

Brush Up

On what you need to know
about common dental conditions



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As an Academic Medical Centre, we seek to transform patient care by integrating clinical services, teaching and research. Patients at SingHealth enjoy the benefit of leading-edge treatments with a focus on quality and holistic care, in an integrated and multidisciplinary setting.



Foreword

Taking care of your oral health begins with you, and educating yourself is the first step towards healthy teeth and a beautiful smile.

Good oral health is an essential part of your overall wellbeing – a beautiful smile communicates confidence, attractiveness and friendliness while healthy teeth are necessary for optimal nourishment and enjoyment of your food.

We at SingHealth have produced this easy-to-read booklet to empower you with information to better understand what condition you may be suffering from. It is important to identify the preliminary signs and symptoms and be aware of the latest treatment options, so that you can make the most appropriate choice for yourself.

CI Assoc Prof Poon Choy Yoke
Director
National Dental Centre Singapore

Dentistry is not limited to the treatment of diseases of the oral cavity but also its related structures and tissues, particularly in the maxillofacial (jaw and facial) area. As a specialty dental centre, we see a variety of these problems from advanced gum disease, misaligned teeth, to more complex problems such as jaw abnormalities, jaw tumours and sleep disorders.

At SingHealth, both National Dental Centre Singapore and KK Women's and Children's Hospital offer a comprehensive suite of oral health services to manage complex dento-facial and rehabilitative needs for both adults and children. Operating in a modern, well-equipped facility, our dedicated teams of multidisciplinary clinical experts and trained support staff strive to provide the highest standard of care and safety for our patients.

SingHealth Healthy Living Series

The SingHealth Healthy Living Series of booklets aims to bring health information to the public. Our booklets cover a range of medical conditions and are written with the aim of empowering you to take charge of your health by helping you to understand your medical conditions and the various treatment options available.

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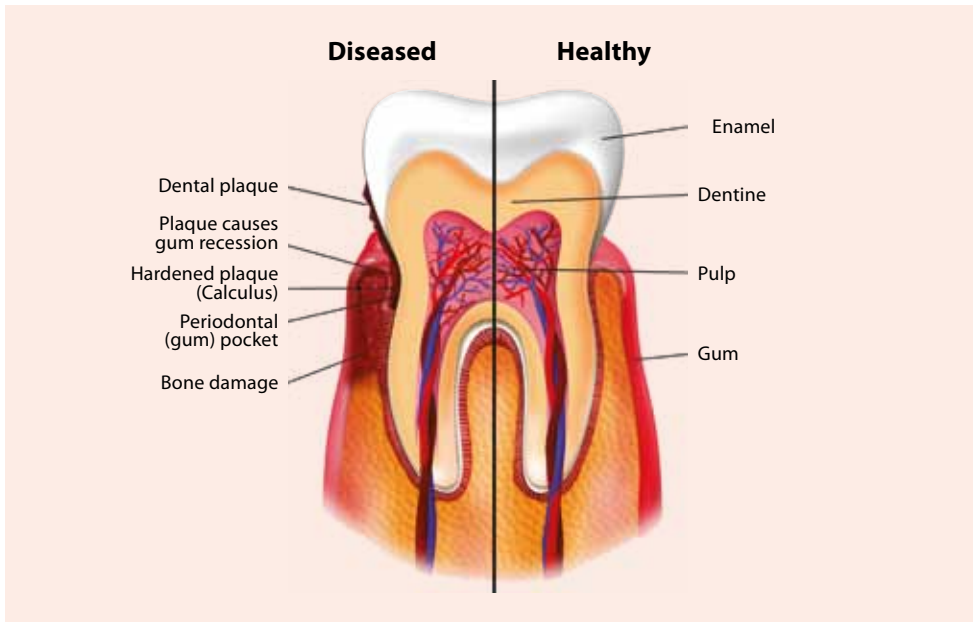
Gum Disease

Gum disease is a chronic bacterial infection of the gums and the bone supporting the teeth. It can affect one tooth or several teeth. If left untreated, it may lead to the loss of tooth or teeth.

The main cause of gum disease is bacterial plaque. It is a sticky film, made up of bacterial and salivary protein, that accumulates on the surface of the teeth. The plaque causes 'gingivitis' which is an inflammation of the gums. The gums become red and

puffy, and bleed easily. Gingivitis is a mild form of gum disease which is reversible.

Left untreated, it can progress to a more advanced stage of gum disease called **periodontitis**. The gums start to separate from the teeth, allowing bacteria to form periodontal (gum) pockets which will destroy the underlying supporting structures (bone and connective tissue). The teeth may eventually become loose and need to be removed. The disease can occur at any age.



You may be more prone to gum disease if you have any of these risk factors:

- **Poorly controlled diabetes.** This means that you are at a higher risk of developing infections, including periodontal disease.
- **A heavy smoker.** Smoking is the most significant risk factor associated with the development of periodontitis.
- **Undergoing hormonal changes** such as puberty or pregnancy in females.
- **Taking certain medications** that may cause your gums to swell or overgrow (certain anti-hypertensive and immuno-suppressant drugs).
- **A lower immunity against infection** due to HIV infection or if you are undergoing cancer treatments.
- **Poor nutrition.**
- **Genetic susceptibility** to periodontal disease.

SIGNS AND SYMPTOMS

- Bleeding gums when brushing or flossing your teeth
- Red, swollen or puffy-looking gums
- Painful or tender gums
- Pus discharge from the gums causing a bad taste in the mouth
- Gum abscesses (gum swelling with pus)
- Shaky teeth
- Teeth appearing to drift apart from its original position
- Receding gumline (gum recession)
- Persistent bad breath
- Vague discomfort or dull ache in gums and teeth

You may still have gum disease and not have any of the above signs and symptoms as most people do not experience any pain with gum infection.

HEALTHY GUMS



SIGNS OF GUM DISEASE



Red, swollen gums



Plaque calculus



Bone loss



Loose, separating teeth

TREATMENT

The type of treatment and number of visits will vary depending on the extent of the disease. Regardless of the treatment, it is important that you maintain good oral hygiene. Smokers are strongly advised to quit smoking to improve treatment outcome.

INITIAL PERIODONTAL TREATMENT

Plaque that is allowed to accumulate on the teeth over time will harden to form calculus (tartar). Calculus being rough will trap more plaque. It can only be removed by professional cleaning by a dentist or dental hygienist.

Removing the bacterial plaque and calculus is necessary to allow the gums to heal.

- **Scaling** - Removing the calculus from above and below the gum line.
- **Polishing** - Removing plaque and stains from the root surface.

- **Root Planing** - Using special instruments to remove tough calculus and bacterial deposits along the root surfaces, usually under local anaesthesia.

As your gums heal, they normally shrink, and you may notice gaps appearing between your teeth. Your teeth may also experience increased sensitivity to cold food or drinks. If this occurs, your dentist can recommend toothpaste or gels/rinses for sensitive teeth.

SURGICAL TREATMENT

Gum Surgery

If deep periodontal (gum) pockets and gum inflammation persist following initial periodontal treatment, this could be due to calculus in difficult-to-reach areas. Your periodontist may then decide to perform surgery to gain access to clean the teeth better and to further reduce the pockets. In certain conditions, your periodontist might use grafting materials to promote regeneration of destroyed bone and gum tissues.

PREVENTION

Plaque forms within hours after it has been removed from your teeth. Effective removal of plaque can help to prevent gum disease. These are some preventive steps:

- **Brush your teeth** at least twice daily. Brushing after every meal is also helpful.
- **Brush half an hour after a meal.** If you have consumed acidic food or drinks, this helps to reduce tooth sensitivity.
- **Floss everyday.**
- **Use an interdental brush** on teeth with a larger gap.
- **Visit the dentist routinely,** twice a year for a check-up and professional cleaning.
- **Do not use tobacco products.**

Remember, your gums and the underlying bone support all your teeth in place and a beautiful smile starts with healthy gums!

