

UP CLOSE

Get the answers to common
Ear, Nose, and Throat
conditions



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Foreword

ENT (Ear, Nose and Throat) conditions are extremely common and comprise up to 20% of adult and 40% of paediatric consults in a GP (general practitioner) clinic. The following chapters are a summary of the causes, symptoms, treatment options, as well as prevention of certain common ENT conditions. We are hopeful that you will find this collection of informational write-ups helpful in understanding your condition better.

As the large majority of ENT conditions can be managed in the primary healthcare setting, with the GP being the first healthcare port of call for the vast majority in the community, we also hope that our GP partners will find this booklet useful in your practice.

There have been numerous advances in all the various sub-specialty fields of ENT:

In Otology, modern day surgical hearing implants including cochlear implants, active middle ear implants and bone conduction implants have revolutionised the treatment of hearing disorders and ensured that every patient has a chance at good, if not excellent hearing.

In Rhinology, navigation-guided surgery and advances in endoscopic surgical techniques have not only made surgery of the paranasal sinuses safer, but it has allowed access to skullbase lesions

that previously required morbid open surgeries to access.

In Laryngology, there has been a wealth of new in-office procedures and also surgical advances to allow treatment of many types of voice disorders.

In Head and Neck Surgery, the use of novel surgical approaches allows the removal of benign and sometimes malignant head and neck lesions such as thyroidectomies to be performed truly without a scar.

In Sleep Apnoea Surgery, the use of the Trans-Oral Robot to perform tongue base surgery more effectively has led to significantly better outcomes for patients with severe Obstructive Sleep Apnoea.

With an entire team of extremely dedicated specialists trained in the best training centres around the world, complete with the medical technology and facilities, we at SingHealth hope to provide you with a range of extensive and seamlessly integrated services in our one-stop centre for the screening, diagnosis and treatment of ENT conditions. We aim to restore you to the best of health and aspire to be the best possible healthcare provider you deserve.

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Tinnitus

Tinnitus is the perception of sounds not generated in the external environment. It is common and many people will experience it at some point in their lives.

People with tinnitus often describe the sound as ringing, buzzing, swishing or clicking. While it can be disturbing to someone who has it, for many with tinnitus it is not a serious problem. Some, however, may require medical or surgical treatment.

Types of Tinnitus

- 1. Subjective tinnitus:** This is the most common variety of tinnitus. Only you can hear the sound. These include the sounds of crickets, roaring, buzzing, hissing, whistling and high-pitched ringing.
- 2. Objective tinnitus:** This sound can be heard by yourself as well as the doctor. It is less common and makes up less than 5% of cases.

Prevalence

Tinnitus is very common and many people will experience it at some point. Studies show that up to 10-15% of the population suffers tinnitus severe enough to seek medical attention. The prevalence increases with age. More men than women are affected.

Causes

Tinnitus itself is not a disease but may be a sign of damage in the hearing system or brain.

Hearing loss is the most common cause of tinnitus. Hearing loss can be due to normal ageing or trauma to the cochlea (the hearing organ) through noise, drugs, or chemicals.

It has been suggested that because the cochlea is no longer sending normal signals to the brain, the brain develops its own noise to make up for the lack of normal sound signals. This is interpreted as sound – tinnitus.

Loud noise exposure damages the hearing and is a common cause of tinnitus. Many people are unaware and unconcerned about the harmful effects of excessively loud noise at discos or from using earphones.

Anything that affects our hearing, such as an ear infection or excess wax in the ear can make tinnitus worse.

Subjective tinnitus

Meniere's disease is a common cause of subjective tinnitus. Someone suffering from this complains of fullness in the ear or hearing loss, roaring tinnitus and dizziness that can last for hours.

Acoustic neuroma is a rare cause of subjective tinnitus. It is a tumour that grows on the nerve that leads from the brain to the inner ear. The affected person usually notices the tinnitus and hearing loss in one ear, unlike the more common type caused by hearing loss that is usually felt in both ears.

Drugs such as aspirin (if overused) and some antibiotics are also other causes of tinnitus.

Objective tinnitus

Blood flow, either through normal or abnormal blood vessels near the ear is usually the cause of objective tinnitus. Causes of pulsatile tinnitus (tinnitus that corresponds to the heartbeat) include pregnancy, anaemia, an overactive thyroid gland, or tumours involving blood vessels near the ear (glomus tumour and arteriovenous malformation).

The narrowing of the carotid artery (a major blood vessel to the brain) can also cause pulsatile tinnitus.

Benign intracranial hypertension, a condition where an increase in the pressure of the fluid surrounding the brain causes pulsatile tinnitus.

Jaw joint misalignment problems or muscles of the ear or throat ‘twitching’ can cause clicking types of tinnitus.



- Hearing loss is the most common cause of tinnitus.

Symptoms

A person with tinnitus often complains of sounds of ringing, roaring, buzzing or chirping of crickets that may involve one or both ears. There may also be complaints of pulsatile tinnitus with associated symptoms that include hearing loss and dizziness.

Diagnosis

The ENT surgeon will take a complete history and physical examination of the head and neck including the various nerves in the area.

A hearing test (audiogram) will be performed. Depending on the symptoms and examination as well as the type of tinnitus, other

investigations may be needed. These can include either a special audiogram known as an auditory brainstem response (ABR), a brain scan such as a computerised tomography (CT) scan or magnetic resonance imaging (MRI) scan.

Treatment

Treatment for tinnitus depends on the underlyingly cause.

In most cases, tinnitus is caused by damage to the cochlea. There is normally no need for treatment in such cases other than reassurance.

If the patient is extremely bothered by the tinnitus, there are a number of treatment options.

Relaxation exercises help to control muscle groups and circulation throughout the body. This may reduce the intensity of tinnitus in some individuals.

Masking of the noise with a competing sound at a constant low level, such as a ticking clock, radio static (white noise) or soothing

sounds (rain, running water) may make it less noticeable, since tinnitus is usually more bothersome in quiet surroundings.

Hearing aids may reduce tinnitus while the patients are wearing them.

Medications that can be prescribed include tricyclic antidepressants and betahistine. Tricyclic antidepressants may have a role especially in patients with concomitant depression. Betahistine is a vasodilator that may improve blood circulation in the cochlea. Herbal medications and vitamins that have been advocated are ginkgo biloba and Vitamin B.

Tinnitus Retraining Therapy (TRT)

is a multimodality therapy that incorporates counselling, patient education and the use of low-level white noise tinnitus maskers. This therapy has shown significant promising results in certain studies.

Where the tinnitus is caused by other rare problems (such as a tumor or aneurysm), treatment of the tinnitus involves fixing the main issue. 🏹



- Relaxation exercises can help reduce the intensity of tinnitus.

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- Singapore General Hospital Tel: 6321 4377
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Ear Infections

The ear is divided into three parts: the outer ear (the pinna and external ear canal), middle ear (behind the ear drum) and inner ear (cochlea). Infections of the outer and middle ear are much more common than inner ear infections.

1. External Ear Infections

a. Otitis Externa

An infection affecting the external ear canal is called otitis externa, commonly known as 'swimmer's ear'. Anyone can get otitis externa.

Causes

The skin of the ear canal is normally protected by a waxy, water-resistant coating.

Bacteria living on the surface of the skin can cause otitis externa when there is a break in the skin's barrier. Trauma to the skin of the ear canal from cotton-tips or finger nails can result in a break in the barrier.

Someone who swims frequently is also predisposed to external ear infection. Prolonged exposure to moisture results in the water-resistant coating and skin becoming soft, allowing bacteria to infect the skin.

High humidity in tropical countries, like Singapore, ups the risk for external ear infections.



■ Frequent swimmers are at higher risk.

Diabetics are at higher risk due to poor immunity. They are also more prone to an aggressive form of infection called necrotising otitis externa (previously known as malignant otitis externa), in which the infection involves the skull bone.

Symptoms

- An itchy and/or painful ear with foul-smelling fluid discharge from the ear
- Hearing is often affected and you may complain of your ears being blocked
- The skin of the external ear will be red and swollen and extremely sensitive to touch

Prevention

The ear has a self-cleansing mechanism and clearing of wax with cotton-tips or any tools is unnecessary. Ear wax also has anti-bacterial properties that help to prevent ear infection.

If you swim regularly, it is important to make sure the ears are dried after a swim. Turning the head and gently pulling the ear in different directions helps to drain the water out of the ear.

Gentle use of cotton-tips may be necessary but it is not advisable to vigorously clean the ear. Ear plugs can be used to prevent water from getting into the external ear canal.

You can also prevent water from entering the ear canal in the shower by plugging the outside ear with a piece of cotton wool that is slightly soaked with baby oil.

Diagnosis

Otitis externa can be diagnosed from history and/or a physical exam. Cultures of the fluid or swabs of the ear may be necessary to identify the specific bacteria and the antibiotics that are active against it.

Occasionally, when the offending agent is a fungus, the infection is called Otomycosis. Spores and hyphae (an element of fungus) can be seen in the external ear canal.

Treatment

You can be treated by your family doctor with antibiotic ear drops. Occasionally, ear toilet by a specialist ENT surgeon is necessary. The ENT surgeon may insert an ear wick into the ear to allow the topical antibiotics to reach the deeper part of the ear canal. Some prescription drops may contain topical steroids which can help to rapidly reduce pain and swelling in the ear. Sometimes, oral pain medicines are necessary.

In patients with diabetes mellitus, intravenous antibiotics may be necessary for necrotising otitis externa.

b. Pinna Infection

The pinna is part of the outer ear. Infection can affect the pinna and the underlying cartilage leading to undesirable 'cauliflower' deformities.

Causes

Normal common bacteria resides on the skin of the pinna.

A breach of the skin can allow the normal bacteria that resides on the skin of the pinna to infect the skin and the underlying cartilage. Trauma to the pinna and cartilage is the most common cause of pinna infection.

If the infection involves the cartilage, it is called perichondritis. Sometimes the

infection is severe enough to destroy the cartilage and cause an abscess (pus collection).

Infection of the external ear canal may also spread to involve the pinna.

Symptoms

The affected pinna is red, swollen and painful. It is extremely painful to touch.

Diagnosis

The diagnosis is often evident from history and physical examination. A swab of the pus may be obtained.

Treatment

You will be admitted to hospital for intravenous antibiotics to prevent the infection from progressing into an abscess. If an abscess has already formed, it will need to undergo incision and drainage as well as daily cleansing and dressing. The abscess destroys normal cartilage and as it heals, the disordered new cartilage growth may lead to a deformity called 'cauliflower ear'.

Prevention

Ear piercing (especially through the cartilaginous part of the pinna) is not advisable as it can lead to perichondritis and pinna abscess.

2. Middle Ear Infections

The middle ear is the space behind the eardrum and is responsible for transmission of sound from the outer to the inner ear. Infection of the middle ear can be acute or chronic.

a. Acute Otitis Media

Acute Otitis Media refers to fluid in the middle ear with signs and symptoms of infection such as pain, fever, bulging eardrum and hearing loss.

Causes

The middle ear is connected to the back of the nose via a small canal called the eustachian tube. Bacteria can make their way into the middle ear via this canal where they are usually flushed out through the eustachian tube. Both bacteria and virus can infect the middle ear.

A blockage in the canal (usually due to a cold/flu), or when it does not function properly, can lead to germs getting trapped in the middle ear, causing an ear infection.

