surgeries for snoring and sleep apnea. A patient who snores or has sleep apnea often has thickened and lax uvula, palate, and pharyngeal muscles that cause the narrowing of the upper airway. This surgery helps by cutting away excess tissues and uses stitches to increase the tension of the tissues to widen your airway. The operation is done under general anaesthesia. There are no external cuts or scar.

Septoplasty

This operation is usually offered to patients with a blocked nasal airflow due to a deviated or bent septum (the centre division of the nose). Surgery aims to straighten the bent septum to provide better nasal airflow. The operation is done under general anaesthesia. There are no external cuts or scar.



Inferior turbinoplasty

This operation is usually offered to patients with a blocked nasal airflow due to an enlarged inferior turbinate. Inferior turbinates are bones in our nose that are covered with mucosa lining (soft tissues). When enlarged, they can reduce the air passage within our nose. Surgery aims to reduce the size of the turbinate by cutting away some bone and soft tissue linings to provide better nasal airflow. The operation is done under general anaesthesia. There are no external cuts or scar.

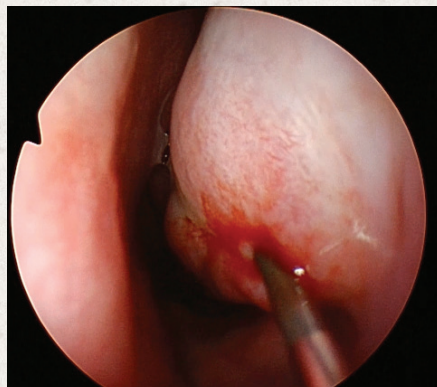
Radiofrequency inferior turbinate

This operation is also usually offered to patients with a blocked nasal airflow due to an enlarged inferior turbinate. Inferior turbinates are normal bones in our nose that are covered with soft tissue linings. When enlarged, they can reduce air passage within our nose.

The surgery involves using radiofrequency energy to generate thermal energy. This reduces the volume of the tissue swelling of the inferior turbinate, thus providing better nasal airflow. The operation can be done under local or general anaesthesia. There are no external cuts or scar.



Swollen left inferior turbinate before surgery, causing blockage of nasal passage



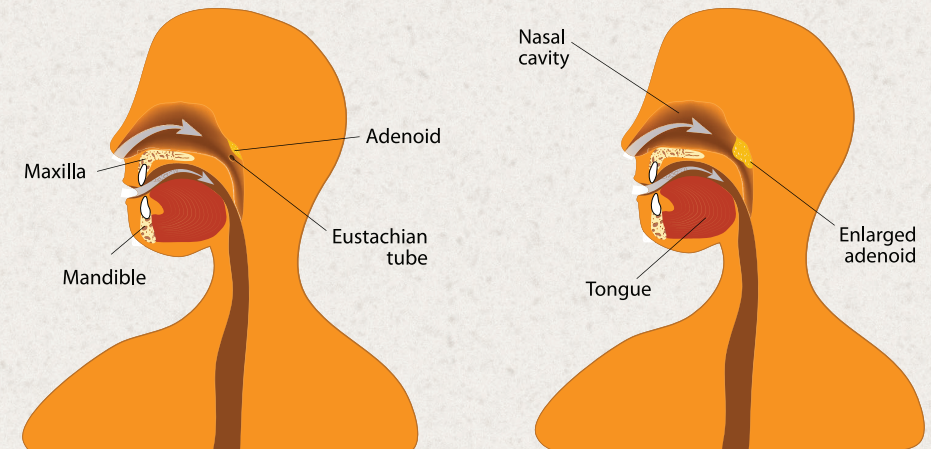
Shrunken left inferior turbinate at the end of surgery after radiofrequency application

Nasal valve stabilisation

This operation is helpful for patients with nasal valve collapse. It involves stitching to anchor the weak nasal cartilage to the bony side wall of the nose. This prevents the collapse of the nasal valve when you breathe with your nose. This operation can be done in combination with septoplasty and inferior turbinoplasty to provide better nasal airflow. The operation is done under general anaesthesia. There are no external cuts or scar.

