Things to discuss...

when considering surgery for snoring & sleep apnoea

Authors & reviewers:

Prof. Bhik Kotecha M.Phil., FRCS, DLO
Prof. Ian Ormiston
FDSRCS, FRCS, FHKAM
Adrian Zacher MBA
Things to discuss... when considering surgery for snoring & sleep apnoea

(Intentionally left blank as this is the inside front cover when printing double sided)
Things to discuss... when considering surgery for snoring & sleep apnoea

Contents

Introduction ......................................................................................................................... 4

Surgery for snoring and sleep apnoea ................................................................. 7
  History, examination, tests, diagnosis ................................................................. 7
  Likelihood to gain weight ..................................................................................... 9

Surgery confined to soft tissue ................................................................. 10
  Radiofrequency surgery ..................................................................................... 13
  Laser assisted uvulopalatoplasty (LAUP) ............................................................ 14
  Soft palate implants ............................................................................................ 15
  UvuloPalatoPharyngoPlasty (UPPP) ................................................................. 16
  Trans-oral robotic surgery (TORS) .................................................................... 17

Oral & Maxillofacial surgery ............................................................................ 18
  Osteotomy ........................................................................................................... 19
  Hyoid suspension ............................................................................................... 21
  Tracheostomy ..................................................................................................... 22
  Bariatric surgery ............................................................................................... 23
  Neural stimulation ............................................................................................. 24

Summary .................................................................................................................. 26

What next? ............................................................................................................. 27

Appendix ................................................................................................................. 28
  Acronym glossary ............................................................................................... 28
  References ........................................................................................................... 29
  Further reading ................................................................................................... 32
  Support groups .................................................................................................... 32
  Legal statements ................................................................................................ 32
  Snorer.com gives you control ........................................................................... 33
  Authors & reviewers ......................................................................................... 33
  Important (but a bit boring) information........................................................... 36
Things to discuss... when considering surgery for snoring & sleep apnoea

(Intentionally left blank for double sided printing)
Introduction

This guide starts from the point where lifestyle\(^1\) and self-help options have been tried and haven’t proven successful. If you are reading this without having a broad understanding of snoring and obstructive sleep apnoea (OSA) treatments then we suggest you first look at the Snorer.com Snoring and Sleep Apnoea Overview Guide [here](https://snorer.com/information-guides/).

Snoring and obstructive sleep apnoea may be thought of as essentially the same problem but at different levels of severity. Snoring may be defined as “breathing during sleep with hoarse or harsh sounds”, while obstructive sleep apnoea (OSA) is not just noisy, it is when the airway during sleep collapses, causing obstruction, and the obstruction causes the apnoea (cessation of breathing).

Although surgeries are rarely performed, surgical approaches have been largely confined to reduction of the soft palate and uvula (dangly bit in the mouth) and/or removal of nasal polyps ('lumps' inside your nasal airway) or septum straightening (correcting a crooked nose) and more recently advancing the upper and lower jaws which advances the soft palate and tongue, opening up the airway, known as an MMA.

If you are considering surgery, your hospital doctor or specialist will discuss with the options with you. This will include the likelihood of success, goals of the treatment, risks and benefits of the procedure, possible side-effects, complications and alternative treatments.\(^2\)

This guide does not pretend to explain everything in detail; it is intended to provide an accessible, evidence-based introduction, sufficient to help you engage in conversation with your medical professional.
Things to discuss… when considering surgery for snoring & sleep apnoea

While this is of course general information, in the diagram below (Figure 1) you will see how the various therapies, lifestyle changes and surgery all interrelate. Where you are on the disease severity axis, along with any other conditions you may have, could indicate various options.

The myriad of variables is one reason why you must have an overnight sleep apnoea assessment (known as a ‘Sleep Study’) and a thorough ENT examination before considering any form of surgery.\(^3\) If there is a restriction in your throat, that if removed would help you use another treatment more effectively, then exceptionally, surgery may help.

If you have a ‘set back’ or what is known as a retruded lower jaw (where your teeth are well behind those of the upper jaw) surgery to advance your lower jaw (which will also bring the tongue forwards and open the
Things to discuss... when considering surgery for snoring & sleep apnoea

Airway) may be indicated. Even those with normal ‘bite’ positions may benefit from the advancement of the upper and lower jaw.

The extract below is taken from the 2005 “Surgery for Obstructive Sleep Apnoea in Adults”, Cochrane Database of Systematic Reviews. 4

The Cochrane database has an excellent reputation, as they collate medical papers and review lots of patients with similar problems.