Children are predisposed to suffer from acute otitis media because of the anatomy and function of their ears and eustachian tube.

Risk Factors

Children are prone to ear infections because their eustachian canal is smaller and more horizontal. They tend to get more ear infections between 6 to 24 months. They are also more prone to upper respiratory tract infections such as colds and flus.

An ear infection, in itself, is not contagious but the upper respiratory viruses that cause the infection can spread amongst children. Therefore, children in day care are more prone to ear infections. Children who use pacifiers are also at risk.

Other risks factors include immature immune systems and factors that can cause the eustachian canal to be blocked are allergies, acid reflux, or environmental irritants like tobacco smoke.

Symptoms

- Young children tend to tug their ears if they have an ear infection because of the pain and accumulation of fluid in the ear.
- They may also cry, scream or are generally more irritable.
- Older children will be able to complain of pain and hearing loss.
- They will also tend to have fever.



- Children are prone to ear infections.

Diagnosis

The diagnosis of middle ear infection can be made on the history of symptoms and by examining the ears with an otoscope. The eardrums will be red and bulging in children with a middle ear infection.

Treatment

Most middle ear infections will resolve on their own, without antibiotics. A healthy, older child may be treated with painkillers and close follow-up. Antibiotics can be given if the symptoms are severe, persist, or worsen.

Antibiotics may also be given to children who are young or at risk for complications to help resolve the infection, reduce pain and prevent

complications. Once antibiotics are given, the fever and pain should improve or resolve within 48 to 72 hours.

Painless fluid in the middle ear may last for a few weeks or months after an acute infection. It may be necessary to drain the fluid if it fails to drain by itself.

Symptomatic relief of upper respiratory infection symptoms (running nose, blocked nose) with antihistamines or nasal decongestants may be given.

Complications

Complications such as acute mastoiditis, meningitis and brain abscess arising from middle ear infection are now rare because of antibiotics usage.

Prevention

It is impossible to prevent middle ear infection totally. However, some useful measures include:

- a. Discourage the use of pacifiers as this predisposes the child to middle ear infection. Also avoid letting the child drink while lying flat on his back.
- b. Wash hands and clean toys frequently as the viruses that cause upper respiratory tract infections (flu/cold) can be transmitted by contact.

- c. Avoid being in a small room with other sick children or adults as respiratory tract infections can also be spread through the air.
- d. Breastfeeding is very useful in reducing the number of ear infections. A child should be nursed throughout the first year. Even a few weeks of breastfeeding can result in fewer ear infections.
- e. Vaccinate your child with the pneumococcal and flu vaccines as they help in the prevention of ear infections.
- f. Treat your child for allergies and avoid exposure to cigarette smoke.
- g. Ensure that the child gets sufficient sleep and good nutrition.

b. Chronic Suppurative Otitis Media

Chronic middle ear infection can cause persistent foul-smelling ear discharge and hearing loss. This is due to a perforation of the eardrum and recurrent infection of the middle ear. The ear perforation is usually the result of previous trauma or infection.

In most instances, the eardrum will heal, but occasionally the perforation persists. It is important to ensure that the patient does not have cholesteatoma.

Symptoms

Recurrent ear discharge, pain and hearing loss are the most common symptoms. The ear discharge and pain are due to infection and hearing loss due to perforation of the eardrum and occasionally, erosion of the ossicles in the middle ear.

Part of the skin of the ear grows into the bone of the middle ear in someone with a cholesteatoma. With chronic infection and as the cholesteatoma grows, it can cause chronic ear discharge, hearing loss, facial paralysis and even meningitis and brain abscess.

Diagnosis

Diagnosis is made from history and examination with an otoscope. An ear perforation can be easily seen. From the exam, the doctor will be able to ensure that you do not have a cholesteatoma.

A hearing test (audiogram) is often necessary. If cholesteatoma is suspected then a CT scan of the temporal bone may be ordered.

Treatment

You will be advised to keep your ear dry and topical antibiotics will be



■ Common symptoms: ear discharge and pain.

prescribed. It may be necessary to obtain some ear discharge to culture for bacteria so that the species of bacteria can be identified and the most appropriate antibiotic prescribed.

Surgical treatment such as myringoplasty, tympanoplasty or ossiculoplasty may be needed to repair the eardrum and/or to reconstruct the ossicles if there is troublesome discharge or the hearing loss is significant.

Surgical treatment of cholesteatoma is necessary. The surgical procedure, tympanomastoidectomy, involves removal of the cholesteatoma, the affected bone and the middle ear structures. 🍷

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Hearing Loss

Hearing loss occurs when there is a problem with one or more parts of the ear.

In air conduction, sound waves travel through the external ear canal to vibrate the eardrum. Vibration of the eardrum is transmitted to the hearing organ (cochlea) via three small bones (ossicles) in the middle ear. This stimulates the sensory cells in the cochlea which then sends impulses to the hearing nerve (auditory nerve) and on to the brain.

Hearing by bone conduction occurs when sound waves cause the bones of the skull to vibrate which directly stimulate the hearing organ (cochlea) resulting in hearing.

Causes

There are 2 types of hearing loss:

Conductive hearing loss occurs when sound waves cannot be transmitted properly from the external environment to the cochlea. The problem could lie in the external ear canal, eardrum, middle ear bones or middle ear space.

Common causes of conductive hearing loss include:

- Obstruction in the external ear canal caused by wax, foreign body or infection (otitis externa)



■ Loud noise damages your hearing.

- Perforated eardrum – usually a result of trauma or chronic infection
- Dislocated, damaged or fixed ossicles (malleus, incus, or stapes) – from trauma or chronic diseases that erode the ossicles over time or otosclerosis that cause the ossicles to be fixed
- Otitis media – a middle ear infection, usually with fluid in the middle ear space

Sensorineural hearing loss occurs when there is damage to the hearing organ (cochlea) or hearing nerve (auditory nerve).

Common causes include:

- Ageing (presbycusis)
- Acute and chronic exposure to loud noise can cause damage to the sensory cells in the cochlea.
- Infections of the inner ear by viruses and bacteria such as mumps, measles and influenza.
- Meniere's disease – a disease that causes tinnitus, hearing loss and dizziness
- Acoustic neuroma – a tumour of the vestibular nerve, which lies in close proximity to the auditory nerve and affects its function
- Ototoxic drugs – Some drugs can damage the nerves involved in hearing or the sensory cells in the cochlea. Examples include:
 - i. Antibiotics including aminoglycosides (gentamicin, vancomycin),
 - ii. Diuretics including frusemide
 - iii. Antineoplastics (cancer drugs)

Symptoms

- Hearing loss may be gradual or sudden and can affect one or both ears.
- The affected person usually complains of difficulty in holding a normal conversation, especially in a noisy environment. There may



- You may have difficulty holding a normal conversation.

be complaints from others around that the person does not respond when called or speaks louder than normal.

- There may be associated symptoms like tinnitus (ringing in the ears) or vertigo (spinning sensation).
- Pain and discharge from the ear is often associated with ear infections.

Prevention

Noise-induced hearing loss is usually irreversible and progresses with each exposure. People who work with heavy machinery or in the construction industry should use proper ear protection when working around loud noises, especially when working for prolonged periods. They should also undergo regular hearing tests to ensure that their hearing is not worsening.



■ Say NO to earphones and loud music.

Young people should refrain from using earphones at high volumes, and limit prolonged exposure to loud music to prevent premature damage.

Diagnosis

A complete history, ENT examination and relevant investigations are necessary for a diagnosis.

The ENT physician will perform a thorough head and neck examination, particularly of the ear canal and tympanic membrane. An endoscopic examination of the nose and nasopharynx may also be necessary. Occasionally, a neurologic examination will be done.

A hearing test (audiogram) will be performed to confirm the presence and indicate the severity and type of hearing loss. A tympanogram may also be performed to detect problems of the eardrum and middle ear.

Radiological imaging studies such as CT scans or MRIs (magnetic resonance imaging) may be ordered to detect an acoustic neuroma.

Treatment

Medical

Medical treatment depends on the underlying problem. Treatment may range from observation and reassurance to medications and a discussion on surgical options.

If the cause of hearing loss is due to wax and foreign body in the ear canal, it can be removed under a microscope by the ENT surgeon.

In cases of external ear infections, topical antibiotic is needed. If there is an eardrum perforation, the underlying infection has to be treated. Surgical repair of the ear perforation may be necessary if the perforation persists for more than 3 months or there is a problem of recurrent ear infections with ear discharge.

If the cause of the hearing loss is due to medication, the medication will be stopped or changed.

For presbycusis (hearing loss due to old age) no treatment is needed although the affected individual will be advised to protect his hearing and evaluated on whether hearing aid help is needed.

Hearing aids

Conventional hearing aids are amplification devices that detect environmental sounds and present and amplify them into the external ear canal. They are useful for both conductive as well as sensorineural hearing loss.



- Modern aids are small enough to be placed completely in the ear canal.

The modern aids vary from very small completely-in-the-canal to the traditional behind the ear hearing aids. A trained audiologist will help customise the hearing aid for optimal sound.

The side effects from wearing hearing aids include occlusion effect (sense of blockage of the ear), feedback and a propensity for ear infections.

Hearing implants

With advances in technology, implants to aid hearing have been developed. Two main types of surgical implants are available:

Middle ear implants are used in people who have tried hearing aids but are unable to use them or fail to benefit from them. It can be used for those with sensorineural hearing loss and conductive hearing loss. It comprises of a transducer that is attached to the ossicles or directly to the round window (part of the cochlea). It vibrates the middle ear structures and amplifies the transmission of sound.

Cochlear implants are used in someone with moderate to severe sensorineural hearing loss. The ENT surgeon will insert the electrical electrode of the implant directly into the cochlea and directly stimulate the nerve endings in the cochlea so as to bypass any problem in the cochlea. Cochlear implants are used in both paediatrics and adults. 🍷

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Rhinitis

Rhinitis is a condition where the mucous membrane in the nasal cavity is inflamed.

Causes

It is a common condition that may be caused by an infection, an allergic response or even overuse of certain medications.

Infective rhinitis is usually caused by viruses and results in the common cold.

Symptoms

Symptoms of rhinitis include:

- Sneezing
- Nasal obstruction
- Sensation of a stuffy nose
- Runny nose

Treatment

Infections usually resolve on their own over a few days. Medical treatment is usually targeted at symptom relief. Antihistamines or nasal decongestants may be prescribed to alleviate symptoms of the disease.



■ Treatment for rhinitis aims for symptom relief.

Nasal decongestants like oxymetazolin, work by constricting the blood vessels in the mucosal lining. It is important to note that prolonged use of such decongestants may result in rebound symptoms (return of symptoms being treated which is now more severe than before) and worsening of the nasal obstruction. This is a condition known as rhinitis medicamentosa. 🍷

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Allergic Rhinitis

Allergic rhinitis is caused by the body's immune response to an environmental trigger.

Causes

Common triggers include house dust mites, pollen and airborne moulds.

Symptoms

Symptoms include:

- Blocked nose
- Runny nose
- Post-nasal drip as well as watery and itchy eyes

These occur after exposure to the allergen. For example, walking into a dusty room may cause such symptoms to develop.

Diagnosis

There is often a history of other allergies and sensitive skin and some people may also have asthma.