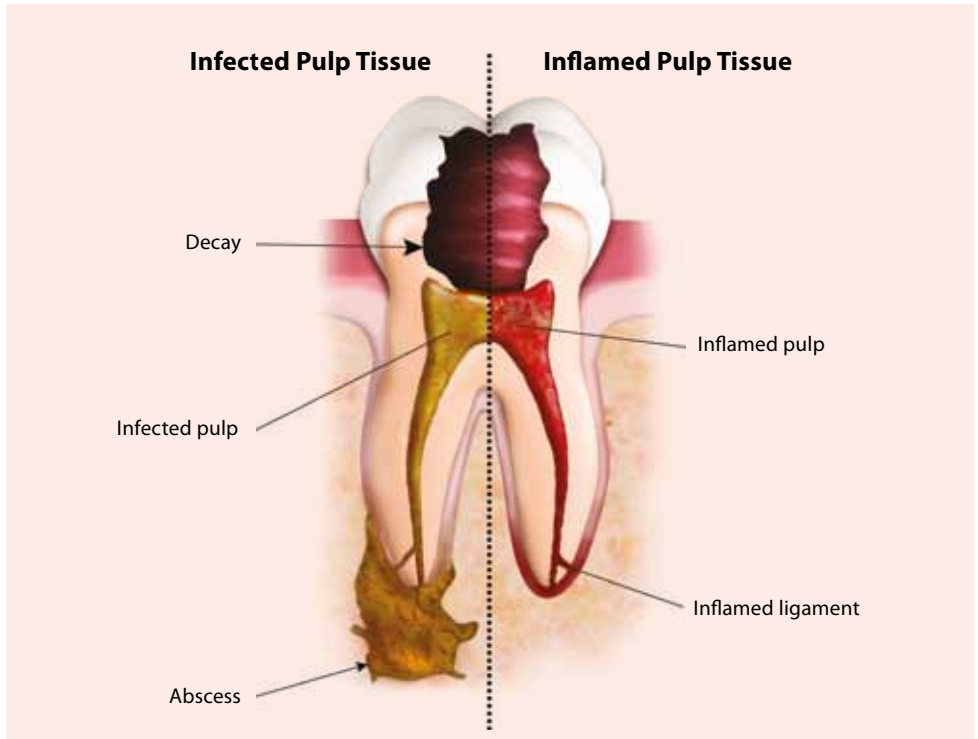


Prevent gum disease – floss and brush regularly.

Dental Pulp Infection

The dental pulp contains connective tissue, blood vessels and nerves. Dental pulp infection is primarily caused by

tooth decay (caries) or it can be secondary to other causes, such as trauma, cracks or excessive tooth wear.



CAUSES

- **Caries or tooth decay** is the most common cause of dental pulp infection.



Early caries:
White spot lesions.



Cavitated caries.



Caries left unattended may
lead to tooth loss.

Other pathways for bacterial invasion into the tooth structure and infection of the underlying dental pulp are through:

- **Defective fillings or restorations**



Defective, overcontoured (poorly-shaped)
crowns.



Recurrent caries found after removing
crowns.

- **Cracks** in the tooth structure as a result of excessive biting of hard food or objects are potential pathways for bacteria and noxious stimuli to irritate the dental pulp.



Cracked tooth.



Crack seen after removal of restoration.

- **Traumatic injuries** to the face and mouth from sports or other accidents can cause teeth to fracture, loosen or even be knocked completely out of the socket (avulsion). Any damage of the tooth structure, surrounding gum or supporting bone will allow bacteria colonisation from saliva, leading to an inflamed dental pulp.



Trauma to upper front teeth.



Avulsed upper right central incisor.

- **Excessive wear of the hard outer layers (enamel and dentine)** of the tooth due to parafunctional habits like grinding of teeth also make the dental pulp more vulnerable to bacterial or acidic attack.



Excessive wear on upper and lower teeth.

SIGNS AND SYMPTOMS

- Unprovoked pain
- Pain on biting
- Prolonged sensitivity to hot or cold
- Discolouration of the tooth
- Tenderness of the overlying gums
- Abscess or swelling

Sometimes, there may be no symptoms at all. When the dental pulp inflammation or infection is left untreated, it can eventually cause severe pain, abscess (swelling) and loss of the supporting bone.



Gum boils or discharging sinus tracts.



Swelling of lower right jaw.

It is best to consult with your dentist if you have any of the symptoms mentioned for a more accurate diagnosis and treatment.

DIAGNOSIS

Diagnosis of the dental pulp status of your tooth is done by your dentist using clinical examination and investigations. Some of these investigations include:

- **Pulp vitality tests**, such as thermal tests or electric pulp tests. These are used to determine if the dental pulp is still alive.
- **X-rays** (radiographs) are used to determine the extent of tooth decay and surrounding bone inflammation caused by dental pulp infection.

TREATMENT

Treatment is determined by the diagnosis.

If the stage of dental pulp inflammation is assessed to be reversible, it can be resolved by eliminating the causative factors e.g. removing the decay and restoring or filling the tooth, sometimes with a medicament base, to return the dental pulp to its normal healthy state.

However, if the dental pulp is irreversibly damaged or infected, root canal treatment has to be carried out.

Root Canal Treatment

Root canal treatment (RCT) treats diseases and injuries to the dental pulp so as to conserve the tooth that will otherwise have to be extracted. The procedure is relatively comfortable and often painless as the tooth is anaesthetised during treatment.

- Removal of the infected or inflamed dental pulp is the first step of RCT. Under local anaesthetic, an opening is made in the crown of the tooth to get access to the infected or inflamed dental pulp within.
- All RCT procedures are done by isolating the tooth with a rubber dam to provide a clean and saliva-free environment.



Rubber dam isolation and access into the tooth.

- Using small, specially-designed hand or rotary files, the root canals are cleaned and shaped to a form that can be sealed. Debris within the canals is removed by flushing with an anti-bacterial solution.



X-ray showing files in root canals.

- The canals are finally filled or sealed with an inert material called gutta-percha.



Gutta-percha root filling with permanent restoration.

The tooth should be restored to full shape and function by either a permanent filling or a crown, depending on how much of the tooth is left. This should be done as soon as possible as there could be a risk of tooth fracture due to biting forces.

RCT may be done in single or multiple visits depending on the tooth complexity.

In between treatment appointments, medicaments may be placed within the canals and the tooth is covered with a temporary filling. Often, X-rays are taken to determine the length of the root and to monitor the various treatment stages.

A root canal treated tooth can function normally and can be maintained with routine dental care and oral hygiene measures.

PREVENTION

Regular check-ups with your dentist and practising good oral hygiene are the best modes of prevention. Decay or a defective filling can be detected and treated early before there is irreversible damage to the dental pulp.



Avoid cracked teeth – do not chew on hard objects.

Avoid chewing on hard objects such as ice, hard nuts or pens so as to prevent cracked teeth.

You should wear a mouth guard if you participate in contact sports to avoid dental trauma. Any activity involving speed has an increased chance of falling and the potential of getting in contact with a hard piece of equipment.

A mouth guard helps to distribute the force of impact in any accident to prevent the likelihood of dental injury to the front teeth.

Do not clench or grind your teeth. If you clench or grind your teeth at night, speak to your dentist about getting a night guard.

Restoration of Natural Teeth

Natural teeth may be damaged by a variety of reasons including tooth decay, trauma and excessive wear. Dentists are able to save heavily restored or structurally weak teeth back to their original colour and shape using a variety of techniques which include crowns and veneers.

TREATMENT

CROWN

A crown is a cap placed over a tooth and held in place by dental adhesive or cement. Crowns are fabricated

in the laboratory using different materials including plastic, ceramic or metal alloys. These materials make it possible to maximise strength and simulate the appearance and colour of natural teeth.

Crowns are used for several reasons:

- As a **protective cover** for badly decayed or fractured teeth.
- As a **permanent restoration** for teeth with large fillings.
- To **correct minor problems** in natural teeth (e.g. spacing, irregular shape, discolouration).



How a crown corrects discoloured teeth.

PROCEDURE

At the first appointment, the dentist conducts a thorough clinical examination using radiographs. The suitability for crowns is assessed and any preparatory work is carried out. Your dentist will also be able to advise on material choices, treatment sequence and any other concerns you may have.

At the second appointment, the teeth to be crowned are prepared. This involves reduction of the tooth size (usually under local anaesthesia) followed by an impression or mould of the prepared tooth. This trimming of the tooth is required to create space for the crown to be fitted.

The mould is then sent to a laboratory where skilled technicians will fabricate the crown. Meanwhile, a temporary crown is made and fitted onto the trimmed tooth.

At the third appointment, the temporary crown is removed and the tooth surfaces cleaned. The completed crown is tried on for fit, harmony with the bite and appearance. The crown is finally cemented onto the prepared tooth with dental cement.

Daily brushing and flossing are essential for good oral health as well as to keep the crown trouble-free. The most vulnerable part of the crown is the margin or junction between the tooth and crown.



Prepared tooth ready to be fitted with crown.



Tooth with crown fitted on.

Missing Teeth and Tooth Replacement

Teeth can be lost when they are irreversibly damaged due to dental decay or trauma. Gum disease can also affect the supporting bone and gum, leading to the loosening of teeth and eventual loss.

