

# Sleep Centre



## Surgery for Snoring and Obstructive Sleep Apnoea

### Clinical Sites:



Singapore  
General Hospital  
SingHealth



Changi  
General Hospital  
SingHealth



Sengkang  
General Hospital  
SingHealth

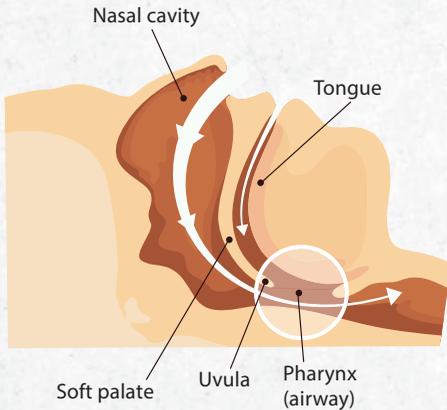


KK Women's and  
Children's Hospital  
SingHealth

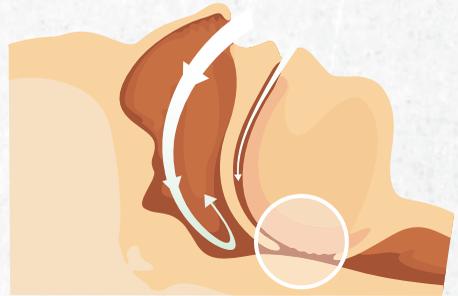
# Obstructive Sleep Apnoea (OSA)

Obstructive sleep apnoea (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 OSA.

## Upper Airway Anatomy



**Open Airway**



**Obstructed Airway**

## 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 the continuous positive airway pressure (CPAP) machine
- Improve snoring and sleep apnoea symptoms

# Surgery Options 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 of the palate/tongue
- Coblation tongue channelling
- Robotic surgery
- Bony surgery
- Tracheostomy

## What Should I Expect If I 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 apnoea as this condition is often caused by obstructions 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 ageing, as well as family history predisposition.

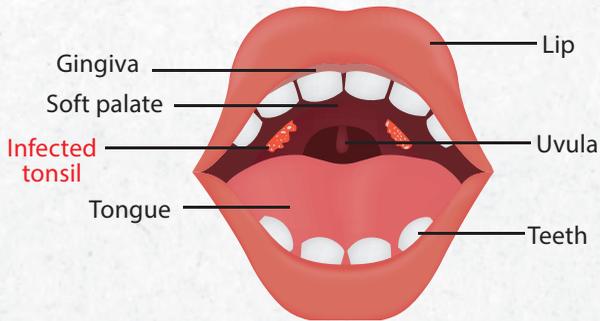
Some patients may also need other complementary treatment after surgery. This may include weight loss, dental appliance, myofunctional therapy, use of continuous positive airway pressure (CPAP) therapy, treatment of nasal allergies, maintenance of sleep hygiene and having an active lifestyle, etc.

# Different Types of Surgery for Snoring and Sleep Apnoea

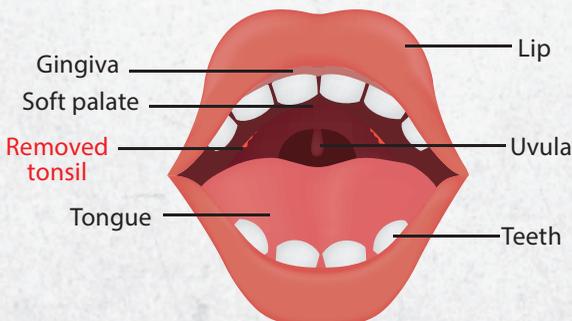
## Tonsillectomy

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 scars. Tonsillectomy is also commonly done in combination with uvulopalatopharyngoplasty to expand the oropharyngeal (oral) part of the upper airway.

### Before



### After

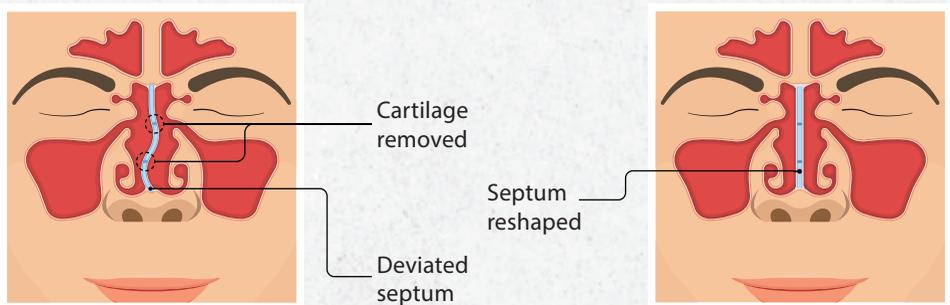


## Uvulopalatopharyngoplasty

This is one of the most common surgeries for snoring and sleep apnoea. A patient who snores or has sleep apnoea 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 tissue, and uses stitches to increase the tension of the tissue to widen your airway. The operation is done under general anaesthesia. There are no external cuts or scars.

## 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 scars.



## 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 noses that are covered with mucosa lining (soft tissue). When enlarged, they can reduce the air passage within our noses. 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 scars.