A **skin prick test** may be able to identify the offending allergen (substance that triggers the allergic response). It is a simple test performed in the clinic.

In a skin prick test, a small area of skin, usually on the forearm is used to test for allergies to various allergens. A small amount of allergen is then applied to the skin and the area observed for a positive reaction.



■ A skin prick test can identify the cause of allergy.

By identifying the allergen, severe or recurrent attacks can be reduced by avoiding or minimising subsequent exposure to the allergen. Common allergens include dust mites and pollen.

Treatment

Treatment of allergic rhinitis is aimed mainly at reducing the severity and frequency of attacks.

Methods of management can be divided into:

Environmental control. Changes to the living environment will have to be made to avoid the allergens that trigger attacks. For example, frequent cleaning of living areas and replacing items such as carpets or stuffed toys may reduce the amount of exposure to dust mites in the house.

Medical therapy. Medical therapy is directed at controlling symptoms and reducing the allergic response.

In cases where symptoms are intermittent, antihistamines may be prescribed. Where attacks are frequent, a nasal steroid may also be added.

Nasal steroids are widely used because they are effective for long-term control of symptoms and are safe for long-term use as they have a topical action and very little of the steroid actually gets absorbed by the body.

Surgical therapy. Surgical therapy may be useful where there are anatomical abnormalities such as a deviated nasal septum, or inferior turbinate hypertrophy.

Surgery may improve the symptoms of congestion and blockage, but may not have any impact on the other symptoms such as runny nose or itchy eyes. Nasal steroids may still have to be used to control these symptoms.

Immunotherapy. It is also suitable for a select group of people with severe, prolonged symptoms that do not respond to conventional therapy.

In immunotherapy, the body's immune system is modulated to reduce the response to the allergen, thus reducing the severity of symptoms. This is a slow

process and will require injections or self-administered drops taken regularly over a period of 1 to 3 years.

Other Types of Rhinitis

Other less common types of rhinitis include:

Atrophic rhinitis

In atrophic rhinitis, the natural mucosal membrane is thinned out and the glands that secrete mucus and participate in mucus clearance are lost. This leads to secondary infections and persistent crusting of the nose.

This is a rare condition that occurs in those who have undergone aggressive surgery to the nasal cavities.

Vasomotor rhinitis

Vasomotor rhinitis is a condition where there is chronic rhinitis in the absence of an identifiable allergy.

Dilation of blood vessels in the nose is partly controlled by the autonomic nervous system. It is believed that an oversensitivity of this autonomic nervous system can cause vasomotor rhinitis. In some cases, the trigger may be a change of temperature or the presence of a chemical stimulant like strong perfume or chemical fumes. 🍷

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Sinusitis

Sinuses are naturally occurring air-filled spaces in the skull. Each sinus is covered with a mucosal covering. The sinuses are all connected to the nose and mucus produced in the sinuses naturally drain out through the nose.

In sinusitis, the mucous membranes become inflamed and swollen. This obstructs the flow of mucus out of the sinuses and leads to build-up of mucus in the sinuses leading to sinusitis.

Causes

Viruses are the most common cause of sinusitis and these infections usually resolve fairly quickly with just symptomatic treatment.

Bacterial sinusitis usually has a longer duration of symptoms and may be treated with oral antibiotics.

Fungal sinusitis is the least common of the three and usually occurs in those with a weakened immune system.

Some pre-existing conditions may make an individual more likely to suffer from sinusitis, these include anatomical abnormalities of the nose, uncontrolled allergic rhinitis, and those with depressed immunity and some tooth infections.

Complications

Occasionally, complications may arise from untreated sinusitis. This occurs

when the infection spreads. These complications include meningitis, infections to the eye and worsening of pre-existing asthma.

Symptoms

Symptoms of sinusitis include:

- Difficulty breathing through the nose
- Fever
- Throbbing pain in the cheek, forehead area between the eyes
- Sensation of heaviness in the head
- Sensation of fullness in the face
- Thick yellowish or greenish nasal discharge – there may be mucus dripping to the back of the throat, often causing a cough that is worse on lying down

Some people may also experience aching pain in the jaw, teeth or ears or a reduced sense of smell and taste.

Other general symptoms include:

- Bad breath
- Fever
- Nausea
- Fatigue

In situations where there is significant inflammation of the mucosa membrane, the drainage pathway may be blocked, leading to trapping of mucus within the sinuses. This leads to

the symptoms of blocked nose, nasal congestion, facial pain as well as foul-smelling discharge. The cause may be viral, bacterial or fungal in nature.

Diagnosis

A nasoendoscopic examination may be performed to access the drainage pathways of the sinuses.

The nasoendoscope is a small tubular flexible scope that is introduced into the nose to visualise the nasal passages. It is not a painful procedure but some patients may experience a little discomfort. An examination of the nasal passages will also reveal the presence of any purulent nasal discharge.

In cases of persistent sinusitis, a specimen of the discharge may be taken for culture to identify the bacteria and help in the selection of antibiotics.

A computed tomographic scan (CT scan) may also be done to show any anatomical abnormalities that may lead to recurrent or prolonged episodes of sinusitis.

Treatment

Acute sinusitis

Acute sinusitis may be treated with

antibiotics and decongestants. The aim is to control the infection, reduce the mucosal inflammation and restore the natural mucus flow in the sinuses.

Chronic sinusitis

In chronic sinusitis, the obstruction may not be completely reversed with medications and some form of surgery may be necessary to reverse the disease process. Hence, some cases of chronic sinusitis or recurrent sinusitis may need surgery in the form of a Functional Endoscopic Sinus Surgery (FESS).

Most sinus surgeries are performed through the nose with the aid of scopes and specialised instruments that enable the procedures to be done with no external scars. ✓



■ Sinusitis is often treated with antibiotics and decongestants.

Specialist services available at the following institutions:

- Singapore General Hospital Tel: 6321 4377
- KK Women's and Children's Hospital Tel: 6294 4050 (Services for women and children)

Nasal Polyps

Nasal polyps are the result of chronic inflammation within the nasal cavity. They are benign growths and are not cancerous.

Causes

The exact cause is not known but any condition that causes chronic inflammation in the nasal cavity or sinuses may increase the risk of nasal polyps.

There may be an allergic component to the disease as some people with nasal polyposis test positive for an environmental allergen.

Asthma and aspirin sensitivity are other conditions that are often associated with nasal polyps.

Symptoms

The polyps result in fleshy lumps within the sinuses and nasal cavity that may completely obstruct the nasal passage, giving rise to the sensation of nasal obstruction.

Other symptoms include:

- Decreased sense of smell
- Complete loss of smell
- Excess nasal secretions

If the polyps lead to obstruction of the sinuses, it may lead to sinusitis, which is an infection of the sinuses.

Prevention

To help reduce the chances of developing nasal polyps or recurrences, it is important to avoid any irritants and allergens as much as possible, and to manage any allergies or asthma, if present.

Diagnosis

A nasoendoscopic examination may be done to confirm the presence of polyps as well as to evaluate the extent of disease. Your doctor may also suggest allergy skin tests to find out if there are any allergies that may be contributing to the chronic inflammation.

A computed tomographic (CT) scan of the sinuses may be done to determine the extent of the polyps in some cases, as well as to identify any other possible obstructions within the nasal cavity. The scan is also useful if surgery is needed.

Treatment

Anyone with nasal polyps should stop smoking. Early polyps may be treated with oral or nasal medications. Other medications may include antihistamines or antibiotics to treat a chronic or recurring infection.

Surgery may be necessary if medication does not shrink or eliminate the polyps, or if there is suspicion of cancerous growths. The type of surgery will depend on the extent as well as the size of the polyps.

Generally, surgery is in the form of endoscopic surgery. The surgery is usually performed under general anaesthesia and involves the use of a scope inserted into the nose to

help the surgeon as he guides small instruments into the nostril and sinus cavities to remove the polyps, and clear any obstruction which may prevent the flow of secretions from the sinuses.

After surgery, your doctor may recommend the use of nasal steroids to prevent the recurrence of polyps as well as nasal washes to prevent the accumulation of dried mucus or crusting in the nose. 🍷



- Avoid any irritants and allergens as much as possible.

Specialist services available at the following institutions:

- Singapore General Hospital Tel: 6321 4377
- KK Women's and Children's Hospital Tel: 6294 4050 (Services for women and children)

Laryngopharyngeal Reflux

Laryngopharyngeal reflux (LPR) occurs when stomach acid back-flows into the food channel (oesophagus) and into the throat and voice box (larynx).

Causes

There are two sphincter muscles in the oesophagus – the lower oesophageal sphincter (LES) and upper oesophageal sphincter (UES).

The LES is a muscle that prevents backflow of food and acid from the stomach into the oesophagus. The UES is a muscle that prevents food and acid in the oesophagus from back-flowing into the larynx. When the LES is weak and does not close tightly, you will have gastrooesophageal reflux disease or GERD.

If acid (and digestive enzymes) from the stomach back-flows into the larynx, you will have laryngopharyngeal reflux (LPR).

Symptoms

- Frequent throat clearing
- Throat itchiness
- Sensation of something in the throat
- Excessive phlegm in the throat
- Hoarse voice
- Frequent sore throat



- History, physical exam and sometimes, tests are needed for diagnosis.

- Chronic cough
- Heartburn

Diagnosis

A diagnosis of LPR is achieved with a combination of detailed history, physical examination and occasionally some tests. Procedures that may be performed to diagnose this condition include:

- **Fibreoptic nasoendoscopy.** A thin scope with a camera attached at the end of it is passed through the nose down to the level of the voice box in the throat under local anaesthesia.
- **Barium swallow.** An X-ray test in which you swallow a dye and serial X-rays are taken to assess the flow of dye from oesophagus to stomach. The dye will line the cavity of the oesophagus and

stomach and allow detection of large growths. The serial X-rays can also detect reflux of the dye into the oesophagus.

- **24-hour pH probe testing.** This procedure is used to evaluate the amount of stomach acid that back-flows into the oesophagus and larynx. Two pH sensors (sensors that measure acidity of gastric contents) are used. One is located at the lower end of the oesophagus just above the LES and the other at the upper oesophagus or just above the UES.
- **Upper gastrointestinal endoscopy and transnasal oesophagoscopy.** These procedures involve passage of a scope through the mouth or nose, into the oesophagus and stomach. In transnasal oesophagoscopy the scope can be passed through the nose with minimal discomfort and no sedation.

It allows visualisation of inflammation of the oesophagus due to acid reflux, hiatus hernia which may indicate a weak LES and also abnormal growths in the oesophagus and stomach. A sample can be taken (biopsy) if necessary to exclude cancer or infection.

Treatment

The treatment of LPR is essentially similar to the treatment of gastrointestinal reflux disease (GERD). It consists of lifestyle modifications, dietary modifications, anti-acid medication, and rarely surgery.

1. Lifestyle modifications

Eat smaller, more frequent meals. A large meal will expand your stomach and increase upward pressure against the oesophageal sphincter.

Limit your intake of acid-stimulating foods and beverages. Refer to dietary modifications outlined on the following page.

Do not lie down for 3 hours after you eat. Lying flat makes it easier



- Keep to a reasonable weight.

for the stomach contents to enter the oesophagus. When sleeping, it sometimes helps to have the head higher than the stomach. This can be achieved by raising the head of the bed or using a mattress wedge.