When teeth are lost, there are several methods that can be used to replace them. These include dental implants, bridges and dentures. When the infected tooth cannot be saved and has to be removed, prosthesis replaces the missing tooth to restore speech, function and aesthetics.

TYPES OF TOOTH REPLACEMENT

1. DENTAL IMPLANTS

Dental implants are a substitute for a missing tooth root. Due to its durability and strength, they are ideal as tooth substitutes.

Implants can be used to replace a single tooth, multiple missing teeth or to replace teeth in cases with complete tooth loss. Therefore, in almost

any situation, a missing tooth can potentially be treated with this method.

Almost all dental implants used today are made from titanium alloy. It is commonly cylinder- or screw-shaped.

Each implant is carefully and precisely drilled into the location of the intended tooth and provides a firm and stable foundation for long-term support of the replacement teeth. These materials have been shown to be well-tolerated by the body and are used as supports in the fabrication of prosthesis to restore function and aesthetics.

PROCEDURE

The treatment is carried out by a team of restorative specialists and surgeons working in close collaboration.

Your dental surgeon will assess your suitability for treatment with these implants, taking into account various considerations such as your bone volume and quality, tooth and jaw relationship, oral habits and general medical health. This may include a detailed analysis using different X-rays and scans.

Normally it takes about four months to a year to complete the entire treatment. This would depend on case complexity as well as the need for additional procedures like bone grafting.

Phase 1: Treatment Planning

A thorough assessment of your medical health, oral health, the way your teeth fit together and bone volume will be done to produce an individualised treatment plan.

Phase 2: Surgical Treatment

A minor surgical procedure is carried out to place titanium fixtures into the bone. If bone and/or soft tissue are insufficient, there may also be a need for additional grafting procedures before the implants can be placed.

Phase 3: Restorative Treatment

After the integration of the implant fixtures to the bone, 'new permanent teeth' will be designed and fabricated.



2. BRIDGES

A bridge is a fixed prosthesis that replaces missing teeth by using neighbouring teeth as support. Healthy neighbouring teeth are trimmed and the bridge unit is fixed on them. A small number of

missing teeth can also be replaced if the neighbouring teeth are sufficiently strong.

A bridge can be made of ceramic or a combination of metal alloys and ceramics to maximise strength and simulate a natural appearance.



Prepared teeth ready for bridge fitting.

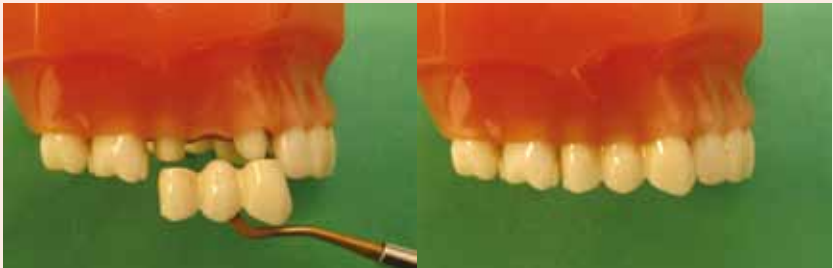


Teeth with bridge fitted on.

Types of bridges

- **Conventional bridge**

This consists of two crowns joined to an artificial tooth that is meant to replace the missing tooth. The healthy neighbouring teeth are trimmed and the bridge unit is fixed onto them.



Conventional bridge – two crowns joined to an artificial tooth to replace the missing tooth.

- **Resin-bonded bridge**

This requires minimal trimming of neighbouring teeth on their back surfaces. Cement is used to bond the bridge structure to the back of these teeth. Although this method conserves more of the neighbouring teeth's structure, not all patients are suited for it. Your prosthodontist will advise you on the technique most suited for your condition.



Resin-bonded bridge – cement is used to bond the bridge structure to the back of these teeth.

PROCEDURE

Your dentist will need to assess important factors such as the number of missing teeth, the condition of the neighbouring teeth and as well as those of the supporting gums and bone prior to advising you on making a bridge. Your dentist will also be able to advise on alternative ways of replacing missing teeth after a clinical examination.

The procedure itself requires at least two visits on an outpatient basis to complete.

The first visit usually involves trimming the teeth under local anaesthetic, making an accurate mould for the dental laboratory to fabricate your prosthesis and placement of a temporary bridge for you to function in the interim period.

At the second appointment, your dentist will remove the temporary bridge and check for the fit, bite and look of the final bridge before cementing it in place.

Maintenance care for bridges is similar to that for crowns. The focus is on regular flossing, brushing as well as regular check-ups.

3. DENTURES

A denture is a removable prosthesis used to replace missing teeth. Commonly referred to as 'false teeth', it is usually made of acrylic or a combination of acrylic and metal. A partial denture is fitted to replace some missing teeth whilst a complete denture is indicated when all natural teeth are missing. A good set of dentures helps you to eat, speak, function and often makes the person look better.



Partial denture



Complete denture

PROCEDURE

Depending on the complexity of each case, the duration of the treatment will take about two to six visits. After the initial visit for examination and diagnosis, the subsequent visits will include making impressions of the mouth (getting the shape of your gums and soft tissues), bite registration (checking how your upper and lower jaw relate to each other), try-in of the denture (to check for how the final denture will look like), issue and review.

In certain cases, especially when all natural teeth are absent, dental implants may be used to aid in anchoring the dentures so that they do not move during function. Your dentist will advise you if you are suitable for the use of dental implants to retain your dentures.



Clips on underside of denture.



Clips on underside of denture and in the mouth.



Implant-retained dentures replacing multiple missing teeth.

Aesthetic Dentistry

1. TOOTH WHITENING

Tooth whitening or bleaching is a process where the tooth discolouration is 'whitened' to a lighter shade. It removes the staining agent through chemical means. It is a safe procedure when carried out under professional supervision. Teeth can discolour for various reasons. Some teeth are more yellow than others, while others yellow with ageing. Some of the factors which can affect natural tooth colours are:

- Use of tobacco
- Drinking coffee, tea, colas or red wine
- Consuming pigmented foods and drinks
- Accumulation of plaque or tartar deposits
- Severe fluorosis
- Treatment with the antibiotic tetracycline during childhood
- Trauma to the teeth that may cause a brown, grey or black colour

Treatment results usually depend on the severity of the discolouration. Both vital (i.e. live) and non-vital teeth (e.g. root canal treated) can be bleached and may take several visits to complete.

Bleaching or tooth whitening is not effective on dental restorations such as amalgam or tooth-coloured fillings, metal or porcelain crowns, etc. People with worn tooth enamel, receding gums, sensitive teeth, untreated cavities, and heavily restored teeth should consult a dentist before undergoing any teeth whitening procedures.

Your dentist will be able to recommend the most ideal method of teeth whitening treatment after an in-office examination, when the cause and nature of your tooth discolouration can be established. Your dentist will also provide you with more information on the various types of whitening procedures available, their duration and frequency of treatment.

Whitening methods include:

i. In-office Chair Side Bleaching

- For the busy individual who wants 'instant' results.
- Teeth can be whitened in one sitting within one to two hours.
- Light-activated bleaching gels to speed up the process, severely discoloured teeth may need repeat treatment.
- With proper care, results can last one year.

ii. Dentist-supervised Home Bleaching

- A customised tray to hold the bleach.
- You will be provided syringes of the bleaching gel and taught how to use it.
- Bleaching is done at your convenience at home, for one hour a day.

- This method of tooth whitening is less costly than in-office bleaching. The bleaching process is gradual, over a few weeks, but is kinder to your teeth.
- Your dentist will review your progress regularly until the desired shade is achieved.



Tooth whitening results depend on the severity of discolouration.

iii. Non-vital bleaching

A tooth can discolour after root canal treatment has been performed on the tooth and it usually has a much darker appearance as compared with adjacent teeth.

Non-vital bleaching involves placing the bleaching agent into the pulp chamber of the root canal treated tooth. This can help to lighten the colour of the tooth in some cases. Root canal treated teeth with larger restorations or severe discolouration that cannot be corrected by non-vital bleaching are better crowned.

Procedure:

- A bleaching compound is placed inside the pulp chamber and sealed within the tooth.
- The patient is reviewed in two weeks and if the tooth has been whitened sufficiently, the bleaching compound is removed and the tooth restored.