“Surgery for obstructive sleep apnoea/hypopnoea syndrome aims to relieve obstruction by increasing the size of the airway in the throat, bypassing the airway or removing a lesion. A limited number of trials assessing diverse surgical techniques were identified. There were inconsistent effects reported across the trials. The available evidence from these small studies does not currently support the widespread use of surgery in people with mild to moderate daytime sleepiness associated with sleep apnoea.”

This means that, as a general rule, surgery is appropriate for snoring but not for sleep apnoea. However, in a select group of patients surgical intervention may be appropriate even in the mild or moderately severe sleep apnoeic person. In other words, Cochrane is unable to prove surgical results. However, since 2006, it has been appreciated that in cases of severe OSA, MMA is appropriate for those that cannot use CPAP.

For example, if the individual had nasal polyps or really enlarged tonsils, then surgical intervention may result in a dramatic improvement in their symptoms. There are a number of patients who cannot tolerate PAP or mouthpieces and are not willing to accept PAP as a lifetime therapy.
Things to discuss... when considering surgery for snoring & sleep apnoea

This selective group, while admittedly small in numbers, may benefit from complex surgery.

Surgery for snoring and sleep apnoea

This Snorer.com Guide follows the logical flow of air into your body, through your nose, down your throat and past your larynx. Then it moves to surgery on the actual structure of your face – the bones.

In the same way that snoring and OSA are points along a line, the surgical approach changes and becomes progressively more serious from ENT to Oro-maxillofacial surgery, in correlation with the severity of the sleep problem.

History, examination, tests, diagnosis

You will no doubt have heard of the terms ‘diagnosis' and ‘treatment'. To determine what is happening (diagnosis) and how to help you best (treatment), the surgeon will review your medical history and ask you to undergo various thorough examinations and assessments.

As there are many causes of snoring - no one solution is appropriate. Only after an accurate diagnosis can the right treatment for you be determined.

Before you decide on surgery, talk it over with your GP or specialist Consultant and your partner. Surgical options for OSA are not usually recommended, as sleep apnoea responds better to positive airway pressure therapy (PAP) and can usually be managed through non-surgical means.

In a highly select group of patients however, surgery may be appropriate if treatment with PAP or mouthpieces [oral appliances] has failed.1
Things to discuss... when considering surgery for snoring & sleep apnoea

Radical surgery, as opposed to minimally invasive surgery, is irreversible. Once you have had surgery to remove something - it is gone. Minimally invasive surgery usually avoids removal of tissue and relies instead on scarring or stiffening floppy tissue.

1. **ASSESSMENT** – Together with a review or your history, this is to ask "what is wrong" and includes a review of your signs and symptoms (i.e. what you complain of and what the surgeon detects) together with examination and results of any tests.

2. **DIAGNOSIS** - The assessment may then facilitate a diagnosis, the underlying cause of your problem.

3. **TREATMENT** - Finally, provide the best answer to solve your problem, the 'treatment'. This quite often involves more than one anatomical level - a so-called multi-level problem. Generally it is appropriate to undertake the simplest and safest procedure to address the diagnosed problem to correct any anatomical obstruction.
Likelihood to gain weight

Your weight is an important confounding factor for sleep apnoea. If you lose weight it can have a positive impact and potentially lessen the severity of your sleep apnoea. Conversely, if you gain weight it can make your sleep apnoea worse. So, surgery for your current condition has to be considered in the context of your likelihood to change weight. This is something to think carefully about, discuss with your partner and your surgeon.

If you are overweight and can lose weight, a simple analogy would be that post weight-loss you will be breathing through a larger diameter snorkel.

There is more about weight and sleep apnoea in the Bariatric Surgery section on page 23.
Surgery confined to soft tissue

There is currently some difficulty in identifying who would benefit from surgery. It is not yet clear who will find that surgery resolves their problem and who will find that after a period the symptoms return.

Surgery may be required to address the nose, soft palate, tonsils and tongue. In many cases more than one anatomical region may need correction – this is known as multi-level surgery.

Polyps, tonsils, turbinates and deviated septums are abnormalities that compromise the nasal passage and result in patients complaining of nasal congestion. In addition, patients may also have other physiological complaints such as those of allergic rhinitis – the common allergens being pollen, dust mites or animals. Nasal congestion would certainly interfere with PAP therapy compliance and may need medical and surgical attention.