Maintain a reasonable weight. Being overweight increases the pressure in the abdomen which can push the stomach contents against the LES.

Do not smoke. Nicotine in cigarettes relaxes the oesophageal sphincter. Smoking also stimulates production of stomach acid.

Do not wear tight clothing or belt around the waist. This can squeeze the stomach, forcing its contents into the oesophagus.

2. Dietary modifications

Avoid or reduce intake of spicy and 'heaty' foods such as chilli, peanuts and chocolate. Fried foods, oily foods and sugary foods like ice-cream should also be avoided. Drinks such as orange and grapefruit juice, fizzy drinks, milkshake, coffee, tea and alcohol can also worsen reflux and should be avoided.



■ Reduce intake of acid-stimulating foods and drinks.

3. Medications

Medications can help reduce acid production in the stomach, promote gastric emptying, or protect the oesophagus lining from injury.

Medications to reduce acid production include proton pump inhibitors (e.g. omeprazole) and histamine receptor agonists (e.g. ranitidine). Prokinetic agents such as domperidone can also be prescribed to promote gastric emptying, and help clear acid from the stomach. Antacids such as Gaviscon can create a protective layer that shields the oesophagus from injury by stomach acid and digestive enzymes.

4. Surgery to prevent reflux

Surgery may be indicated in severe LPR that does not respond to maximal medical therapy and lifestyle/dietary modification. The surgery is performed to tighten the junction between stomach and oesophagus. The

procedure known as Nissen

Fundoplication involves wrapping the top part of the stomach around the junction between stomach and oesophagus and securing it in place. 🍷

Specialist services available at the following institutions:

- Singapore General Hospital Tel: 6321 4377
- KK Women's and Children's Hospital Tel: 6294 4050 (Services for women and children)

Acute Pharyngitis and Tonsillitis

Acute pharyngitis and tonsillitis occur when the pharynx and tonsils become infected with viruses or bacteria.

They are common ailments that cause sore throat and the tonsils to become swollen and painful.

Causes

The pharynx and tonsils have lymphoid tissue (white blood cells) that form part of the defense mechanism against viruses and bacteria that enter the body through the nose or mouth.

Pharyngitis and tonsillitis are caused mainly by viruses. Less often, it may be the result of bacterial infection and antibiotic treatment will be required.

Most cases of sore throat are the result of acute pharyngitis. Tonsillitis occurs when the infection gets more serious, and the tonsils become painful and inflamed.

Tonsillitis caused by viruses

The majority of tonsillitis are caused by viruses (like Adenovirus, Influenzae viruses, Parainfluenzae virus, Respiratory Syncytial Virus, etc) that can affect the upper respiratory tract, including the virus that causes infectious mononucleosis (the Epstein-Barr virus). Tonsillitis can also be caused by bacterial infections (like Streptococcus species, Staphylococcus species).

Acute tonsillitis caused by the Epstein-Barr virus can cause infectious mononucleosis. It is also called 'kissing disease' because of its spread via saliva and it commonly affects adolescents and young adults.

It is characterised by:

- Sore throat
- Fever
- Enlarged cervical lymph nodes
- Enlarged tonsils and fatigue
- Other clinical manifestations are splenomegaly (enlarged spleen), hepatomegaly and hepatitis (enlarged liver and inflammation of the liver) and low platelet and white blood count.

Tonsillitis caused by bacteria

Acute tonsillitis due to a specific type of bacteria (Group A Streptococci) is called strep throat.

Symptoms caused by strep throat include:

- A sudden onset of pain and pain on swallowing
- Tender lymph glands in the neck
- High spiking fever
- A lack of upper respiratory tract symptoms (like running nose, nasal blockage)

As most cases of tonsillitis are caused by viruses, symptomatic treatment

with painkillers, fever medications and hydration is enough. However, if the infection is caused by strep throat or another bacterial infection, treatment with antibiotics is needed.

School-going children are prone to viruses and bacteria that cause upper respiratory tract infection and tonsillitis. These tend to get passed on in childcare centres and schools where children are in close proximity.

Symptoms

Signs and symptoms of pharyngitis include:

- Sore throat
- Fever

If tonsillitis occurs, you may experience:

- Severe sore throat
- Painful and difficult swallowing
- Referred pain to the ear
- Fever and chills
- Loss of voice (due to inflammation of voice box)
- Headache
- Tender and enlarged lymph glands in the neck
- Red and swollen tonsils and white patches on the tonsils



- Bacteria and viruses spread faster in places with children in close proximity.

Complications

Acute tonsillitis itself is usually not serious but can lead to complications if left untreated. Swollen tonsils can block the airway and cause airway obstruction leading to sleep apnoea.

The infection may spread to the surrounding tissue and neck and result in the collection of pus between the tonsil and tissues around it (peritonsillar infection and abscess).

It can also spread to the neck causing pus collection in the neck (parapharyngeal abscess and retropharyngeal space abscess). You can present with difficulty swallowing, drooling, stiff neck or pain and difficulty breathing.

Prevention

- The viruses and bacteria that cause pharyngitis and tonsillitis are contagious. Personal hygiene is important to prevent infections and frequent hand washing is the best way. Wash your hands often, and encourage your children to do the same.
- Other precautionary measures include not sharing drinking glasses or eating utensils, covering the mouth when sneezing or coughing and avoiding close contact with anyone who is sick.
- Parents should keep their children at home if they are sick to prevent spread.



- Wash hands often to stop the spread of infection.



- A throat swab may aid in diagnosis.

Diagnosis

The diagnosis of tonsillitis and its complications can be made by the history, physical examination and relevant radiological investigations. The doctor may order a full blood count or throat swab.

Treatment

Acute tonsillitis caused by a virus is usually self-limiting and symptomatic treatment is sufficient. However, if the tonsillitis is caused by a bacterial infection, antibiotics may be prescribed that needs to be completed. Stopping the antibiotics prematurely may lead to the bacteria developing a resistance to it.



- Drink lots of water to prevent dehydration.

Self-care

Most cases of tonsillitis are caused by viral infections and antibiotics are not necessary. It is usually self-limiting and symptomatic treatment to relieve pain and inflammation is all that is required. It takes about a week for full recovery.

Drinking lots of water to prevent dehydration is usually advised.

- Drink warm, soothing liquids – such as soup, broth and tea.
- Gargle with warm salt water.
- Take paracetamol or ibuprofen to help reduce fever and decrease pain.

Children should not be prescribed aspirin because of the risk of Reye's syndrome – a potentially

life-threatening illness causing encephalopathy (brain damage) and fatty liver.

Persons diagnosed with infectious mononucleosis should not exert themselves or engage in strenuous activity for a month for fear of splenic rupture.

Surgery

Surgical removal of the tonsils (tonsillectomy) for tonsillitis may be recommended when a patient has:

- Seven or more serious throat infections in 1 year
- Five or more serious throat infections every year over a 2-year period
- Three or more serious throat infections every year over a 3-year period
- Chronic tonsillitis

Tonsillectomy may also be recommended to treat an abscess that does not improve with antibiotic treatment, or if breathing is blocked by swollen tonsils.

A complete recovery may take up to 2 weeks. 🍷

Specialist services available at the following institutions:

- Singapore General Hospital Tel: 6321 4377
- KK Women's and Children's Hospital Tel: 6294 4050 (Services for women and children)

Thyroid Nodules

The thyroid is a butterfly-shaped gland located just below your Adam's apple, with its wings on either side of your windpipe. It produces thyroid hormone, which controls your metabolic rate.

Causes

The exact cause of thyroid nodules is not known, but the following factors may be involved:

- A lack of iodine in your diet
- A thyroid condition such as goitre or hypothyroidism, in particular Hashimoto's thyroiditis
- Exposure to radiation treatments
- A history of thyroid nodules in your family

Is your neck lump a thyroid nodule?

If you have a lump in the middle of your neck (below your Adam's apple) or just off the centre, which moves with swallowing, it is probably a thyroid nodule. Your doctor will be able to confirm this finding.

The lump you feel may be either a solitary nodule or a dominant nodule in a background of multiple nodules, or even a diffusely enlarged thyroid gland.

Symptoms

Thyroid nodules usually do not cause symptoms, but some symptoms include:

- Pain – if there is bleeding into the nodule or inflammation.
- Difficulty swallowing or breathing – if the thyroid gland or nodule is large.
- Hyperthyroidism symptoms like heat intolerance, fast heart rate, weight loss and tremors – if the nodule produces excessive thyroid hormone.
- Hypothyroidism symptoms including cold intolerance, lethargy, weight gain and weakness – if less thyroid hormone is produced.
- Hoarseness – if there is a cancer invading the nerve supplying your vocal cords. This symptom warrants immediate attention.



- Symptoms include pain and difficulty swallowing or breathing.

Prevention

In Singapore where iodine deficiency is not a problem, there are no preventable causes of thyroid nodules or goitre. Radiation is a risk factor for thyroid cancer, but this is a rare occupational or treatment risk for a small group of individuals.

Diagnosis

Fine needle aspiration cytology (FNAC) – A minor procedure performed in the clinic, a fine needle is inserted into the nodule and cells are withdrawn for evaluation. You will be able to return home or to work immediately. The test aims to determine if your thyroid nodule is cancerous, but the result is occasionally inconclusive.

Ultrasound – Sound waves are used to form a picture of the thyroid gland. It allows your doctor to determine if your thyroid nodule is solid, cystic (fluid-filled) or mixed, the number of nodules and also to take measurements to track the growth of the nodules.

Most importantly, it allows the doctor to identify features that may be suggestive of cancer, including microcalcifications, internal vascularity and hazy boundaries, possibly from invasion of surrounding tissue. It may

also be used to help locate nodules and to guide the needle in FNAC for more representative results.

Thyroid scan – A small amount of radioactive iodine is administered orally. It is taken up by functioning thyroid cells, which will show up on a scan.

Functioning nodules are less likely to be cancerous. Cold nodules or non-functioning nodules require further evaluation with FNAC.

Thyroid function test – A blood test to determine the level of thyroid hormone and thyroid stimulating hormone. It may be useful if you have hyper or hypothyroid symptoms or if you require surgery.

Treatment

This depends on the nature of the nodule, whether it is benign or malignant and also if it causes symptoms.

Cancer – Surgery is the treatment of choice. Depending on the size of the tumour, either half or the entire thyroid gland may need to be removed. Additional treatment like radio-iodine treatment or radiotherapy may be necessary.

Benign nodules – may be observed if not causing any symptoms. Follow-up of the nodules is usually by ultrasound.

The interval will be decided by your doctor.

Surgery is an option if symptoms are present, including difficulty swallowing or breathing, or even just to remove the unsightly lump.

Indeterminate – if the nature of the nodule is indeterminate on FNAC, your doctor will discuss with you the options of close observation versus surgery. The risk of your nodule being cancerous depends on the exact findings on ultrasound and FNAC.

How is thyroid surgery performed?

Thyroid surgery is performed under general anaesthesia. It may be:

- **Hemithyroidectomy** – removal of half the thyroid gland. For benign nodules or small cancers.
- **Total Thyroidectomy** – removal of the entire thyroid gland. For larger cancers, nodular goitre or toxic goitre including Graves disease.

Your surgeon will explain to you which operation you require and the reason for it.

What are the risks of thyroid surgery?