2. VENEERS

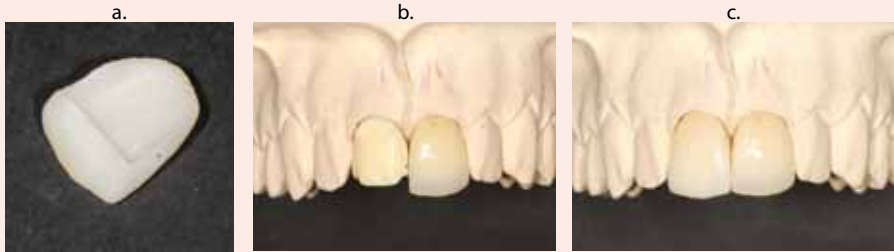
Veneers are thin, custom-made shells crafted of tooth-coloured materials designed to cover the front side of teeth to improve the overall appearance of teeth. They are made of either thin plastic resin or porcelain. Veneers are placed to:

- Correct poorly-formed or mildly-malpositioned teeth
- Close gaps between teeth
- Mask internal stains
- Restore partially broken-down teeth

PROCEDURE

Tooth preparation is minimal and confined to the enamel structure. The veneer is bonded to the tooth structure with tooth-coloured resin cement. Like crowns, several visits are necessary to complete treatment.

Patients should be aware that this is usually an irreversible process, because it is necessary to remove a small amount of enamel from your teeth to accommodate the shell.



The appearance of teeth can be corrected by porcelain veneers.

3. AESTHETIC GUM SURGERY

Your dentist or the gum specialist may advise surgery to improve or correct the gum appearance or to adjust the gum and bone level for the restorative treatment of your tooth. This type of gum surgery can be considered as a minor operation under local anaesthesia.

Some reasons why aesthetic gum surgery may be prescribed are as follows:

i. To lengthen the tooth crown by exposing more of the tooth structure

Your tooth requires a restorative or cosmetic dental procedure such as a crown or bridge but as your tooth is decayed or its structure broken below the gum line, there is limited tooth structure for a proper

restoration. Crown-lengthening adjusts the gum and bone level to expose more of the tooth in order for it to be restored adequately.



(i) Tooth crown is lengthened by exposing more of the tooth structure.

ii. To improve the appearance of your gum line if your teeth are covered by too much gums (e.g. 'gummy smile')

You may not like the way your upper teeth shows when you smile because it appears short as a result of being covered with too much gum tissue. To correct this, your periodontist performs an aesthetic crown-lengthening procedure on the affected teeth to enhance the gum line for a more natural broad smile.



(ii) The gum line is adjusted for a more natural broad smile.

iii. To graft the teeth areas where there is gum recession, thus helping prevent further recession or root sensitivity

Gum recession due to various causes can lead to exposed tooth roots which may then result in root sensitivity, food plaque accumulation or an uneven gum line with the neighbouring teeth. Gum graft surgery aims to cover the gum recession area and help to prevent further recession and the loss of its underlying bone. During this operation, gum tissue is taken from the palate gum area and then stitched to cover the exposed root.

After healing, tooth sensitivity may be reduced and the aesthetics of your smile is improved, in addition to improved gum health!



(iii) Gum graft surgery to help prevent further gum recession or root sensitivity.

The White Spots in Early Childhood Caries

Tooth decay in children under the age of 6 is termed Early Childhood Caries (ECC). In Singapore, 55% of preschool children are affected by ECC. Whether caries occurs in adults or children, it is 100% preventable.

We are all familiar with the appearance of a hole or a cavity in our teeth. However, by the time a layman sees this cavity, it is irreversible and necessitates expensive dental intervention. This is particularly true in primary teeth, where you start off with thinner enamel and dentine. If there is a stage in the disease process where the disease can be reversed, would you be interested?

WHAT ARE WHITE SPOT LESIONS?

The process of tooth decay takes time and does not happen overnight. It usually begins with early signs of ECC, which present as White Spot Lesions (WSL) on tooth surfaces. These white spots appear as chalky areas on the enamel surface. They are often found under plaque.

WSL are signs of enamel demineralisation. The WSL is the precursor to the cavity. As demineralisation progresses, parents often complain that their child's teeth keep breaking off, or they can scrape bits of tooth off. WSL can turn brown and the tooth surfaces will start to break off to form cavities.

Untreated cavities can lead to pain, swelling, loss of appetite and sleep, damage to the developing permanent teeth, or in severe cases, systemic infection.

WSL are not obvious to caregivers unless you look for them. They do not cause pain. **It is only at this stage that decay can be reversed.** Once the WSL has progressed to become a cavity, reversal is not possible.



White spot lesions on tooth surfaces (white arrows). As white spot lesions progress, they become cavities (red arrows).

REVERSING EARLY DECAY: CAUSES AND PREVENTION

In order to reverse WSL, you have to understand the factors that cause it. An interaction of many factors results in ECC. These causes include (but are not limited to):

- **Pool oral hygiene** resulting in accumulation of plaque
- **Prolonged use of milk bottle** filled with milk or sweetened liquids as a comforter to soothe the child to sleep
- **On-demand breastfeeding** throughout the night without considering oral care measures
- **Streptococcus Mutans** is a caries-causing bacteria which is transmittable from caregiver to infant through acts like sharing of food and eating utensils

Prevention is the best option in the management of ECC. If you find a white spot lesion or lesions on your child's teeth, you should bring

your child to the dentist as soon as possible. You have a small window period whereby prevention and early treatment can be done.

While waiting for your appointment, read the checklist below for preventive steps recommended.

- Children are recommended to have their first dental visit by age one or when the first teeth erupt.
- Keep good oral health if you are pregnant and/or have a young child.
- Avoid filling your child's nursing bottle with liquids such as sugar, water, honey or soft drinks.
- Do not allow your child to fall asleep with a bottle containing milk, formula, fruit juices or sweetened liquids.
- If your child needs a comforter between regular feedings at night or during the day, give him/her a bottle of cool water instead.

- Wean your child off the milk bottle by age one.
- Clean your child's teeth with a damp washcloth or gauze pad after each feeding. Begin brushing your child's teeth as soon as the first tooth erupts.
- Fluoridated toothpaste should be used. The type of toothpaste will be recommended by the dentist depending on child's caries risk.

Early preventive dental visits enable the dentist to assess the child's risk of getting ECC, catch the early signs of ECC (if any), and recommend appropriate customised preventive measures to arrest and prevent the progression of the disease.



Bring your child to the dentist by age one or when the first teeth erupt.

Adult Caries

Dental caries is one of the most common diseases in the world. It is a bacterial disease that results in a continuing loss of mineral ions from the tooth structure due to the presence of acid-producing oral bacteria and is the process that leads to tooth decay.

Tooth decay is the cause of cavities, pain, tooth loss and infection. It is the main reason why people seek dental treatment such as fillings, root canal treatment, extractions and other costly complicated dental procedures.

In the early stage of the disease, a white spot starts to form on the tooth surface. At this stage, the decay process is reversible as the tooth surface is still intact. If the caries disease is not treated, the continued loss of tooth minerals from the tooth results in the formation of a cavity, and the process then becomes irreversible. In severe cases, the caries can spread to the dental pulp causing pulpal infection.

CAUSES

1. Poor oral hygiene
2. Consumption of sugary foods and drinks
3. Frequent snacks between meals
4. Inadequate saliva flow and function

At the National Dental Centre Singapore we not only treat the effects of the caries disease, i.e. cavities, pulp death, infection, etc, we also help you to identify the risk factors contributing to the progress of your disease. We are then able to **customise** a caries management programme to help you control the disease more effectively.

Caries disease is a totally preventable disease, and with correct intervention, early caries can be reversed. A simple **Caries Assessment Test (CAT)** can be carried out to assess your risk for caries disease. Prevention is better than cure and in the case of dental caries, prevention is certainly more cost-effective, less time-consuming and best of all, pain-free!



Early caries white spot lesions: Intact tooth surface with mineral loss.



White spot lesions progressing towards cavitation.



Advanced stage of dental caries:
Cavitated lesions.

What does the Caries Assessment Test comprise?

In order for us to prevent dental caries, we must first understand that it arises from a complex interaction of bacteria and sugar on our teeth over a period of time. Sugar may come from various food sources, and not just sweets. In addition, caries formation is affected by numerous factors such as saliva, diet, oral hygiene habits and even lifestyle.

Every individual will have a different predisposition towards dental caries. Once a basic dental examination is done, our dentists can carry out the CAT by providing you with:

- Comprehensive education on the process of tooth decay
 - Clinical and radiographic assessment of the caries activity level of each tooth in your mouth
 - Diet analysis
 - Saliva analysis to assess whether your saliva is healthy and able to adequately protect your teeth
 - Plaque analysis to determine its bacteria and acidity levels
- These tests are quick and painless and will help in identifying the factors predisposing you to caries disease.
- With these results, a **preventive strategy** tailored to your needs will be designed. The strategy will include:
- Modification to lifestyle and/or prescription of safe therapeutics for home use
 - Introducing a tooth brushing method tailor-made for you
 - Incorporating calcium- and fluoride-based remineralisation therapies, such as putting concentrated fluoride on your teeth to control or reverse early caries lesions
 - Starting painless, minimally invasive treatment such as sealing the deep grooves on the chewing surfaces of teeth, if necessary

Am I a suitable candidate for the CAT?