Any form of surgery would only occur after a thorough ENT assessment.
Figure 3 illustrates a nasal polyp (white area in the middle of the image). It is blocking most of the air passage in the nasal cavity. As such, it makes it difficult to breathe through this nostril making the air in the other nostril travel faster vibrating the tissue (making a snoring noise) or perhaps even collapsing the nostril altogether!

**Figure 3: View of the nasal cavity showing a polyp**

This diagram represents a view up your nose. The pink area is your skin; the white area is the ‘polyp’ that is causing the problem and the dark area is where air travels as you breathe.

The polyp is blocking most of the nasal airway on this side of the nasal cavity.

Surgery is occasionally considered as a first treatment when patients with snoring and/or mild sleep apnoea have severe obstructing anatomy that is surgically correctable. For example, having enlarged tonsils which restrict breathing. Surgery may also be considered to improve your ability to use other treatments such as PAP and oral appliances (mouthpieces).

Surgeons’ assessments for snoring then focuses upon the soft palate.

Is it creating the snoring noise by ‘flapping’ in the airflow as you breathe? This is where careful assessment can help the surgeon identify the problem. These tests may include passing a camera up your nose while you perform jaw and breathing manoeuvres.

There are several approaches to stopping this ‘flapping’ tissue at the back of your throat – read on!
Palatal surgery may be performed by a minimally invasive approach whereby the soft palate does not change its shape – instead it is tightened using injection snoreplasty®, palatal pillar implants or by performing radiofrequency surgery. Alternatively, more radical palatal surgery involves shortening and stiffening the soft palate by performing laser assisted uvulopalatoplasty (LAUP) or uvulopalatopharyngoplasty (UPPP).

- Surgical removal or reduction
  - Uvulopalatopharyngoplasty (UPPP)
    - Involves removal of the uvula (dangly bit at the back of the throat) and portions of the soft palate
  - Radiofrequency ablation
- Laser Assisted Uvulopalatoplasty (LAUP)
- Stiffening. Achieved through a process known as radiofrequency ablation or by implanting a rod into the soft palate.
Things to discuss... when considering surgery for snoring & sleep apnoea

Radiofrequency surgery

A number of procedures are available, and includes Somnoplasty®, Coblation® or Celon® radiofrequency. These are different energy emitting devices that can be used on the soft palate and/or the tongue to reduce the size and amount of soft tissue.

In some cases, these procedures can be carried out under local anaesthesia but more often, if multi-level treatment is required, then general anaesthesia may be more appropriate.

Radiofrequency ablation might be worth considering as an option if you have mild/moderate sleep apnoea, and have tried PAP and a mouthpiece [oral device] without success.11

In general, radiofrequency ablation does not have serious side-effects and pain is reported to occur for less duration (2.5 days on average) than other procedures.12 It is a sequential procedure that may take 3 or 4 outpatient visits to complete and NICE have suggested that short-term effectiveness and long term outcomes of this procedure are uncertain.13
Things to discuss... when considering surgery for snoring & sleep apnoea

Laser assisted uvulopalatoplasty (LAUP)

We have mentioned a form of surgery called laser assisted uvulopalatoplasty (LAUP). This procedure also assumes that the snoring noise is created by the soft palate.

Many patients do not have an exclusively soft palate problem, adding emphasis to the importance of thorough history, tests and examinations.

A laser is used to scar and sometimes remove the tissue and stiffen it, making it less likely to vibrate and make the snoring sound.

LAUP is a sequential procedure that may take 3 or 4 outpatient visits to complete.

Obstructive sleep apnoea is a serious medical condition. As such, it is a problem for the patient themselves and not so much a partner perceived anti-social snoring problem.

LAUP is not usually recommended in isolation for the treatment of obstructive sleep apnoea however, in selected cases, it may be appropriate to perform LAUP in conjunction with other surgical procedures addressing upper airway obstruction.
Things to discuss... when considering surgery for snoring & sleep apnoea

Soft palate implants

This is a relatively new technique to stiffen the soft palate instead of remove it. The idea is that rods known as a 'pillar implants' are inserted into the soft palate under a local anaesthetic, to reduce the tendency to vibrate (and make noise).

![Figure 6: Soft palate implants](image)

Typically three small nylon rods are inserted completely under the skin to stiffen the soft palate to reduce the tendency to vibrate.

In the USA, the FDA has approved certain soft palate implants in selected patients for snoring and mild to moderate sleep apnoea.