Adenoidectomy

This surgery removes adenoids, which are lymphoid tissues at the back of your nose. Some patients may have enlarged adenoids that can cause nasal blockage and narrowing of the upper airway. The operation is done under general anaesthesia. There are no external cuts or scar.



Radiofrequency soft palate/tongue

Radiofrequency of soft palate/tongue utilises thermal ablation to achieve volumetric reduction and stiffening of the soft palate/tongue. This can help reduce the vibration and collapse of the soft palate/tongue. The operation can be done under local or general anaesthesia. There are no external cuts or scar.



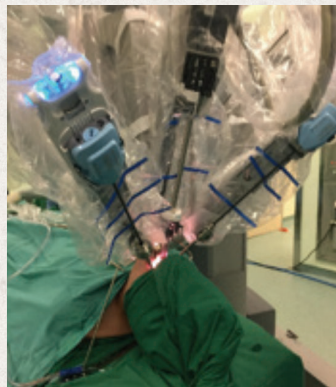
Coblation tongue channelling

This surgery uses coblation technology which is bipolar radiofrequency energy to reduce the volume of the tongue. It also stiffens the tongue to prevent it from flopping backwards and obstructing the upper airway. This is usually offered to patients with tongue enlargement or laxity causing the narrowing of the upper airway. The operation is done under general anaesthesia. There are no external cuts or scar.



Robotic surgery

Advanced robotic technology is used to help remove excess tongue base or epiglottis tissue, which can cause a blockage of the airway passage during sleep. Robotic technology allows good visualisation of the surgery area and removal of the targeted excess tissues. The operation is done under general anaesthesia. There are no external cuts or scar.



Bony surgery

Bony surgery including sliding genioplasty and maxillomandibular advancement are beneficial surgeries to widen your upper airway. It is usually offered to patients with retrusive maxilla (upper jaw) and/or mandible (lower jaw) which causes upper airway narrowing. The operation is done under general anaesthesia. There are no external cuts or scar.

Tracheostomy

Tracheostomy is a surgery that involves the creation of an opening at the windpipe. It bypasses the obstructions at the upper airway and provides direct air entry into the lungs via the windpipe. This surgery is usually done under general anaesthesia and there will be an external neck cut. This surgery is rarely done in the current day for obstructive sleep apnea.

How long is the hospital stay?

In general, most patients will stay in the hospital for 1 - 5 days after surgery. This depends on the type and combination of surgery you undergo. Some patients may require post-operative monitoring in the High Dependency Unit (HDU) or Intensive Care Unit (ICU). Our doctor will advise you with more details when the type and combination of surgery are determined.

What should I expect or watch out for after the operation?

In general, 2 weeks of hospitalisation leave will be given following the surgery. Some blood in the mucus or saliva are to be expected in the first 1 - 3 weeks following the surgery. It is important to return to the hospital immediately if you experience fresh bleeding, difficulty in breathing, or any other discomforts.

When you swallow, you may experience a sensation of a lump at the back of your throat. This will usually improve and settle in due course. Your doctors will prescribe you painkillers and anti-inflammatory medications. You may find it more comfortable to stay on liquid or soft diet (such as soup and porridge) for the first 1 - 2 weeks. Your surgeon will discuss the details of your operation, operative risks and potential complications with you.

What else can I do to improve my surgical outcome?

- Weight control by having a healthy diet and active lifestyle
- Myofunctional therapy
- Dental appliance
- Continuous Positive Airway Pressure (CPAP) therapy
- Ensure any nasal allergy is treated
- Ensure adequate sleep hygiene

Any alternative treatments other than surgery?

You can seek advice from your sleep physician or surgeon. There are other alternatives available, including CPAP therapy, dental appliance, weight loss, myofunctional therapy, etc.

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