- Do you have a past history of fillings, extractions and complex dental work?
- Do you have new cavities detected or existing fillings that need to be replaced at each recall visit?
- Do you regularly consume soft drinks and sweets?
- Are you wearing braces or partial dentures?
- Do you have a history of or are currently undergoing radiation therapy?
- Have you been diagnosed with gum disease or are being treated for the condition?
- Does your mouth feel dry?

If you experience any of the above, understanding your risk for caries is half the battle won. The best results are achieved when patients are committed to following the prevention strategies drawn up between the dentists and themselves. Caries can recur at any stage in your life, even after this test. However, partnering responsibly with your dentist improves tremendously the chances of it **NOT** becoming an irreversible disease in your life.

- 1. Early decay can be REVERSED.**
- 2. Understand your risk for caries.**
- 3. Ask your dentist for more information on the Caries Assessment Test (CAT).**

Crooked and Poorly Aligned Teeth (Malocclusion)

People have their teeth straightened for a variety of reasons. These include:

- **Improving facial appearance**
- **Improving speech and/or chewing function**
- **For dental health**

Dental health is the most important reason to have braces made as poorly aligned or crooked teeth are difficult to keep clean. They often give rise to decay and gum problems. For most people, orthodontic treatment with braces is an elective procedure. It is rare that teeth will be lost if treatment has not started. There is no age limit for orthodontic treatment – adults can benefit from it too.

There are alternative solutions to orthodontic problems. These are prosthodontic treatments using tooth veneers, crowns, bridges or dentures or no treatment at all. The orthodontist will discuss the risks and benefits of each alternative with you.

CAUSES AND DIAGNOSIS

Although many cases of malocclusion are inherited, there are some conditions or habits that may alter the

alignment of the teeth. These include:

- Prolonged use of a pacifier or bottle feeding in early childhood
- Thumb sucking in early childhood
- Injuries that result in the misalignment of the jaw

Malocclusion of teeth is typically diagnosed through routine dental exams. Your dentist will examine your teeth and may perform dental X-rays to determine if your teeth are properly aligned.

TREATMENT

There are many different types of braces, each suited to a particular type of problem. The best type of brace for you will be advised by the orthodontist depending on your teeth and your personal needs.

1. Fixed Braces

Fixed braces are small attachments called 'brackets' that are attached to the front of each individual tooth with a special adhesive, linked together by orthodontic wires. These attachments can be made of metal or a tooth-coloured material like porcelain (ceramic). Many

teenage patients choose vibrant colours to customise their metal braces.

Self-ligating braces incorporate features (innovative ways of holding the wire in place) to help the teeth move more smoothly and so make treatment quicker.



Fixed braces

2. Invisible Aligners

Clear aligners are clear removable braces which gradually straighten teeth when worn all the time. They are virtually unnoticeable and are good for less severe cases. These aligners are usually worn full time and removed when eating and brushing. The aligners move your teeth gradually and are changed every two weeks until its completion.



Invisible aligners

3. Lingual Braces

Lingual braces are fixed braces which are attached to the back of the teeth rather than the front. This means they are truly invisible so you can continue to smile with confidence throughout treatment.

As lingual braces are not visible, they are ideal for adults or older teenagers who are concerned about the appearance of traditional fixed braces. Lingual braces are invisible when the patient smiles.

Your orthodontist is the best person to recommend the bracing system best suited to your lifestyle and malocclusion.



Lingual braces

Retainers After Treatment

After your orthodontic treatment is finished, you will need retainers to hold your teeth in their new positions. Your orthodontist will prescribe the retention plan that is best for you.

To avoid the risk of late crowding in adult patients, it is often prescribed that they usually sleep with their retainers on for the rest of their lives, if they want their teeth in perfect alignment.

ORTHODONTIC TREATMENT: HOW LONG DOES IT TAKE?

Orthodontic treatment with fixed braces generally takes two to three years. The braces are fixed permanently on the teeth until the completion of treatment.

You need to visit your orthodontist regularly (four to eight weeks interval) for treatment follow-up.

For a successful outcome, you need to maintain good oral hygiene by brushing regularly, especially after every meal and snack. To do that, do remember to bring a travel toothbrush with you when you are not at home and avoid eating hard, sticky foods.

Jaw Malalignment

Jaw malalignment happens when the upper and lower jaws where the teeth are based are not aligned. It affects not just your facial appearance but also your bite, speech and chewing. Oral hygiene is harder to maintain with poor bite and crooked teeth.

EARLY TREATMENT OF JAW MALALIGNMENT

Jaw malalignment and damaging bites may be treated before puberty. The best age for treatment for jaw malalignment and damaging bites can range from 7 to 14 years old. Your child's orthodontist is the best person to recommend the correct mode and timing of early treatment. **Your child should see an orthodontist at age seven for an assessment.**

Deficient Growth of Jaws

Deficient growth of the upper jaw can be treated using a facemask or reverse pull headgear. A narrow upper jaw can

be treated with an expansion screw. Deficient growth of the lower jaw can be treated by functional appliances.

The success of treatment depends on compliance with appliance wear and the natural growth potential of the child.

Excessive Growth of Jaws

Upper jaw growth can be restricted using a headgear. The success of treatment depends on compliance with appliance wear.

Restriction of lower jaw growth is often unpredictable and prone to relapse. Such treatment is rarely undertaken.

Treatment of Bite

When the jaws are misaligned, teeth may be forced to a bite in a manner which is damaging to the health of the teeth and gums. If left untreated, this can lead to loosening and early loss of teeth.

Teeth can be brought out of a damaging bite using fixed or removable appliances. The bite may need to be propped up with cement or plastic blocks in order to align the teeth. The success of treatment depends on compliance with appliance wear and maintaining good oral hygiene.



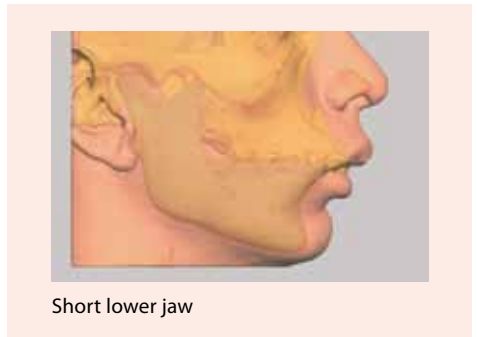
Upper removable appliance

In adults, these disharmonies of jaw size or position can only be corrected surgically.

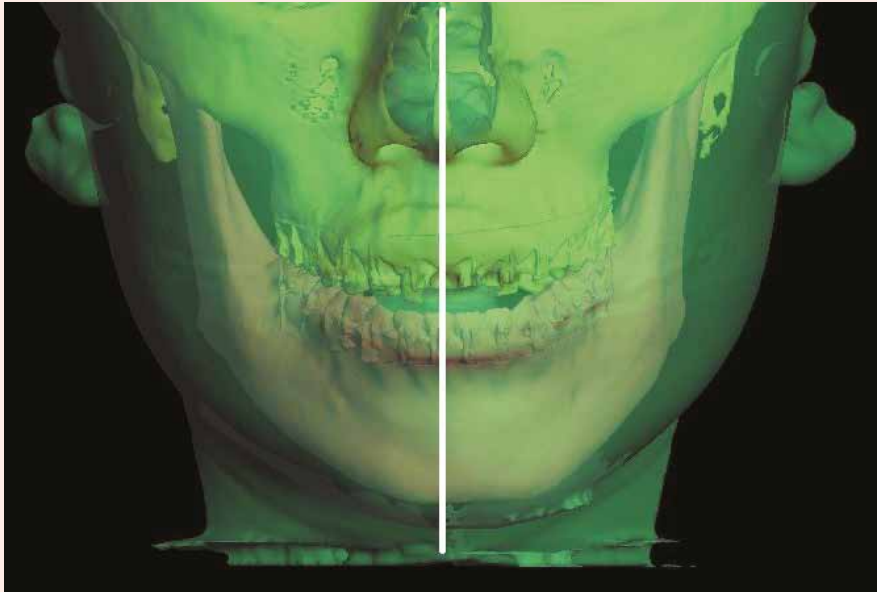
SURGICAL TREATMENT OF JAW MALALIGNMENT

Some of the common problems are best dealt with a combined braces and surgical treatment approach known as Orthognathic Surgery. These are:

- Long or short jaws
- Excessive show of gums (i.e. gummy smiles)
- Overall elongation of face
- Facial asymmetry
- Facial deformities



Short lower jaw



Facial asymmetry (computer 3D image of patient)

Orthognathic surgery is a predictable treatment option for complex dental/ facial problems. It ensures the best possible results, both functionally and aesthetically. The lasting reward is a healthier and happier you.