However, in the United Kingdom, NICE guidelines state that:

> “Current evidence on soft-palate implants for obstructive sleep apnoea (OSA) raises no major safety concerns, but there is inadequate evidence that the procedure is efficacious in the treatment of this potentially serious condition for which other treatments exist. Therefore, soft-palate implants should not be used in the treatment of this condition.”

ACRONYM ALERT!

FDA = Food & Drug Administration (USA)

NICE = National Institute for Health and Care Excellence (previously known as National Institute for Clinical Excellence)

Further information can be found in the References section of the Appendix at the end of this Snorer.com Guide.
Things to discuss... when considering surgery for snoring & sleep apnoea

Although not currently offered by the NHS in the UK, pillar implants are available privately. Factors such as appropriate patient selection and correct placement of the implants are very important for success. In a recent study ~9% of the implants 'extruded' which means they came out from under the skin and had to be removed.  

UvuloPalatoPharyngoPlasty (UPPP)

An invasive surgical procedure called a uvulopalatopharyngoplasty (UPPP) may, in certain circumstances, be performed. It is less commonly performed than in the past. Patient selection is very important to determine who will obtain a positive response from the surgery. 

Figure 7: UvuloPalatoPharyngoPlasty (UPPP)

While you are under a general anaesthetic, the surgeon trims the tissue at the back of your throat. Reducing the tissue in this area may open up your airway and make it wider. This sometimes can allow air to move through the throat more easily when you breathe, reducing the severity of obstructive sleep apnoea (OSA).
Things to discuss... when considering surgery for snoring & sleep apnoea

If your snoring is caused by large tonsils and/or adenoids, these can be removed in an operation called a tonsillectomy or adenoidectomy. Your surgeon would discuss this with you as this operation may be performed at the same time as the UPPP.

There are serious risks associated with UPPP surgery, including what is known as nasal incompetence and severe post-surgery bleeding.

Trans-oral robotic surgery (TORS)

Trans-oral robotic surgery (TORS) is a new, ‘salvage’ surgical procedure for selected patients with moderate to severe OSA, who have not tolerated or not successfully used other treatments.

When assessment and diagnosis have implicated the base of the tongue as being the cause of the problem, TORS improves access to the tongue base area (compared to conventional ‘line of sight’ approaches) because it enables the surgeon to operate ‘around corners’.

This improvement may correlate with improved surgical outcomes, however, long-term comparative evaluation in larger patient samples is necessary.
Things to discuss... when considering surgery for snoring & sleep apnoea

Oral & Maxillofacial surgery

Oral & maxillofacial surgery is “surgery on the bones of the mouth, jaws, teeth and face.” It is indicated for treatment of severe sleep apnoea in patients who cannot tolerate or have found PAP and mouthpieces ineffective. Also, should your jaws not align, surgery can change this, it may be particularly relevant if your lower jaw is set well behind the upper (undershot). Oral & maxillofacial surgery is a useful single procedure able to correct airway obstruction at all levels with increasing evidence of success.

If you lie on your back with an obstructed airway, the first aid principle is to hold the lower jaw (and tongue) forward – the so-called ‘tongue thrust.’ Mandibular advancement surgery mimics this movement 24 hours a day, 7 days a week.

It is very important to weigh up the likelihood of success, goals of the surgery, possible side-effects, and complications and consider alternative options.

Oral & maxillofacial surgery, in particular the advancement of both the upper and lower jaw, often known as MMA, is major surgery that will change your appearance, sometimes this may be considered a positive.

It may be indicated where facial skeletal discrepancies are associated with sleep apnoea (confirmed by a sleep study) and is advocated for selected patients who have failed PAP and mouthpiece (oral appliance) therapy.

This type of surgery may have other unintended consequences; concerns, other than the surgery itself, include a change in your appearance, risk of nerve damage to the lower lip resulting in perhaps permanent loss of sensation (similar to numbness you may experience after a dentist visit) and two variables known as remodelling and relapse.

ACRONYM ALERT!
PAP = Positive Airway Pressure

JARGON ALERT!
Remodelling is where the soft tissue, that is attached to the bones of the face that have been moved, ‘remodels’ itself (changes its shape), perhaps reducing the benefit of the surgery.

Relapse is where the desired change in position of the bones of the face diminishes as the patient heals after the operation. Relapse is compensated for by over-correcting.

Both remodelling and relapse are effectively uncontrolled variables.