Other than the risks that apply to all surgery including general anaesthesia

risk, risk of bleeding and infection, the risks specific to thyroidectomy are:

- **Hoarseness** – due to injury of one recurrent laryngeal nerve, which supplies the muscles controlling the vocal cord. Injury is rare and usually temporary, but may be permanent.
- **Difficulty breathing** – due to injury of both recurrent laryngeal nerves. Injury is very rare and usually temporary, but may be permanent. May require a tracheostomy to secure airway.
- **Low calcium** – due to disturbance of the parathyroid glands that control calcium levels in the body. Usually temporary, rarely permanent.

What is scarless or minimal access thyroid surgery?

In suitable patients, thyroid surgery can be performed without using a neck incision. The surgery may be endoscopic or robot-assisted. Skin incisions are located in the axilla or armpit and are less visible than a neck scar and easily hidden by clothing. 🍷

Specialist services available at the following institutions:

- Singapore General Hospital Tel: 6321 4377
- KK Women's and Children's Hospital Tel: 6294 4050 (Services for women and children)

Voice Disorders

Voice disorders are medical conditions that affect the function of the vocal folds (vocal cords) and voice production.

Common causes of voice disorders include:

1. Acute and chronic laryngitis
2. Growths such as nodules, polyps, cysts or tumours
3. Vocal fold paralysis
4. Muscle tension imbalance

1. Acute and Chronic Laryngitis

Laryngitis refers to inflammation of the vocal folds. This can be acute (less than 3 weeks) or chronic (more than 3 weeks).

Causes

Acute laryngitis:

- Viral infection of the upper airway (usually viruses that cause a cold)
- Vocal strain e.g. due to yelling and overuse of voice

Chronic laryngitis:

- Smoking or other inhaled irritants such as chemical fumes and allergens
- Reflux of acid from the stomach into the larynx (laryngopharyngeal reflux)
- Inflammation or infection of the sinuses

- Occupational voice abuse (people who use their voices a lot in their work)

Less common causes of laryngitis:

- Bacterial or fungal infection

Risk factors

- Respiratory tract infections, such as colds, sinusitis and bronchitis
- Exposure to irritants such as cigarette smoke, stomach acid, or chemical fumes
- Overusing the voice

Symptoms

- Hoarse voice
- Dry, tickly throat
- Frequent throat clearing
- Dry cough
- Sore throat

Diagnosis

Laryngitis is diagnosed by a combination of history and physical examination. Your specialist may pass a nasoendoscope (a thin scope with a camera at the end of it) through the nose down to the voice box under local anaesthesia.

Common findings include redness and swelling of the vocal folds.

Treatment

Treatment of laryngitis depends on the underlying cause. Avoiding exposure to irritants such as cigarette smoke, resting the voice and treating underlying causes such as a cold, sinusitis or acid reflux will be enough in most cases.

Medication may be prescribed to treat acid reflux. Occasionally, steroids may be prescribed to reduce swelling in the larynx if urgent voice restoration is required. Antibiotics are usually not needed as laryngitis is not usually caused by bacterial infection.



- Avoid cigarette smoke and chemical fumes.

2. Vocal Nodules, Polyps, Cysts and Tumours

The most common vocal fold growths are nodules, polyps and cysts.

- Vocal fold nodules – thickened areas that occur on both vocal folds. Also known as singer’s nodules or ‘calluses of the vocal fold’.
- Vocal fold polyp – a growth that is typically present on only one vocal fold.
- Vocal fold cyst – fluid-containing sac located under the surface of the vocal fold.

Causes

- Nodules and polyps are usually due to repetitive trauma to the vocal folds e.g. due to frequent yelling or voice overuse.
- Reflux of acid from the stomach into the larynx (laryngopharyngeal reflux) and chronic exposure to irritants such as cigarette smoke may also contribute to formation of nodules and polyps.
- Cysts may occur on their own due to blockage of a mucous gland under the surface of the vocal fold.
- Tumours of the vocal folds can also cause voice problems. Tumours are most commonly caused by smoking and alcohol.

Symptoms

- Hoarse voice
- Low pitch

- Vocal fatigue
- Airy or breathy voice
- Inability to sing high-pitched notes
- Increased effort to speak or sing
- Frequent throat clearing

Diagnosis

Diagnosis is made by taking a history of the voice problem and by physical examination. Your specialist may pass a nasoendoscope through the nose down to the voice box under local anaesthesia.

A more detailed examination is sometimes needed using videostroboscopy. In this procedure, a rigid telescope tube with a stroboscopic light is passed through the mouth (after spraying the throat with anaesthetic) to view the voice box.

Other medical conditions that can contribute to the voice problem such as acid reflux, allergic rhinitis (sensitive nose) and sinusitis may need to be evaluated separately.

Treatment

Treatment includes voice rest, management of aggravating factors (e.g. acid reflux and allergic rhinitis), and sometimes voice therapy with a speech therapist. Many benign vocal fold growths resolve with conservative management.

If the growth persists or there is doubt about its nature, then phono-microsurgery may be advocated. Phono-microsurgery is surgery to the vocal fold using microsurgical techniques and instruments, and sometimes lasers. This surgery may be recommended to improve the voice or remove a growth for laboratory analysis. If a lesion proves to be cancerous, further treatment will be required.

3. Vocal Fold Paralysis

Vocal fold paralysis is less common than the first two groups of disorders. It usually involves paralysis of one vocal fold, and results in inability to close the vocal folds completely. If the vocal folds do not close completely, the voice is weak and hoarse and there may be choking on swallowing due to food or liquids going into the windpipe.

Causes

- Tumours pressing on the nerve that controls vocal fold movement (e.g. cancers of the thyroid, lung, oesophagus and nasopharynx)
- Injury of the nerve that controls vocal fold movement (e.g. during thyroid and chest surgeries; following radiation therapy to the neck; or neck injury)
- Neurologic conditions such as a stroke

Symptoms

- Hoarse voice
- Weak, breathy voice
- Loss of pitch control
- Choking or coughing especially on drinking liquids

Diagnosis

As with other voice disorders, examination of the vocal folds with nasoendoscopy or videostroboscopy may be required (*see page 38*).

Other investigations may include CT or MRI scanning to look for the cause of the paralysis. The specialist may also discuss transnasal oesophagoscopy to examine the food passage (this can be carried out in the clinic); and laryngeal electromyography, which uses a fine needle to measure function of the vocal fold muscle.

Treatment

Sometimes recovery occurs by itself and no action is needed. Depending on the cause of paralysis, this may take up to a year. While waiting for the nerve to recover, speech therapy or an injection to bulk up the paralysed vocal fold may be helpful.

Sometimes an operation (medialisation thyroplasty) is needed to permanently shift the paralysed vocal fold to improve the voice. This operation can

be carried out under local anaesthetic and the specialist will discuss the options with you.

Rarely, if the paralysis involves both vocal folds, there can be difficulty breathing or noisy breathing due to narrowing of the airway. In this situation, a surgical procedure called a tracheostomy may be needed. This involves placing a breathing tube (known as a tracheostomy tube) through an opening in the windpipe. Sometimes a laser procedure to widen the airway may be used instead.

4. Muscle Tension Dysphonia

Muscle tension dysphonia refers to hoarseness and difficulty in using the voice due to excessive tightness or imbalance of the muscles in and around the voice box. It can be due to habitual misuse of the voice muscles or can result from voice muscles trying to compensate for an underlying inflammatory or neurological condition, or growth on the vocal fold.

Causes

- Direct problem with voicing technique and voice muscle misuse
- Acid reflux from the stomach
- Underlying inflammatory or neurological condition, or growth on the vocal fold

Symptoms

- Hoarseness
- Strained voice
- Pain or sore throat when talking
- Voice fatigues easily
- Difficulty controlling pitch

Diagnosis

As with other voice disorders, examination of the vocal folds with nasoendoscopy or videostroboscopy may be required (*see page 38*). This may be carried out in the specialist voice clinic together with a speech therapist. Evaluation of underlying conditions such as acid reflux may also be recommended.

Treatment

Typically treatment is multi-faceted, and involves correcting all underlying causes. Speech therapy may be necessary to improve voicing techniques and overcome bad vocal habits which put unnecessary strain on the voice. Often lifestyle changes are necessary including dietary changes and stress reduction.

Avoiding unnecessary voice use can sometimes allow the voice muscles to relax and rest. Medication to treat acid reflux may also be prescribed.

Spasmodic dysphonia is a specific condition that can produce similar symptoms to muscle tension dysphonia, in particular strained voice. Careful diagnosis is required to distinguish these conditions as botulinum toxin injection may be helpful in spasmodic dysphonia.

Good habits for heavy voice users:

- Hydrate regularly
- Warm up your voice before doing a lot of talking
- Use a microphone when talking to large groups of people
- Avoid lozenges (they sometimes have a drying effect on the throat)
- Rest your voice when you don't need to use it. 🍷



■ Diagnosis requires a view of the vocal cords.

Specialist services available at the following institutions:

- Singapore General Hospital Tel: 6321 4377
- KK Women's and Children's Hospital Tel: 6294 4050 (Services for women and children)

Snoring and Obstructive Sleep Apnoea (OSA)

Sleep-disordered breathing (SDB) is used to describe snoring and obstructive sleep apnoea (OSA) syndrome. Snoring and OSA are common medical conditions that affect between 15-50% of the adult population worldwide.

Snoring, due to vibration of tissues in the throat, can be a symptom of partial upper airway obstruction. The partial obstruction can lead to complete airway obstruction – a medical condition called obstructive sleep apnoea (OSA). In Singapore, about 15% of adults have OSA.

Medical and socioeconomic consequences

Studies have shown that OSA presents a huge economic burden to society. Individuals with untreated OSA use more healthcare resources, are associated with poor work performances and occupational injuries and are involved in more traffic accidents.

Studies have also shown that compared to normal individuals, untreated and inadequately treated OSA can lead to increased risk of:

- High blood pressure
- Heart attack
- Cardiac arrhythmias
- Sudden death

- Premature death in the long run
- Stroke

Causes

Individuals with OSA have a narrower upper airway and repeated upper airway obstruction during sleep, leading to poor sleep quality, sleep deprivation and cardiovascular abnormalities that put tremendous stress on the heart and body.

The upper airway obstruction leads to decreased oxygen supply to the brain, heart and other organs, causing the heart to work harder to provide oxygen to the tissues, leading to medical consequences in the long run.

Symptoms

Someone with OSA can present with:

- Snoring
- Excessive daytime sleepiness
- Choking or gasping episodes during sleep
- Feeling unrefreshed, even after supposed 'enough hours' of sleep

Other symptoms include falling asleep while driving, depression, irritation, decreased libido and morning headaches.

Risk Factors

Anatomic abnormality. Snoring and OSA occur because of anatomic

abnormality in the upper airway leading to obstruction.

The sites involved include the:

- Nose (enlarged turbinates, deviated nasal septum, and nasal polyps)
- Oropharynx (long, redundant and thick palate and uvula, large tonsils)
- Hypopharynx/base of tongue (lingual tonsillar hypertrophy, floppy epiglottis, and bulky tongue) and throat

Genetics. Genetic predisposition leading to facial and jaw abnormalities are known predisposing risk factors.

Medications / Alcohol. Mild or intermittent snoring may be a result of medications (like sedatives to help you sleep) or alcohol that induce relaxation of the upper airway muscles.