Treatment is carried out in 4 phases:

Phase 1: Treatment Planning Phase

Treatment planning is carried out jointly by an orthodontist and an oral and maxillofacial surgeon. The orthodontist determines how braces will align your teeth in preparation for surgery. The oral and maxillofacial

surgeon studies your jaw deformity and decides on the type of surgery most appropriate for your case. This initial phase of treatment will include consultation, records-taking and discussion of the treatment plan with you.

Phase 2: Presurgical Orthodontic Phase

Many patients undergo an initial period of presurgical orthodontic treatment, where braces are fixed to align the teeth. This phase may take 9 to 18 months. The actual time taken depends on the condition, the patient's age, cooperation and other factors. During this time, patients are seen at intervals of four- to six-weekly intervals.

At the end of this phase, the teeth are aligned so that they will fit into a good bite after surgery.

Phase 3: Surgical Phase

Surgery is scheduled when the presurgical orthodontic phase is completed. Inpatient surgery is needed to correct the malalignment in the jaw and face by making cuts in the bones and repositioning them in their desired alignment. Braces used to align teeth prior to surgery are left in place during the surgical procedure. They help to stabilise the teeth and jaw bones after surgery.

Phase 4: Postsurgical Orthodontic Phase

After surgery, postsurgical orthodontics is continued to achieve final alignment of the teeth and to retain them in their new position.

Wisdom Teeth

Wisdom teeth are the permanent third molars. Most people have four wisdom teeth – two in the upper jaw and two in the lower jaw.

CAUSES

Wisdom teeth usually erupt between the ages of 16 and 21, a period which has been termed 'the age of wisdom'.

SIGNS AND SYMPTOMS

Improperly erupted wisdom teeth are breeding grounds for bacteria and

may cause tooth decay, sometimes even affecting the neighbouring teeth. Infection of the overlying gums can take place as well, resulting in pain and swelling.

More serious problems such as the formulation of cysts or tumours around an impacted tooth can occur, leading to destruction of the surrounding jawbone and neighbouring teeth. These conditions may require complex and extensive treatment. As problems can develop silently without your knowledge, a check-up with your dentist is thus advisable.



Impacted wisdom tooth causing decay in the second molar.



X-ray image showing cyst formation around wisdom tooth.

DIAGNOSIS

Your initial visit to the dentist would include an examination of your mouth and X-rays to determine the position of the wisdom teeth, their condition and the status of the adjacent teeth and bone.

Wisdom teeth are impacted when it is obstructed from erupting fully into the mouth, either by the tooth in front of it or the surrounding bone or gums. To prevent such problems from arising, it is advisable to remove them early.



X-ray depicting four impacted wisdom teeth.

TREATMENT

This is a minor surgical procedure which can usually be performed with little discomfort. The procedure can be performed under local anaesthesia (with or without sedation to control anxiety) or general anaesthesia. Your surgeon will advise you on the type most appropriate for your needs.

The surgery involves uncovering the tooth by lifting the overlying gums aside to expose the tooth and bone. The tooth may need to be sectioned in order to remove it. The gums are then stitched back.

After Surgery

After surgery, some minor bleeding from the wound can be expected, which can be controlled by biting on a piece of gauze over the operated area for about half an hour. Facial swelling and discolouration of the overlying skin will also develop, increasing for the first 72 hours and subsiding thereafter. You may not be able to open your mouth as wide as usual for a few days.

Painkillers, antibiotics and an antiseptic mouthwash are usually prescribed after the surgery. You will be advised to maintain good oral hygiene and also to keep to a soft diet for a few days following surgery.

Temporomandibular Joint Disorder

Temporomandibular Joint Disorder (TMD) is a group of conditions that cause pain and loss of normal function to the temporomandibular joint (TMJ) or jaw joint. The temporomandibular joint is located in front of the ear, on both sides of the head.

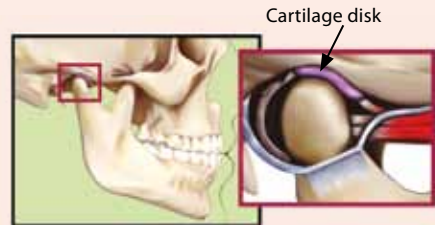
The joint is made up of the lower jawbone and the skull. A cartilage disk, which functions as a shock absorber and joint lubricant, separates these two bones. The TMJ and the muscles of chewing enable you to open your mouth, talk and chew.

TMD can originate from the chewing muscles, cartilage disk or the joint bone.

TEMPOROMANDIBULAR JOINT POSITIONS

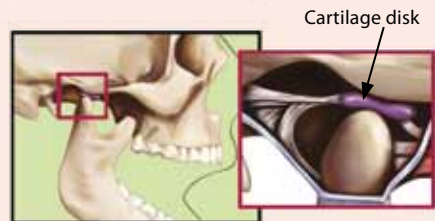
Normal Closed Position

The lower jawbone is separated from the skull by a cartilage disk that acts as a cushion when the joint is in function i.e. chewing, speaking and yawning.



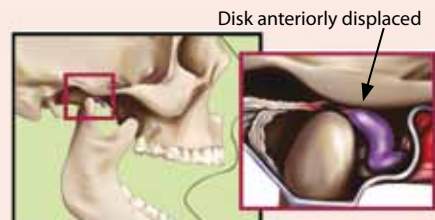
Normal Open Position

On the opening of the mouth, the disk will follow the lower jaw bone and they will move together when you move your jaw up and down or side to side.



Abnormal

In an abnormal joint, the disk can be displaced or torn. This displaced or torn disk can cause obstruction in joint movement. A torn disk can result in excessive wear of the bone of the joint, causing inflammation and pain.



CAUSES

TMD can be caused by:

- **Prolonged stress to the jaw joint.** Habitual clenching or grinding of your teeth overloads the joint, causing pain in the joint and muscles. You may not be aware of these habits if they occur during sleep.
- **Trauma.** A recent trauma or a history of trauma, such as a blow to the lower jaw or face, whether directly or indirectly, can injure the TMJ.
- **Arthritis.** The jaw joint may be damaged by arthritis (inflammation of the joint). Arthritis may be a degenerative process due to ageing or it may be associated with medical conditions such as Rheumatoid Arthritis and Psoriatic Arthritis.
- **Pain.** Dull pain, on opening and closing of the mouth, can be experienced over the jaw joint area (just in front of the ear) or at the cheek or at the temple region. A clicking or grating sound may accompany the pain. The pain is usually due to inflammation of the joint and/or the muscles, and may cause difficulty in chewing and biting food. Sometimes you may experience headaches.
- **Restriction in mouth opening and closing.** Trauma, excessive pressure or degenerative changes to the joint can cause displacement of the cartilage disk in the joint. This causes obstruction to the normal movement of the joint, leading to difficulty in opening and closing your mouth.
- **Worn-down, cracked and fractured teeth.** Teeth may be worn down as a result of nocturnal grinding and you may experience teeth sensitivity. Teeth may also be cracked and fractured as a result of nocturnal grinding and clenching. This leads to pain and difficulties in chewing.

SIGNS AND SYMPTOMS

- **Noises.** You may hear clicking or grating noises on opening or closing your mouth. If this is not accompanied by pain and limitation in mouth opening, no treatment is required.

You may experience difficulty in eating and a sudden inability to close your mouth, which may or may not be spontaneously resolved.

SIGNS OF TEMPOROMANDIBULAR JOINT DISORDER



Dull pain, on opening and closing of mouth



Headaches



Restriction in mouth opening and closing

DIAGNOSIS

Seek a consultation with your dentist. Most common issues are related to the masticatory muscles. Jaw disk displacements are also commonly encountered. Arthritis changes jaw joints which can also cause jaw discomfort.

A routine X-ray scan of the upper and lower jaw helps to rule out obvious bony lesions. Sometimes, more complicated imaging may be necessary.

TREATMENT

TMD may be treated surgically or non-surgically, depending on the diagnosis and the cause.

- 1. Medications.** Some anti-inflammation drugs can be helpful in reducing the pain associated with TMD.
- 2. Therapies.** Some TMD symptoms can be relieved with the use of a bite guard. A bite guard is especially useful for patients who grind their teeth during sleep.