Further information can be found in the References section of the Appendix at the end of this Snorer.com Guide.
Things to discuss... when considering surgery for snoring & sleep apnoea

However, in general, MMA shows that the mild changes to facial profile / appearance are commonly an improvement. Those with severe obstructive sleep apnoea will usually have obstructions at multiple levels: nose, palate and base of the tongue. Advancement of the upper and lower jaw corrects obstructions at all levels.

Osteotomy

The cutting of bone is called ‘osteotomy’. Surgery can be performed on the lower, upper or both jaws to treat sleep apnoea, as well as other conditions. This is sometimes referred to as orthognathic surgery.

For sleep apnoea, this is commonly to advance (bring forward) the lower jaw (mandible) to support opening the airway.

If surgery is required on both jaws at the same time, it is called a bi-maxillary osteotomy (because bi-maxillary = both jaws). This is often called MMA.

This type of surgery, if performed on one jaw, will alter how your teeth fit together (your bite). This might be appropriate if your lower teeth are behind your upper teeth. If both jaws are moved together your bite may stay the same.
Things to discuss... when considering surgery for snoring & sleep apnoea

The surgical positioning adjustments of both jaws achieves a similar effect to multi-level surgery and may be considered an effective option when alternatives have failed or are not tolerated.

**Figure 9: Bi-maxillary Osteotomy**

This diagram shows how both jaws may be cut and repositioned to facilitate the opening of the airway, to resolve snoring and sleep apnoea. This surgery could be carried out on one or both jaws depending on what is needed to resolve the problem.

It is becoming increasingly recognised that MMA, although complex surgery, is one of the procedures capable of correcting severe OSA at all levels of obstruction, and is rapidly becoming the main surgical treatment for severe obstructive sleep apnoea, where CPAP has failed or is not tolerated and where mandibular advancement is helpful but not acceptable long term.

**JARGON ALERT!**
Multi-level upper airway surgery means, surgery upon many areas at the same time, to maximise effect.

**ACRONYM ALERT!**
MMA = Maxilla (upper jaw) Mandible (lower jaw) Advancement
OSA = Obstructive Sleep Apnoea
CPAP = Continuous Positive Airway Pressure
Things to discuss... when considering surgery for snoring & sleep apnoea

Hyoid suspension

The image below shows the hyoid bone in your throat – it is just above your thyroid cartilage your (“Adam’s Apple”).

Figure 10: Hyoid suspension

The hyoid bone is attached by a ligament to the lower jaw. Surgery moves the ligament attachment forward, moving the hyoid forward, which brings the base of the tongue and epiglottis forward, to open the airway.

Surgery moves the ligament attachment forward, which in turn pulls the hyoid forward.

This brings the base of your tongue and epiglottis forwards, which may then open your airway, (only at this level in your airway), and overcome your sleep apnoea.23

If oro-maxillofacial surgery to advance the lower jaw is carried out, this will move forward the hyoid in a similar way.

JARGON ALERT!
The epiglottis is a flap of cartilage located in your throat behind your tongue. It is usually upright allowing air to enter your lungs.

When you swallow, it folds backwards to protect the entrance to your lungs so that food and liquid do not enter.

After swallowing, the epiglottis returns to its original upright position.

Further information can be found in the References section of the Appendix at the end of this Snorer.com Guide.
Tracheostomy

Historically, before PAP therapy, tracheostomy was the preferred treatment for obstructive sleep apnoea. A tracheostomy is a surgical procedure where a surgeon creates an opening in your neck, at the front of your throat, into your airway (known as your trachea).

Once the tube has been inserted into your airway, you will breathe through this tube, instead of through your mouth and nose.

A tube is inserted into this opening to help you breathe. This is major surgery as it bypasses the area that is prone to collapse (your airway behind your tongue), hence it is a last resort, as it may affect your ability to talk.

This operation should only be considered when other options do not exist, have failed, are refused, or when this operation is deemed necessary by clinical urgency.  

Further information can be found in the References section of the Appendix at the end of this Snorer.com Guide.
Things to discuss... when considering surgery for snoring & sleep apnoea

Bariatric surgery

Being overweight or obese can detrimentally affect your life-expectancy. Excess weight is a significant contributing factor in sleep apnoea severity.

As obstructive sleep apnoea (OSA) has been estimated to be present in 40% - 90% of obese patients drastic options such as bariatric surgery to reduce the severity of sleep apnoea are now considered. This is serious surgery and should only be considered as a part of managing your overall care - thinking about more than just sleep apnoea. Bariatric surgery should only be considered in addition to PAP or mouthpiece (oral appliance) therapy.