Weight. Weight gain can contribute to snoring and OSA. Excessive fat accumulation in the upper airway can amplify an existing anatomic narrowing that was causing mild obstruction previously.

Gender and Age. The male gender and increased age are risk factors.



- Excessive daytime sleepiness is a symptom of OSA.

Diagnosis

Individuals who snore persistently (night after night) should be referred to an Otolaryngologist, who will perform a comprehensive clinical evaluation including an endoscopic upper airway evaluation to determine an appropriate treatment plan.

This evaluation includes a sleep study/ polysomnogram as the patient's own history of apnoea or sleepiness may be inaccurate, and patients with OSA almost always snore.

Treatment

Treatment of both snoring and OSA requires a multidisciplinary and logical approach.

1. Treatment for Snoring

Conservative treatment

This includes eliminating outside factors that may be playing a role.

These include:

- Weight loss
- Avoidance of alcohol or other medications
- Treatment of nasal congestion with medications

In patients with significant snoring, these efforts are rarely successful. An evaluation by an Otolaryngologist is needed to rule out sleep apnoea.

Surgical treatment

If a person wants treatment, several options exist that are directed at the soft palate, nasal and base of tongue.

Most treatments are directed at the soft palate (soft tissue at the back of the roof of the mouth) since this is the most common site of snoring.

Surgery of the soft palate is effective in 80-90% of cases and can be associated with postoperative pain for 7 to 10 days.

In the nose, normal structures called turbinates may be enlarged from allergic rhinitis causing airflow blockage. Reduction of the turbinates using radiofrequency or surgical

reduction (turbinectomy) may be performed. The septum that divides the nose into two sides may also be crooked and needs to be straightened.

The base of tongue and lingual tonsils

(lymphatic tissues at the back of the tongue) may be enlarged and impede airflow during sleep. Obstruction at these sites can be treated by a variety of methods depending on severity.

2. Treatment for Obstructive Sleep Apnoea (OSA)

Indications for treatment of OSA include excessive daytime sleepiness with altered daytime performance, moderate to severe OSA, decreased blood oxygen saturation level, and cardiovascular complications (hypertension, ischaemic heart disease, cardiac arrhythmias and stroke).

Treatment of OSA can prevent cardiovascular complications and improve daytime sleepiness, decrease OSA-related road traffic accidents and work-place accidents and improve quality of life.

Current treatment options include conservative and surgical methods.

Conservative treatment

This includes eliminating outside factors that may be playing a role.

Other factors to consider include:

- Weight loss
- Avoiding alcohol or other medications
- Treatment of nasal congestion with medications

You will be advised to sleep on the side rather than on your back. In someone with significant snoring, these efforts are rarely successful.



- A conservative way of treating OSA – sleep on your side.

Continuous positive airway pressure (CPAP) is the first treatment option. It is applied via a nasal or face mask and works by providing an ‘air stent’ to keep the airway open during sleep. It is effective so long as it is used as directed and has been shown to decrease the medical consequences of OSA. Long-term compliance may be a problem.

Dental splints may be suitable for some and have to be worn every night. Cost concerns as well as dental and temporomandibular joint side effects may prevent compliance.

Surgical treatment

Surgery is recommended if someone is unable or unwilling to use the CPAP device and conservative methods are unsuccessful.

Pre-surgical assessment

Pre-surgical assessment should include:

- Polysomnography
- A detailed history with head and neck physical examination
- Fiber-optic endonasopharyngoscopy
- Appropriate imaging study and sleep endoscopy

They will enable the surgeon to have enough information to help in individualising surgical treatment depending on the severity and sites of obstruction. The surgeon will not rely on a single test or procedure to decide on the treatment.

Successful surgical therapy for treating OSA is based on identifying the levels of airway obstruction, usually in multiple sites, which may include regions of the nose, soft palate and tongue base.

No single surgical procedure can guarantee success.

Surgical procedures serve to remove or reposition tissues that partially or completely block the upper airway during sleep.

These procedures have been used for years and clinical outcomes have verified their use.

Types of Surgeries

Nasal surgery

Nasal airway obstruction caused by bony, cartilaginous or enlarged tissues can interfere with nasal breathing during sleep. An open nasal airway establishes normal breathing and minimises mouth breathing. Mouth breathing in OSA individuals worsens the posterior airway by allowing the tongue to fall back.

Establishing an open nasal airway passage can improve CPAP tolerance and compliance. Techniques include straightening the septum, turbinectomy and nasal valve reconstruction.

Palatal surgery

Abnormal structures at the palate level include large tonsils, redundant lateral pharyngeal mucosal, thick and long soft palate and hypertrophied posterior tonsillar pillar muscles and mucosal. All these contribute to a narrow airway at the palatal level.

The traditional Uvulopalatopharyngoplasty (UPPP) and many variations of it can be used. Most surgeons have shied away from the traditional UPPP in favour of modified techniques and surgical flaps (like uvulopalatal flap, extended uvulopalatal flap, lateral pharyngoplasty) as these have fewer complications, are less ablative and have a higher success rate.

In carefully selected patients, the success rate may be 50-60% but falls to a low of 5-30% in unselected patients. This is because of the failure to address tongue base and hypopharyngeal obstruction.

Hypopharyngeal and base of tongue surgery

Compared to the nasal and oropharyngeal level, obstruction at the hypopharyngeal (base of tongue) level is a very complex issue as the large tongue base tissue collapses easily during sleep.

Obstruction at this level may be bypassed via a tracheotomy or by either increasing airway size to make more room for the tongue or reducing the tongue size. Both soft tissue techniques and skeletal work may be required.

Soft tissue work involves removing the midportion of the tongue (median glossectomy, lingualplasty or volumetric reduction by radiofrequency).

Skeletal advancements techniques can increase the airway size and tension on the tongue so that even if the tongue falls back during sleep it does not obstruct the airway. This procedure includes inferior sagittal mandibular osteotomy and genioglossus advancement and hyoid procedures

Maxillomandibular advancement surgery

Maxillomandibular advancement surgery is a more aggressive procedure, usually saved for when the more conservative surgery fails. It involves the forward movement of the lower jaw and midface and gives the tongue more room, opens the airway more and places additional tension on the tongue base. The individualised use of staged soft tissue and skeletal procedures for upper airway reconstruction ensures that the most conservative treatment is offered and the possibility of unnecessary surgery reduced.

Tracheostomy

Tracheostomy involves creating a hole in the trachea, directly bypassing the upper airway obstruction. It is used in people with refractory base of tongue obstruction and in the morbidly obese with medical conditions that contraindicate surgeries that are more extensive. Though the success rate is 100%, this option is usually not accepted by patients and with the introduction of CPAP, it is seldom used to treat OSA. 🍷

Specialist services available at the following institutions:

- Singapore General Hospital Tel: 6231 4377
- KK Women's and Children's Hospital Tel: 6294 4050 (Services for children only)

Head and Neck Cancer

Cancers occurring in the head and neck region are usually categorised together. They form a diverse group and include cancers of the skin over this region, cancers in the sinuses, nose, mouth, throat, thyroid and salivary glands. Cancers of the brain and eye are usually not classified within the same group.

Symptoms

This depends on the location of the cancer.

Common to all locations

- Neck lump – may be the tumour itself or a lymph node enlarged by tumour cells
- Significant loss of appetite and loss of weight

Mouth

- Non-healing ulcer
- Tumour or growth

Throat (larynx, oropharynx and hypopharynx)

- Hoarseness
- Persistent sore throat
- Difficulty or pain on swallowing

Nose (nasal cavity, sinuses and nasopharynx)

- Blood-stained mucus or nose bleed
- Nasal blockage
- Blocked ear

Skin

- New skin nodule especially if growing
- New mole especially if growing or irregular pigmentation
- Non-healing ulcer

Risk Factors

Risk factors for head and neck cancer include:

- Smoking
- Drinking alcohol
- Tobacco or betel nut chewing
- Excessive sun exposure for skin cancer
- Family history of nasopharyngeal cancer (NPC)

The total increase in risk with smoking and alcohol together is higher than the sum of their individual risks.



■ Get in the shade – too much sun can cause skin cancer.

Prevention

Head and neck cancer and its treatment can lead to significant problems functionally and cosmetically even if cured. Prevention is certainly better than cure in this situation and the greatest risk reduction can be achieved by not smoking and not consuming alcohol.



- Reduce your risk. Don't smoke and use alcohol.

Diagnosis

When you have any of the above symptoms, your primary care doctor will refer you to an Otolaryngologist or Head & Neck Surgeon. Your surgeon will first perform a complete head and neck examination, which will usually include examination of the mouth, flexible fibreoptic endoscopy of the nose, pharynx and larynx and examination of the neck.

Depending on the suspected location and type of tumour, the following investigations may be ordered.

To determine the type of cancer

- Biopsy – removing a small piece of tumour for testing if it can be easily reached
- Fine needle aspiration cytology (FNAC) – using a needle to extract cells for testing, from lymph node or if tumour is deep

To evaluate extent or stage of cancer

- CT or MRI scan of the head and neck region
- CT of lungs and liver
- Bone scan
- PET scan

Miscellaneous tests

- EBV serology – blood test for risk of nasopharyngeal cancer

A diagnostic operation, panendoscopy, may be necessary on top of the above investigations, to accurately determine the extent of the tumour and examine the rest of the areas at risk for a second cancer, which may exist in up to 10% of patients.

This operation involves examining the entire pharynx and larynx (throat), trachea (windpipe) and oesophagus (food passage) with the aid of rigid scopes under general anaesthesia.



- A complete head and neck exam is necessary for diagnosis.

Treatment

After completion of staging, in some hospitals, patients may be discussed in a multidisciplinary tumour board, comprising surgeons, medical oncologists, radiation oncologists, pathologists, radiologists and nuclear medicine physicians. All treatment options will be presented to patients, together with recommendations.

Stage 1 and 2 cancers are considered early-stage disease and a single modality of treatment is usually sufficient. This may be surgery or

radiotherapy. Chemotherapy alone is not the treatment of choice for head and neck cancers.

Stage 3 and 4 cancers are considered advanced-stage disease and require multiple modality treatment.

This involves various combinations of surgery, radiation and chemotherapy:

- Surgery followed by radiation
- Surgery followed by chemotherapy and radiation
- Chemotherapy and radiation alone ✓

Specialist services available at the following institutions:

- Singapore General Hospital Tel: 6321 4377
- KK Women's and Children's Hospital Tel: 6294 4050 (Services for children only)
- National Cancer Centre Singapore Tel: 6436 8088

Common ENT Conditions Among Children

1. Nosebleeds in Children

Nosebleeds can be scary, but usually cause no harm to children.

Children usually bleed from the superficial and thin blood vessels at the front portion of the nose on the septum, just behind the nostrils. Such nosebleeds usually decrease after puberty as the nose lining thickens from hormonal changes.