A bite guard

3. Surgery. Surgery may be one option for patients who do not respond well to non-surgical treatment. Surgery may range from simple washing of the joint with fluids (arthrocentesis) to inserting a small scope into the joint to examine and treat the joint (arthroscopy).

4. Restoring natural teeth. Worn-down teeth may need to be crowned.

5. Counselling and stress management.

PREVENTION

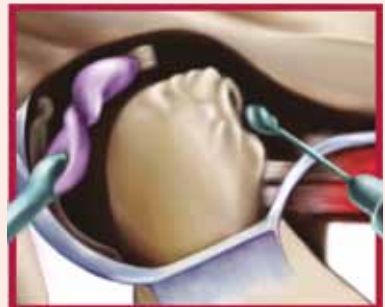
- Strive for a balanced lifestyle. Stressful episodes predispose one to more grinding and clenching of the teeth.
- Excessive chewing on hard foods.
- Seek help when you encounter the signs and symptoms and TMD.



Arthrocentesis: Flushing fluid from the joint and gently stretching it.



Arthroscopy: Using a miniature telescoping instrument to diagnose and repair the joint.



Arthrotomy: Open joint surgery for more complex cases.

Sleep Disorder

Obstructive sleep apnoea is a potentially serious disorder where breathing typically stops for at least 10 seconds, more than 5 times per hour during the night. These pauses in breathing are called apnoeas. It is also the most common form of apnoea, although many adults may not even know they have the condition.

Apnoea cuts off the oxygen supply to the body and the rise in carbon dioxide eventually awakens the patient who gasps for air, making a snorting sound.

Obstructive hypopnoea, is another less severe form caused by incomplete airway obstruction. Breathing is continuous but shallow and is accompanied by snoring and decrease in blood oxygen.

CAUSES

It occurs when the tissues at the back of the upper throat collapse during sleep, blocking the air passage even though the action of breathing continues.

SIGNS AND SYMPTOMS

- Snoring with pauses in breathing (apnoea)
- Restless sleep
- Excessive daytime sleepiness
- Morning headaches
- Poor judgement and memory loss
- Irritability and impaired mental or emotional functioning
- Frequent visits to the bathroom at night



One of the symptoms of sleep disorder is restless sleep.

DIAGNOSIS

If you think you may have sleep apnoea, see a sleep specialist who can take a detailed history and perform a head and neck examination. If the doctor suspects a sleep disorder, then you will be referred for an overnight sleep study (polysomnography).

The sleep study is the gold standard for diagnosing snoring and sleep apnoea. It tracks your brain, heart and eye activity as well as the breathing and blood oxygen level patterns. Sleep experts will track episodes where breathing is shallow or stops for longer than 10 seconds.

Apnoea is significant if more than five episodes per hour are reported. If there are more than 15 episodes per hour, the condition is serious.

TREATMENT

Given the long-term complications of sleep apnoea, it is important for patients to undergo treatment. Due to its association with heart problems and stroke, sleep apnoea that does not respond to lifestyle measures should be treated by a physician, ideally a professional specifically trained to treat sleep disorders.

NON-SURGICAL TREATMENTS

1. **Continuous Positive Airway Pressure (CPAP)**

At this time, the most effective treatments for sleep apnoea are devices that deliver slightly pressurised air (CPAP) to keep the throat open during the night. CPAP is done through a mask applied to the nose during sleep.

2. Oral Appliances/Special Dental Splints

Several oral appliances are available and are effective in treating mild to moderate obstructive sleep apnoea.

a. Mandibular Advancement Splint

It looks similar to a sports mouth guard and is worn over the upper and lower teeth during sleep to push the lower jaw forward, opening up the airway at the back of the tongue. Adjustments may be necessary in the first few months.



An adult is fitted with an adjustable oral appliance with connectors at the side.



A Tap-T oral appliance with a connector in front.

b. Tongue Retaining Device

The device pulls and retains the tongue in a forward position to prevent the tongue from collapsing and obstructing the airway during sleep.



SURGICAL TREATMENTS

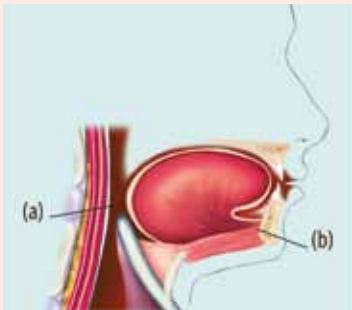
Surgery is sometimes recommended for severe obstructive apnoea. They include procedures to remove obstructions in the airway and expand

the airway, and the apnoeas and hypopnoeas may be greatly reduced or completely resolved. Patients must be assessed by sleep specialists to decide whether surgery is the preferred solution for them.

1. **Genioglossus advancement surgery** is surgery at the chin.

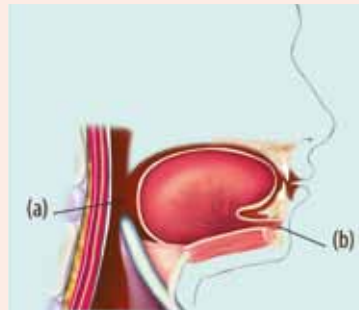
This pulls the tongue muscle forward and creates a larger airway between the back of the tongue and the throat. The tongue is also less likely to fall backwards, resulting in easier breathing during sleep.

BEFORE



- (a) Narrow airway at base of tongue.
- (b) Tongue tendon is attached to inner surface of lower jaw.

AFTER

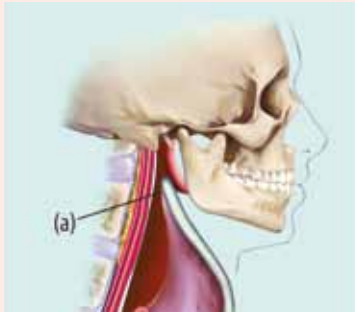


- (a) Airway is enlarged.
- (b) Bone with attached tongue tendon is pulled through the lower jaw.

2. Maxillomandibular advancement (MMA) is a more invasive surgical procedure that brings forward both the upper and lower jaws. This pulls on the soft tissues attached to the jaw bones, tightening up the lax tissue at the back of the nose, mouth and voice box.

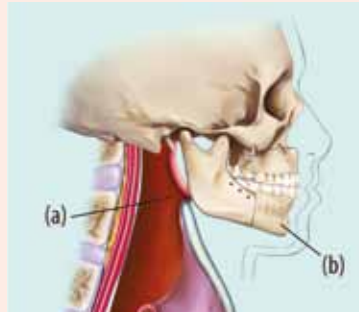
The airway also becomes bigger. The procedure is done using well-established orthognathic (jaw) surgery techniques. Long-term studies have shown a 90 percent success rate with this procedure.

BEFORE



(a) Narrow airway.

AFTER



(a) Airway is enlarged.
(b) Jaw is surgically moved forward.

Services Available at SingHealth Institutions

NATIONAL DENTAL CENTRE SINGAPORE



The National Dental Centre Singapore (NDCS) is the largest specialty referral centre for oral healthcare.

Our multidisciplinary team of specialists and trained support staff work closely to provide a high standard of care and safety, managing patients with complex dental, oro-facial and rehabilitative problems.

Patient care is delivered through three clinical departments: Oral and Maxillofacial Surgery, Orthodontics and Restorative Dentistry.

As a tertiary care centre, our education and research activities in oral health define tomorrow's dentistry, positively improving patients' lives.

CLINICAL DEPARTMENTS

Patient care services are delivered through three clinical departments. Our specialists work in multidisciplinary teams, managing patients with complex dental, oro-facial and rehabilitative problems.

DEPARTMENT OF ORAL AND MAXILLOFACIAL SURGERY

The Department of Oral and Maxillofacial Surgery provides a wide range of surgical services ranging from dentoalveolar surgery to orthognathic surgery and the management of jaw tumours. The department also handles patients with salivary gland and mucosal diseases as well as patients with facial pain and temporomandibular joint problems.

Scope of practice:

- Dentoalveolar surgery
- Implantology
- Orthognathic surgery
- Traumatology
- Tumour and cysts of the jaw
- Oral malignancies in collaboration with cancer specialists
- Mucosal diseases and salivary gland disorders, including laser treatment

- Oro-facial pain and temporomandibular joint disorders
- Oral and maxillofacial nerve injury repair
- Cleft lip and palate surgery
- Obstructive sleep apnoea
- Aesthetic facial surgery

Senior Consultants

CI Assoc Prof Poon Choy Yoke
 CI Assoc Prof Andrew Tay Ban Guan
 CI Assoc Prof Raymond Peck Hong Lian
 CI Assoc Prof Teh Luan Yook
 CI Assoc Prof Goh Bee Tin

Consultants

Dr Chelsia Sim Qiu Xia
 Dr Lai Juen Bin
 Dr Nattharee Chanchareonsook
 Dr Danny Tan Ben Poon
 Dr Soong Poh Luon

Associate Consultants

Dr William Lim Tian Wei
 Dr Rahul Harshad Nagadia

DEPARTMENT OF ORTHODONTICS

The treatment aims of the Department of Orthodontics are to improve occlusion and facial aesthetics and to correct malaligned teeth. The department handles the full range of malocclusions and oro-facial deformities.