It is indicated in patients with a BMI that is greater than or equal to 40 and in those with a BMI that is greater than or equal to 35 with other important medical problems (known as co-morbidities) who have found that changes in diet are inadequate.

These BMI boundaries are occasionally changed upwards by funding bodies.

After the operation your nutritional intake may need to be monitored by your Doctor/PCP as such you may need continual use of supplements and perhaps even vitamin injections. Additionally, some patients may experience insufficient or too much stomach acid which may require the use of long term medications.

ACRONYM ALERT!
BMI = Body Mass Index
Body Mass Index is a simple index of weight-for-height that is commonly used to classify underweight, overweight and obesity in adults. It is defined as the weight in kilograms divided by the square of the height in metres (kg/m²).

The World Health Organisation BMI classification is here:

ACRONYM ALERT!
OSA = Obstructive Sleep Apnoea

Further information can be found in the References section of the Appendix at the end of this Snorer.com Guide.
Neural stimulation

There is a new, relatively unproven, surgical 'quick fix' known as HGN (hypoglossal nerve stimulation). The idea is that as the individual can maintain their airway when they are conscious, provision of an electrical stimulus to the tongue muscle while the patient is asleep, should keep their airway open. A tiny pulse generator is implanted in your chest and a wire run up under the skin of your neck to the nerve in your tongue (known as the hypoglossal nerve). A sufficient electrical pulse is delivered to make you stick your tongue forwards enough to open your airway.

This is a new area and relatively unproven. Medical research trials are currently on-going, looking at two variations of this procedure.

One method requires perhaps more surgery as it needs the implanting of a 'sensing' lead to synchronise the electrical pulse to when you breathe in (inspiration).
The alternative approach, is to eliminate the sensing lead and avoid muscle fatigue, by varying where/how many sites of the tongue nerve receive the electrical impulse.\(^3\)(4)

While HGN is an exciting new idea, further research is required, to thoroughly validate this option. The HGN device that has been approved to US market entry (it had already received regulatory approval in Europe).

In short, in a subset of moderate to severe OSA patients that have failed PAP can be considered for HGN stimulation.
**Things to discuss... when considering surgery for snoring & sleep apnoea**

**Summary**

Soft tissue surgery may be considered firstly for what is known as ‘simple’ snoring and secondly for snorers with OSA to either facilitate PAP therapy or overcome the obstruction. Should these approaches prove inadequate oral & maxillofacial surgery may be an option to change the underlying structure of your face, move the bones and open up the airway.

Surgery for obstructive sleep apnoea should only be considered when more conservative options have not worked. It is essential that a thorough examination and review of all your options has been undertaken and you view the operation holistically, considering your likelihood of disease progression and possible changes in your weight.

Understanding of surgical options is improving and consequently historically performed operations (uvulopalatopharyngoplasty) are less commonly funded by insurers today, due to difficulty identifying suitable patients beforehand and other options being available.

New options such as hypoglossal nerve stimulation (HGN) require further research but look promising, while pillar implants into your soft palate are currently not recommended for OSA in the UK but in the USA they may be considered for mild-moderate OSA.

Oral & maxillofacial surgery, tracheostomy and bariatric operations are normally only considered when all other avenues have been explored or are not tolerated.

In conclusion, obstructive sleep apnoea patients need on-going, long term management. **OSA is a serious condition which affects many aspects of your life and health.** Your condition may change and you may then need a different approach to use a therapy, manage the side-effects or perhaps, should a complication arise.

**MEDICAL TERMINOLOGY!**

'Simple' snoring refers to snoring without obstructive sleep apnoea.
Things to discuss... when considering surgery for snoring & sleep apnoea

What next?

You might like to read the other Snorer.com Guides:

- Overview Guide
- Partner’s Guide
- How to choose... a mouthpiece to stop snoring
- How to choose... Positive Airway Pressure (PAP) therapy

Want to find out if you have sleep apnoea, but worried about the impact on your medical records? We suggest you consider the Snorer.com ASAP Anonymous Sleep Apnoea Process™ for anonymous home sleep testing for sleep apnoea.
Things to discuss... when considering surgery for snoring & sleep apnoea