Causes

The most common causes of nosebleeds are:

- Nose-picking – this may also increase the frequency of nosebleeds
- Allergies
- Colds
- Injuries
- Irritation from dry or cold air

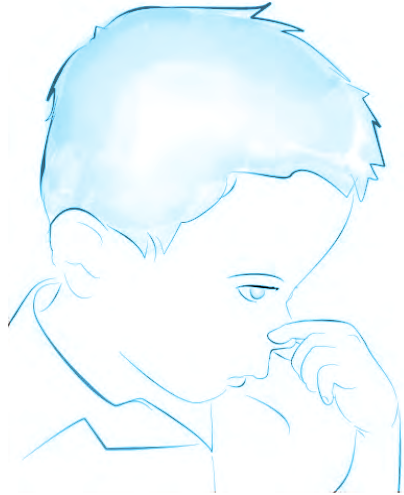
In rare instances, bleeding disorders or nasal tumours may cause nosebleeds.

Treatment

Self-care measures

With the right self-care, most nosebleeds will stop on their own.

When a child's nose bleeds, ask him to sit up, lean forward and pinch the lower soft portion of the nostrils together



■ How to stop a nosebleed.

for 5 to 10 minutes, and breathe through the mouth.

An ice pack can be placed across the nose-bridge and forehead or the cheek to allow for reflex constriction of the tiny blood vessels. The majority of nose bleeding stops during this time. If bleeding starts again, compression can be applied for another 10 minutes.

Sitting upright keeps the nose higher than the heart, and reduces the flow of blood to the bleeding site. Leaning forward prevents your child from swallowing blood that could result in vomiting and other uncomfortable symptoms.

When to seek emergency medical care

You should seek emergency medical care if your child's nosebleed:

- Involves massive bleeding or makes breathing difficult
- Causes your child to become pale, fatigued and disorientated
- Will not stop even with the self-care measures outlined above
- Occurs after an injury, such as after being hit on the face or nose
- Will not stop and your child has other areas of bleeding or multiple bruising over his body

When to seek ENT specialist treatment

If your child's nose bleeds only once in a few months it is not likely to be of serious concern. However, if it is a regular occurrence i.e. 4 to 5 times a month, your child should be reviewed by a specialist to rule out rarer causes of nosebleeds.

The ENT surgeon can check the nose for growths or abnormal blood vessel formations. Another explanation for one-sided nosebleeds or odorous nasal discharge in a child is the presence of a foreign body. When examining children with frequent unexplained nosebleeds, ENT surgeons often discover beads, rubber erasers or toys lodged deep in the nose.



- Nosebleeds usually cause no harm to children.

Other measures

A humidifier can be used to reduce the drying caused by air-conditioning as it may not be practical to avoid sleeping in an air-conditioned room in Singapore's warm equatorial climate.

Advise your child against frequent nose-picking to prevent trauma to the affected area.

If all these measures fail, consult an ENT surgeon who may **cauterise** (seal off) the affected area with diathermy (a procedure using an electric current, usually done under general anaesthesia).

If the child refrains from nose-picking and other predisposing factors are removed, this procedure usually allows for 6 months to a year of relief from symptoms.

2. Snoring in Children

Snoring is caused by vibration or flapping of the tissues lining the upper passages. Many, if not most, children snore on occasion, and about 10% snore on most nights.

Loud and regular nightly snoring is often abnormal in an otherwise healthy child. About 1-3% of children not only snore, but also suffer from breathing problems during their sleep.

Primary snoring is snoring that is not associated with other more serious conditions such as obstructive sleep apnoea (OSA), in which breathing is interrupted during sleep. OSA is characterised by episodes of complete or partial upper airway obstruction during sleep, resulting in gas exchange abnormalities and arousals, causing disrupted sleep.

Untreated OSA is associated with cardiovascular complications, impaired growth, and learning and behavioural problems. Early diagnosis and treatment may decrease such complications.

Causes

Snoring in most people is due to multiple factors, such as:



- Most children can be treated for snoring.
 - Large tonsils and adenoids
 - Relaxation of muscles, causing the walls of the upper airway to fall together and vibrate
 - Swelling of the tissue in the walls (e.g. from anatomical reasons, infection or injury), causing narrowing of the airway
 - Nasal blockage due to colds, nasal allergy or deformities of the nasal

septum (the cartilage partition between the two sides of the nose)

Large tonsils and adenoids are the most common cause of snoring and sleep apnoea in infants and children.

Another factor which can influence snoring is obesity.

Diagnosis

If your child has loud, regular snoring, you are advised to consult your physician, who may then refer your child to a Sleep Disorders Centre for a thorough evaluation.

Treatment

Effective treatment is available for almost all patients. The treatment of snoring is often a combination of medical and surgical options. The choice of therapy will depend on the underlying cause and the extent of the problem.

Medical

As nasal obstruction increases the frequency of snoring and sleep disordered breathing, your doctor may prescribe nasal sprays or oral medications to help your child breathe better through his nose during sleep.

For those diagnosed with sleep apnoea, Nasal CPAP (Continuous Positive Airway Pressure) is used to

supply pressurised air into the upper airway via a nasal mask. This keeps the upper airway open.

Surgical

Surgical procedures for the treatment of snoring may include surgery of the nose, palate, jaw, tongue and/or neck, depending on the location of the tissues contributing to the snoring.

Certain nasal conditions such as deviated nasal septum and very large tonsils and adenoids may require assessment by the ENT surgeon.

Surgery to remove the tonsils and adenoids is the mainstay of surgical treatment for OSA in children.

Another procedure, radiofrequency thermal ablation of the inferior turbinates (structures in the nasal cavity that may cause nasal obstruction), stiffens and shrinks this nasal tissue and may additionally be used to treat snoring in certain children.

Useful suggestions

- Obesity adds to the risk of snoring and apnoea. If your child is obese, his weight must be managed along with his treatment.
- Sleep on the side and avoid sleeping on the back. Some snore, or snore heavily, only when sleeping on the back.

3. Tonsils and Adenoids

Tonsils and adenoids are part of a 'ring' of glandular/lymphoid tissue encircling the back of the throat. Tonsils are visible at the back of the mouth, one on each side. The adenoids are found high in the throat, behind the nose and need special instruments or an X-ray to view it.

Tonsils and adenoids act as 'policemen' and help to form antibodies to 'germs' that invade the nose, mouth and throat. This function may be important for young children up to 3 years of age, but there is no evidence that it is important after that. Studies have shown that children who have had their tonsils/adenoids removed suffer no loss in their immunity to diseases.



- Children with the tonsils removed after the age of 3 suffer no loss of immunity to disease.

Conditions affecting the tonsils and adenoids

Several conditions may affect the tonsils and adenoids in a child:

- Enlarged tonsils and adenoids contributing to snoring or obstructive sleep apnoea (OSA)
- Recurrent tonsil or adenoid infections
- Rarely, tumours or growths in the tonsils or adenoids

Treatment

Medical

Antibiotics may be prescribed to treat recurrent tonsil and adenoid infections or otitis media with effusion (middle ear infections). If treated successfully, surgery may be avoided.

For children who snore or face breathing difficulties due to enlarged adenoids/tonsils, CPAP (Continuous Positive Airway Pressure) may be considered to keep the upper airway open.

Surgical

Surgical removal of tonsils or adenoids is done under general anaesthesia and requires admission to the hospital. Generally, about a 48-hour hospital

stay is required. Shortly after admission, blood tests may be carried out as appropriate. The child will be required to fast overnight i.e. no food or drink after 12 midnight before the operation.

For a younger child, a shorter period of fasting might be sufficient, depending on the anaesthetist's assessment. The operation is done through the oral cavity. No incision will be made on the face or neck.

If your child has a fever or cough just before the surgery, you must inform your doctor about it. The surgery may need to be postponed if your child is found unfit for surgery.

If the child has any history, or family history of bleeding disorders, or any previous problems with anaesthesia, it must be brought to the doctor's attention.

Soon after the surgery, your child might still be sleepy, and may vomit from the effects of general anaesthesia. This will wear off over a little time. After a few hours, your child will be allowed to drink water and eat ice cream.

Encourage sips of a cool, clear liquid when the child is fully conscious. A soft diet is usually given the next morning. Slightly blood-stained sputum may be produced, but this is expected.

Care after the surgery

Your child will have a sore throat and dryness of the mouth but this will improve. Eating and drinking should resume and be encouraged as this will prevent debris from collecting, and help in recovery. The 'pain killer' given should be taken to relieve throat discomfort and the entire course of antibiotics to be completed.

The tonsillar beds at the back of the throat will have a whitish coating in the ensuing days of recovery. This is the normal appearance of a recovering wound in the mouth.

After the surgery, the child should avoid:

- Acidic/citrus fruit juices such as orange or lime juice to prevent irritation of the throat
- Use of hard objects in the mouth
- Frequent coughing or clearing of the throat, as this may aggravate bleeding from the operative site
- Physical exercise for a period of 2 weeks
- Overcrowded places and smokers
- Contact with people suffering from cough, colds and other infections

These precautions are advised to prevent a very small risk of bleeding from the tonsillar beds.

After discharge

Oral hygiene should resume. Keeping your child on a soft diet for 2 to 3 days will help the wound to heal. Your child can revert to a normal diet after that.

The child should stay at home for a week after the operation and may return to school after that. During this first week, encourage small sips of plain water frequently to keep the throat moist and clean.

Children aged 12 and above should be encouraged to gargle their mouth after each meal to keep the throat clean.

Consult your doctor when:

- Fever is higher than 38°C
- There is large amount of bleeding from the throat:
 - Excessive swallowing reflex
 - Vomitus
- There is severe pain of the throat or ear not relieved by medication
- Any prolonged/abnormal symptom(s) which may cause concern.

Follow-up appointment

Usually a single post-operative follow-up date is given. Do keep the appointment with the doctor, as the follow-up care is important in preventing complications.

4. Otitis Media with Effusion (OME)

OME, otherwise known as 'Glue Ear', is the collection of fluid in the middle ear. It occurs commonly in children and studies show up to 60% of children have at least one episode by the age of 6.

It frequently occurs after an upper respiratory tract infection and in the majority of cases, it resolves by itself. However, the length of time for this resolution varies and may take up to 3 months.

Causes

OME usually occurs due to the malfunction of the Eustachian Tube – the tube that connects the middle ear to the back of the nose which allows ventilation and proper function of the middle ear mechanism.

Symptoms

Older children often complain of earache and hearing loss. Younger ones may become fussy, sleep poorly, and often pull and tug at their ear.

However, most of the time the children are unaware of the hearing loss. The caregiver may notice that the child turns up the volume of the radio/ TV or is not attentive during normal conversation. Teachers may also



- OME can often be diagnosed on a clinical examination.

complain that the child is inattentive during lessons or is doing poorly in school.

Diagnosis

There are several ways of diagnosing OME. Very often, on clinical examination, the eardrums are found to be dull and sometimes bubbles of air may be seen behind them. A hearing test typically shows a mild to moderate conductive hearing loss.

Treatment

When symptoms of hearing loss persist, particularly at a time when a child is learning to speak, medical evaluation and treatment are recommended.

Hearing loss is the single most important cause of a child having delayed speech.

Options

To improve Eustachian tube function, a variety of medication may be used. Antibiotics, decongestants and nasal sprays (if nasal allergy co-exists) are the more common ones.

If this fails, surgical options will then be explored. For

children, the operations performed are Myringotomy and Tube insertion (M&T) with or without adenoidectomy.

Surgery

M&T is done under general anaesthesia as a day surgery. This simple procedure generally takes about 15 minutes and involves making a cut on the eardrum and placing a tiny ventilation tube through it. This then allows ventilation of the middle ear.