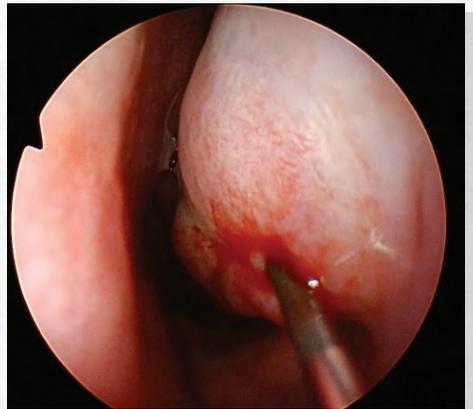
## Radiofrequency inferior turbinate

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 noses that are covered with soft tissue linings. When enlarged, they can reduce air passage within our noses.

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 scars.



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



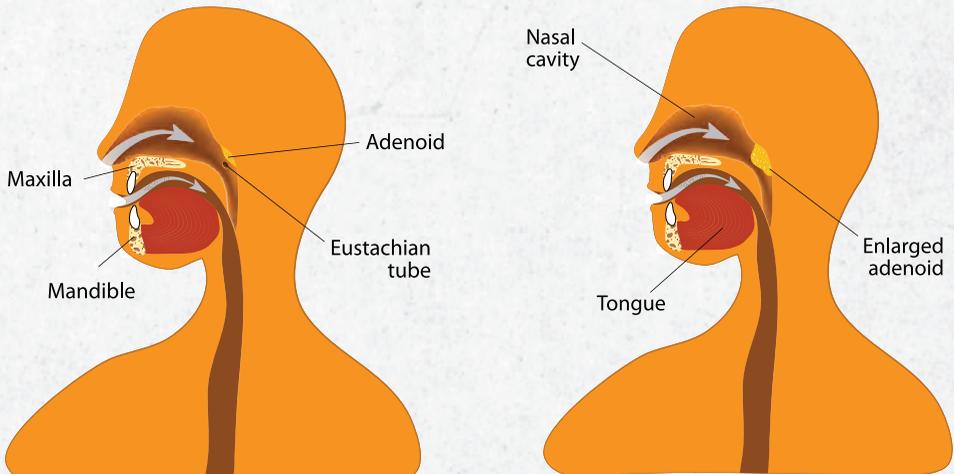
*Shrunken left inferior turbinate at the end of surgery after radiofrequency application*

## 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 scars.

## 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 scars.



## Radiofrequency of the soft palate/tongue

Radiofrequency of the 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 scars.



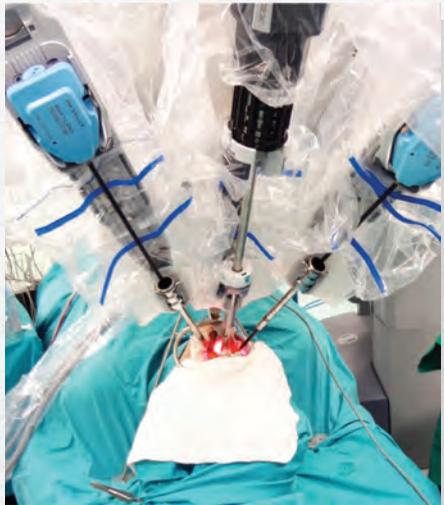
## Coblation tongue channelling

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 scars.



## 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 tissue. The operation is done under general anaesthesia. There are no external cuts or scars.



## **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 scars.

## **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 currently for OSA.

## **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). Your doctor will share more details with you when the type and combination of surgeries are determined.

## **What Should I Expect or Watch Out for After Surgery?**

In general, 2 weeks of hospitalisation leave will be given following the surgery. Some blood in the mucus or saliva is 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 discomfort.

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 diets (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
- Treating any nasal allergies
- Practising adequate sleep hygiene

## **Are There Alternative Treatments to 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.



# Sleep Centre

## Clinical Sites:



**Singapore General Hospital**  
SingHealth

### Sleep Centre

Outram Community Hospital  
SingHealth Tower, Level 3

-  10 Hospital Boulevard, Singapore 168582
-  6321 4377
-  [www.sgh.com.sg](http://www.sgh.com.sg)



**Sengkang General Hospital**  
SingHealth

### Sleep Medicine Service - Sleep Diagnostics

Medical Centre, Level 6

-  110 Sengkang East Way, Singapore 544886
-  6930 6000
-  [www.skh.com.sg](http://www.skh.com.sg)



**Changi General Hospital**  
SingHealth

### Changi Sleep & Assisted Ventilation Centre

Medical Centre, Level 2

### Sleep Laboratory

Integrated Building, Level 8, Ward 58

-  2 Simei Street 3, Singapore 529889
-  6850 3333
-  [www.cgh.com.sg](http://www.cgh.com.sg)



**KK Women's and Children's Hospital**  
SingHealth

### Sleep Clinic

Children's Tower, Level 1, Specialist Outpatient Clinic K

-  Bukit Timah Road, 100, Singapore 229899
-  6294 4050
-  [www.kkh.com.sg](http://www.kkh.com.sg)



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