Appendix

Acronym glossary

- BDS = Bachelor of Dental Surgery
- BMI = Body Mass Index
- DLO = Diploma in Laryngology and Otology
- ENT = Ear Nose Throat
- FDSRCS = Fellowship in Dental Surgery of the Royal College of Surgeons of England
- FDA = Federal Drug Administration (USA)
- FRCS = Fellow of the Royal College of Surgeons
- HGN = Hypoglossal nerve stimulation
- LAUP = Laser assisted uvulopalatoplasty
- LRCP = Locum Royal College of Physicians
- M Phil = Master of Philosophy
- MAD = Mandibular Advancement Device
- MAS = Mandibular Advancement Splint
- MBA = Master of Business Administration
- MMA = Maxillomandibular Advancement
- MRCS = Member of the Royal College of Surgeons
- MRD = Mandibular Repositioning Device
- NHS = National Health Service (UK)
- NICE = National Institute for Health and Clinical Excellence
- OSA = Obstructive Sleep Apnoea
- PAP = Positive Airway Pressure
- PCP = Primary Care Physician
- UK = United Kingdom
- UPPP = Uvulopalatopharyngoplasty
- USA = United States of America

JARGON ALERT!
These acronyms and others that you may come across are explained in the Snorer.com Jargon Buster!
https://snorer.com/jargon-buster/
Things to discuss... when considering surgery for snoring & sleep apnoea

References

Things to discuss… when considering surgery for snoring & sleep apnoea


21. Epstein LJ; Kristo D; Strollo PJ; Friedman N; Malhotra A; Patil SP; Ramar K; Rogers R; Schwab RJ; Weaver EM; Weinstein MD. Clinical guideline for the evaluation, management and long-term care of obstructive sleep apnea in adults. J Clin Sleep Med 2009;5(3):263–276.


Things to discuss... when considering surgery for snoring & sleep apnoea


30. Epstein LJ; Kristo D; Strollo PJ; Friedman N; Malhotra A; Patil SP; Ramar K; Rogers R; Schwab RJ; Weaver EM; Weinstein MD. Clinical guideline for the evaluation, management and long-term care of obstructive sleep apnea in adults. J Clin Sleep Med 2009;5(3):263–276.


Things to discuss... when considering surgery for snoring & sleep apnoea

Further reading

Monograph Sleep Apnoea (2010), chapter 17 and 18: http://erm.ersjournals.com/content/ermss/1.toc

Kotecha, B. T, Hall, A. C; “Role of surgery in adult obstructive sleep apnoea” Sleep Medicine Reviews 18 405e413, 2014


Arora, A. et al; “Outcome of TORS to tongue base and epiglottis in patients with OSA intolerant of conventional treatment” Sleep and Breathing - International Journal of the Science and Practice of Sleep Medicine, Volume 10, 2015


Support groups

United Kingdom

- Sleep Apnoea Trust Association: http://www.sleep-matters.org
- Scottish Association for Sleep Apnoea (SASA): http://www.scottishsleepapnoea.co.uk
- Irish Sleep Apnoea Trust: http://www.isat.ie
- Hope2Sleep: www.hope2sleep.co.uk

United States

- American Sleep Apnea Association: http://www.sleep-apnoea.org

Legal statements

All trademarks are owned by their respective companies and acknowledged.
Things to discuss... when considering surgery for snoring & sleep apnoea

Snorer.com gives you control

Control over how & when:

- Confidential access to independent information on snoring and sleep apnoea.
- How-to-Choose Guides without commercial bias.

Control over who knows:

- Anonymous, confidential access to sleep apnoea assessment.

Control over what:

- You control when and what to communicate about your results.

Authors & reviewers

Prof. Bhik Kotecha
M.Phil., FRCS, DLO

Professor Bhik Kotecha is the Clinical Lead for the Sleep Disorders Unit at the Royal National Throat, Nose & Ear Hospital, London. He has been in this role since 1998. He was born in Kenya and has been in UK since 1972. He has a medical degree obtained in 1984 in Cardiff and a Postgraduate M.Phil., from the University of Sussex.

He is a Fellow of Royal College of Surgeons of England, a Fellow of Royal College of Surgeons of Edinburgh and a member of Court of Examiners for Royal College of surgeons of England. Previously, he was President of Sleep Medicine Section at Royal Society of Medicine, London 2009-2011.

- Assistant Editor for Journal of Laryngology and Otology.
- NHS Consultant in ENT Surgery at Queens Hospital, Romford, Essex. (Barking, Havering and Redbridge NHS Trust) and Royal National Throat, Nose & Ear Hospital (UCLH) since 1995.
- Senior Lecturer at UCL since 1995.
- Associate Professor at AUC, School of Medicine, USA.
Things to discuss... when considering surgery for snoring & sleep apnoea

- Lectured nationally and internationally at various Sleep Medicine related conferences.
- Published widely in the field - see website for further information: www.snoringmanagement.co.uk.
- Appeared on various TV and Radio programmes to heighten the awareness of problems related to sleep disorders including, BBC Breakfast, BBC World, GMTV, Anglia Television and the Discovery Channel.