Possible admission to the hospital is required only when adenoidectomy is done as well. The child will be required to fast overnight i.e. no food or drink after 12 midnight before the operation.

For a younger child, a shorter period of fasting may be sufficient, depending on the anaesthetist's assessment.

If your child has a fever or cough just before the surgery, you must inform your doctor about it. The surgery may need to be postponed if your child is found unfit for surgery. If the child has any history, or family history of bleeding disorders, or any previous problems with anaesthesia, it must be brought to the doctor's attention.

Soon after the surgery, your child might still be sleepy, and may vomit from the effects of general anaesthesia. Your child will be allowed to drink water a few hours later, and eating is resumed depending on the child's recovery.

An immediate improvement in hearing should follow after the surgery.

After discharge there is no dietary restriction, and normal diet and oral hygiene may be resumed. The ventilation tubes placed through the eardrum will be expelled automatically in 6 months' to a year's time. Although expelled from the eardrum, the tube may remain in the ear canal, and may need removal by the doctor during a follow-up visit.

5. Earwax in Children

Cerumen or earwax is a naturally occurring substance in our ears. Special glands found in the outer half of the skin lining the ear canal produce this yellowish brown, thick, or viscous substance. Genes determine the colour of the wax.

Primarily, earwax traps dust and other dirt particles to prevent them from reaching the eardrum. Eventually, the dust and dirt laden earwax will be transported slowly by the migration of the upper layer of the ear skin towards the outer opening of the canal. As the 'older' wax reaches the opening of the canal, it dries out and falls away.

What are the functions of earwax?

Aside from trapping dust and dirt, earwax also provides protection to the ear by preventing infection and inflammation. Because of the acidic nature of the wax and powerful enzyme (lysozyme) it contains, it inhibits the growth of bacteria and fungus in the ear.

Due to its oily nature, earwax also provides a waterproof layer for the canal skin, preventing water accumulation, penetration and skin maceration.

Does earwax cause problems?

Under normal conditions, earwax is not supposed to cause any ear problems. However, there are some instances where wax will be troublesome. The most common condition is called wax impaction.

This normally occurs from attempts to remove wax using cotton buds or other implements. These objects cause the wax to be pushed into the deeper part of the ear or cause the wax to become tightly packed, preventing normal migration towards the outer part of the ear.

Other conditions that might predispose the child to earwax-related problems are:

- Wearing of hearing aids
- Over-production of wax
- Abnormal shape of ear canal (e.g. narrow ear canals)

Symptoms

The most common symptom associated with impacted earwax is mild hearing loss or ear fullness. This usually happens if the canal is completely blocked by earwax, otherwise hearing is maintained.

Impacted earwax is usually painless unless it touches the eardrum. An attempt to remove hard wax can cause abrasion and pain to the delicate ear

canal skin. Water trapped inside the ear during a shower or after swimming will cause the wax to expand and can cause ear pain and sudden hearing loss.



- Earwax does not cause any ear problems under normal conditions.

Other symptoms associated with impacted wax in the ear include: ear itchiness, ringing in the ear and, on rare occasions, dizziness.

Treatment

Impacted wax needs to be removed if it is causing problems such as ear pain and hearing loss. Removal of earwax is also necessary if it is preventing proper evaluation of the eardrums and middle ear space.

There are several available ways of removing earwax. The most common home remedy is the use of a wax-

softening agent, which is applied everyday until the wax softens and comes out.

Some commercial preparations can cause allergic reaction to ear canal skin and should be used with caution among children with known allergies. Safer alternatives to these commercial drops include mineral oil and glycerin. If wax-softening agents fail, the next option will be to seek professional help.

Earwax removal either by irrigation or suctioning is normally performed in the clinic. Earwax can also be removed manually using special instruments if the child is able to understand instructions and willing to cooperate. Manual removal of wax should not be attempted at home if the wax is located deep in the ear canal.

For children who cannot cooperate with the above methods, removal of earwax and ear examination can be accomplished under sedation or general anaesthesia.

Preventing earwax build-up

Earwax is a natural body secretion and there is no way to stop our body from secreting this substance. One of the ways to prevent impacted earwax is to avoid the use of cotton swabs in the ear canal.

The best way to clean the external ear is to wipe the outer opening with a damp washcloth folded over the index finger, without going into the ear canal.

Since the rate of earwax production varies from one individual to another, it is advisable to check your child's ear at least once a month. If wax is beginning to build up, you can start using any of the available home remedies for softening wax.

Before using any eardrops, make sure that your child's ear has no infection or eardrum perforation. If your child develops ear pain or ear discharge after using eardrops, immediately stop using the drops and seek professional advice. Children wearing hearing aids should also have their ears checked periodically for signs of wax impaction. 🍌

Specialist services available at the following institution:
• KK Women's and Children's Hospital Tel: 6294 4050

Singapore General Hospital



Department of Otolaryngology (ENT)

Since its establishment in 1957, the Department of Otolaryngology has grown in size and stature and expanded on the scope and depth of its services to give patients the best medical care possible.

With the setting up of the SGH ENT Centre, the Department of Otolaryngology now offers a one-stop service with comprehensive and specialised care for a full range of ear, nose, throat, and head and neck conditions.

ENT Clinical Services:

Head & Neck Surgery

We adopt a multidisciplinary approach, collaborating closely with other related specialties to provide comprehensive patient care for the diagnosis and treatment of head and neck tumours.

These include benign and malignant tumours involving the nasopharynx, oral cavity (mouth), oropharynx

(throat), larynx (voice box), hypopharynx (inlet into the gullet), paranasal sinuses, thyroid and salivary glands.

Otology and Neuro-otology (Ear)

Treatment and surgery for acute and chronic ear infections (cholesteatoma, mastoiditis, suppurative otitis media) and evaluation for hearing loss and vertigo. We also provide comprehensive service for cochlear implant and management of tinnitus.

Rhinology and Paranasal Sinuses (Nose)

Diagnosis and surgery for nose and sinus tumours, chronic sinusitis, septoplasty and rhinoplasty. We also provide diagnostic allergy testing for patients with allergic rhinitis.

Laryngology and Speech (Throat, Voice and Swallowing Disorders)

Evaluation and treatment of voice and speech disorders (Voice Clinic), including video laryngoscopy, stroboscopy and speech therapy. Evaluation and treatment of swallowing disorders including video fluoroscopy and functional endoscopic evaluation of swallowing (FEES).

Paediatric Otolaryngology (Children)

Evaluation and surgical treatment of childhood ailments such as chronic

or recurrent tonsillitis, otitis media with effusion, congenital deafness and paediatric airway problems. Tonsillectomy, insertion of ear ventilation tubes, microlaryngo-bronchoscopy (MLB) for evaluation and treatment of airway problems are routinely performed.

Snoring and Sleep Apnoea Surgery

Evaluation and treatment of snoring and obstructive sleep apnoea (OSA). A comprehensive range of therapeutic options as well as outpatient-based radiofrequency reduction of nasal turbinates, soft palate and tongue base are offered.

Listen and Talk Programme (including Cochlear Implant)

The programme provides comprehensive services for adults and children with hearing impairment and include: fitting and services of hearing aids, cochlear implantation, auditory-verbal therapy (AVT), speech and language assessment, and parental education and support groups for hearing-impaired children.

Audiology (Hearing and Vertigo)

The audiological services provide essential support to doctors in the evaluation and management of patients with hearing loss, vertigo and

balancing problems (due to vestibular dysfunction).

Tinnitus Clinic

The clinic provides treatment and counselling for patients with tinnitus and hyperacusis. Our team of otolaryngologists, audiologists, audiologist technicians and tinnitus counsellor work in collaboration to ensure the best possible outcome. Our tinnitus retraining programme is internationally-acclaimed and is recognised by the Tinnitus Retraining Therapy Association (TRTA).

Senior Consultants

Dr Tan Yau Boon, Barrie (Head)
Assoc Prof A Balakrishnan
Dr Chan Yew Meng
Dr Toh Song Tar

Consultants

Dr Han Hong Juan
Dr Teo Ee Hoon Constance
Dr Teo Wei Yang Neville
Dr Thong Jiun Fong
Dr Heah Hon Wei Harold

Associate Consultant

Dr Siti Radhzhiah Binte Sulaiman

**For information and appointments,
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Listing of doctors at SGH current as at March 2017. Please refer to the website www.sgh.com.sg for the latest information.

KK Women's and Children's Hospital



The Children's ENT Centre at KK Women's and Children's Hospital is the only dedicated tertiary referral centre in the region for children's ear, nose and throat (ENT) problems.

Providing comprehensive multi-disciplinary diagnosis and treatment, along with complete cover for elective and emergency surgeries for children, it sees the majority of complicated paediatric ENT problems and head and neck diseases in Singapore.

It is one of only two centres in Singapore performing paediatric cochlear implants. It is also an accredited teaching centre in paediatric otolaryngology for ENT specialist training.

The centre has fully-equipped consultation rooms and treatment rooms for minor surgical procedures, videoendoscopy facilities and a complete audiological set-up for hearing tests.

Range of services:

- Paediatric broncho-oesophagology
- Paediatric rhinology
- Paediatric otology & neuro-otology including bone anchored hearing aid and cochlear implant
- Paediatric head & neck
- Paediatric swallowing assessment
- General paediatric otolaryngology
- Paediatric audiology & auditory verbal therapy
- Audiology services – hearing and communication programme

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Listing of doctors at KKH current as at March 2017. Please refer to the website www.kkh.com.sg for the latest information.

National Cancer Centre Singapore



At National Cancer Centre Singapore (NCCS), we believe in providing the most effective outcome to patients through our multidisciplinary approach, where any treatment there is for cancer is available.

They include Medical Oncology, Oncologic Imaging, Palliative Medicine, Surgical Oncology and Radiation Oncology.

To provide integrated care to patients, these disciplines are grouped into different cancer types. Our oncologists sub-specialising in these cancer types operate from our Specialist Oncology Clinics to give patients the convenience of care at one-stop.

NCCS specialists treating Head and Neck cancers:

Senior Consultants

Dr Ang Mei-Kim
Assoc Prof Lim Wan Teck Darren
Dr Ng Quan Sing
Dr Tan Shao Weng Daniel
Assoc Prof Tan Eng Huat
Dr Teo Tze Hern Patrick
Dr Fan Yoke Fun
Assoc Prof Khoo Boon Kheng, James
Dr Fong Kam Weng (Head, Division of Radiation Oncology)
Dr Wee Tien Seng Joseph (Chairman, Medical Board)
Dr Soong Yoke Lim
Dr Tan Wee Kiat, Terence
Assoc Prof Narayanan Gopalakrishna Iyer
Dr Tan Hiang Khoon
Dr Tan Ngian Chye
Prof Soo Khee Chee (Director, NCCS)

Consultants

Dr Chua Lee Kiang Melvin
Dr Kiattisa Sommat

Associate Consultants

Dr Tan Wan Ling
Dr Nazir Babar

For information and appointments, please contact:

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www.nccs.com.sg

Listing of doctors at NCCS current as at March 2017. Please refer to the website www.nccs.com.sg for the latest information.

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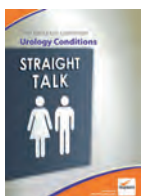
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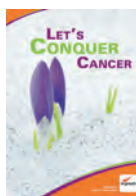
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