Prof. Ian Ormiston
FDSRCS, FRCS, FHKAM

Professor Ormiston is a Consultant Oral & Maxillofacial Cleft Surgeon. He is doubly qualified in Medicine and dentistry holding dental and medical/surgical fellowships, FDSRCS, FRCS and is also a Fellow of the Hong Kong Academy of Medicine.

While his dental and medical/surgical training were in the UK, much of his post medical maxillofacial training was under Professor Henk Tideman at University of Hong Kong.

He sits on the Board of Sleep Section of Royal Society of Medicine, London RSM.

He sits on the Board of British Society of Dental Sleep Medicine.

He is currently a consultant Oral and Maxillofacial Cleft Surgeon and also Head of service for the departments of Maxillofacial, Restorative Dentistry and Orthodontics at the University Hospitals of Leicester, UK.

He has recently (2017) been awarded a King James IV professorship from the Royal College of Surgeons of Edinburgh based on his body of work and publications involving sleep apnoea surgery.
Things to discuss… when considering surgery for snoring & sleep apnoea

Adrian Zacher MBA

Adrian Zacher has a wide ranging experience in medical devices for both conscious and unconscious respiratory medicine. He is a recognised pioneer, inventor, author, expert and serial entrepreneur.

Adrian pioneered the first commercial dental sleep medicine laboratory in Europe; ZSA Ltd. During the 11 years of successfully running ZSA, he invented a sleep device that could be adjusted to suit the individual needs of the wearer, winning an award for the device. He went on to co-found the British Society of Dental Sleep Medicine (BSDSM) and instigated and assembled the sleep medicine team which ultimately developed the Pre-Treatment Screening Protocol, which forms the benchmark for obstructive sleep apnoea screening in the UK. He continues to provide specialist dental sleep medicine knowledge to interested parties.

Adrian successfully completed his MBA in Oxford. After which, he was headhunted to lead international business development for a leading sleep business, working as subject matter expert on oral appliances and dental sleep medicine. He left in February 2012.

Adrian is often asked for advice and insight in the field of sleep medicine, recently co-authoring a chapter in Carranza’s Clinical Periodontology Expert Consult, and has completed the 2013 update.

Whilst taking time off as a new parent (truly appreciating the need for good quality sleep!) he started work on Snorer.com Ltd.

When not running Snorer.com, including Snorer.me (for patients), Snorer.business (for employers) and Snorer.training (for dentists), Adrian runs a LinkedIn group “The impact of sleep disorders on business” is a member of the British Sleep Society and a recent past Trustee of the charity Hope2Sleep that supports patients with sleep disordered breathing.
Important (but a bit boring) information...

All information provided in good faith.

**Snorer.com** has been certified by The Information Standard. When you see The Information Standard quality mark on any materials, you can be assured that organisation has undergone a rigorous assessment and that the information they produce is clear, accurate, impartial, evidence-based and up-to-date. This will help you make informed decisions, for yourself and for your family, when it comes to considering health and care options. For more information visit: [http://www.england.nhs.uk/tis/](http://www.england.nhs.uk/tis/)

Professional health care providers should always be consulted before utilising the information in this guide. The information is not intended to replace medical or legal advice. **Snorer.com** does not warrant that the information contained herein is in every respect accurate or complete, and is not responsible for any errors or omissions or for the results obtained from the use of such. **Snorer.com** makes every effort to ensure that it is as accurate and up to date as possible.

Readers are encouraged to confirm the information contained herein with other sources. **Snorer.com** makes no representations or warranties with respect to any treatment, action, or application of medication or preparation by any person following the information offered or provided within or through **Snorer.com** and will not be liable for any direct, indirect, consequential, special, exemplary, or other damages arising therefrom.

We encourage you to be careful when using medical information. If you are unsure about your medical condition, please consult a Physician. We strongly support providing patients with current, accurate medical information so that they are better able to make informed decisions about their health care.

Produced by **Snorer.com**

All rights reserved Snorer.com © 2014-2017
Images © artenot/www.shutterstock.com
Photos © individual shown
Line drawings © Snorer.com (unless otherwise stated)