Scope of practice:

- Orthodontic treatment with conventional fixed and removable appliances
- Orthodontic treatment with aesthetic appliances (ceramic bracket systems, lingual orthodontics and Invisalign)
- Interceptive orthodontic treatments, including dento-facial orthopaedics
- Management of dento-facial deformities:
 - Combined orthodontic-orthognathic surgical treatment
 - Management of cleft lip and palate patients
 - Management of obstructive sleep apnoea/snoring patients

Senior Consultants

Dr Lim Kuen Fui
 CI Assoc Prof Chew Ming Tak
 CI Assoc Prof Mimi Yow
 Dr Johanna Choo

Consultants

Dr Elaine Tan Li Yen
 Dr Rosalind Wong Yoke Cheng

DEPARTMENT OF RESTORATIVE DENTISTRY

Endodontic Unit

Endodontic treatment conserves teeth that will otherwise have to be extracted. It is concerned with the aetiology, diagnosis, prevention and treatment of diseases and injuries to the dental pulp and associated peri-radicular conditions.

Scope of practice:

- Endodontic treatment using microscopy
- Management of pulpal and periapical diseases
- Non-vital pulp therapy/ conventional root canal treatment
- Vital pulp therapy
- Surgical endodontic treatment
- Management of endodontic complications and mishaps
- Management of trauma to the tooth
- Non-vital bleaching
- Restoration of endodontically-treated teeth

Senior Consultants

Dr Lui Jeen Nee

CI Assoc Prof Chen Nah Nah

Consultant

Dr Lim Sor Kheng

Paediatric Dentistry Unit

The unit provides a comprehensive range of dental services for patients from infancy to adolescence, as well as children with special healthcare needs.

In a child-friendly environment, the unit embraces the philosophy that dental care must start early, and much emphasis is given to training the child towards becoming a good dental patient with good habits to last into adulthood.

Scope of practice:

- Therapeutic and preventive services for decay, malocclusion and gum diseases
- Dental care of children with specific needs
- Infant Oral Health Clinic
- Paediatric dental services under general anaesthesia

Senior Consultant

Dr Tan Wee Kiat

Consultant

Dr Bien Lai Wen Pui

Associate Consultant

Dr Md Badrun Nafis Bin Saion

Periodontic Unit

Periodontics is the comprehensive management of diseases or conditions affecting the gum and supporting tissues. The unit's therapeutic objectives are to control and eliminate disease, maintain health and restore form, function and aesthetics to supporting tissues around teeth or dental implants. Treatment modalities encompass surgical and non-surgical therapy.

Scope of practice:

- Open flap debridement with or without osseous surgery
- Crown-lengthening procedures
- Soft tissue grafting
- Root resection
- Root augmentation
- Regenerative procedures
- Aesthetic periodontal surgery
- Implant and peri-implant surgery procedures

Senior Consultants

Dr Koh Chu Guan
CI Assoc Prof Ong Meng Ann, Marianne

Consultants

Dr Chee Hoe Kit
Dr Tan Ching Ching

Associate Consultant

Dr Lee Wan Zhen

Prosthodontic Unit

Prosthodontic treatment involves the restoration of natural teeth or replacement of missing teeth with artificial substitutes. Maxillofacial prosthodontics, oral-facial pain and temporomandibular joint disorder management are other areas of special interest within the Unit.

Scope of practice:

- Crowns, bridges, dentures
- Implant prosthodontics
- Teeth whitening
- Veneers and laminates
- Maxillofacial prosthodontics
- Temporomandibular and oro-facial pain therapy

Senior Consultants

CI Assoc Prof Teoh Khim Hean
CI Assoc Prof Chua Ee Kiam
CI Assoc Prof Sim Poh Choo, Christina
Dr Tan Ken
Dr Yuen Kwong Wing

Consultants

Dr Quek Heng Chuan
Dr See Toh Yoong Liang

MULTIDISCIPLINARY SERVICES

Multidisciplinary management of patients with complex oral needs has been core to our clinical practice. Care is optimised and delivered at a single location, creating convenience for patients and allowing for informed interprofessional decision-making during treatment.

Multidisciplinary services include:

CORRECTIVE JAW SURGERY

We have the most comprehensive and experienced team to manage patients with dento-facial deformities and malocclusions who need jaw surgery.

Orthognathic Surgery Clinic:

Orthognathic surgery has been offered as part of the Centre's comprehensive range of oral conditions which may benefit from orthognathic surgery include:

- Maxillary and/or mandibular facial skeletal deformities associated with masticatory malocclusion
- Facial skeletal discrepancies associated with sleep apnoea,

airway defects, soft tissue discrepancies

- Temporomandibular joint pathology

Cleft Lip and Palate Clinic:

This clinic manages selected types of cleft lip and palate deformities from treating the cleft lip and palate to managing the associated dental conditions.

Obstructive Sleep Apnoea (OSA) and Snoring Clinic:

We are partners of specialist sleep teams of Singapore General Hospital and Changi General Hospital and we work together to evaluate, educate and treat patients with such conditions. Multidisciplinary appointments and referrals are coordinated through our OSA Clinic coordinators.

MAXILLOFACIAL REHABILITATION

Oral and Craniofacial Implant Clinic:

We bring together specialists from various dental and medical disciplines for joint management of complex oral implant cases as well as cases requiring implant-supported craniofacial

prostheses for congenital deformities or following tumour resection or trauma. Our collaborating partners include the National Cancer Centre Singapore and Singapore National Eye Centre.

Prosthetics, Speech and Swallowing (PSSR) Clinic:

The PSSR Clinic aims to provide a comprehensive approach to managing patients with motor speech and swallowing disorders. Oral rehabilitation for patients with compromised oral functions is managed through combined clinics and specialised clinics.

Collaborating with speech and language therapists from the Singapore General Hospital, we provide prosthetic intervention where necessary. The Clinic attends to patients with compromised oral functions due to the effects of head and neck cancer post-surgical resection, radiotherapy and cerebral vascular disorders.

AESTHETIC DENTISTRY

Our aesthetic team improves dento-facial aesthetics through services ranging from teeth whitening, corrections of minor occlusions with porcelain veneers, improving facial contours (masseteric hypertrophy) with botulinum injections, to full range of orthodontics with or without orthognathic surgery. In cases of anterior prostheses such as implants or crowns, our specialists can create a more natural-looking appearance through gum contouring and periodontal surgery.

For enquiries, please contact:

Tel: 6324 8802

Email: appointment@ndcs.com.sg

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KK WOMEN'S AND CHILDREN'S HOSPITAL



DENTAL SERVICE

The KKH Dental Service team is dedicated to optimising the oral health and dento-facial aesthetics of our patients, helping to create great smiles! We provide a comprehensive range of dental services catering to patients from infancy to adulthood.

PAEDIATRIC DENTISTRY

Paediatric dentistry is an age-defined specialty that provides both preventive and therapeutic dental care for infants, children and adolescents. Prevention is better than cure, hence we strongly advocate that a child's first dental visit should occur by age one, so that we can offer personalised

recommendations and help in developing good oral habits, to prevent dental problems and build a cavity-free smile.

We also offer dental services for sick and special children and adolescents, which may prevent them from obtaining dental care elsewhere.

Range of services:

- Preventive services
 - Oral health education
 - Fluoride applications
 - Remineralising therapies
 - Fissure sealants
- Therapeutic services
 - Scaling
 - Fillings, dental pulp treatments, stainless steel crowns, extractions
 - Interceptive orthodontics
 - Treatment under general anaesthesia
 - Management of children with special medical, developmental needs
 - Management of acute dental infections
 - Management of children with cleft lip and palate or other craniofacial conditions

- Trauma management
 - Emergency management of fractured or displaced primary or permanent teeth

ORTHODONTICS

Orthodontics (or what we know as 'braces') is the specialty involved in the diagnosis, prevention and correction of dental or facial irregularities (otherwise termed 'malocclusions'). Re-aligning the teeth (and in selected cases the jaws as well), creates a beautiful smile that not only improves self-esteem, but has a positive influence on dental health and tooth function. We offer various types of braces, including new technologies, which can move teeth with less discomfort, greater speed and better aesthetics.

Our orthodontic team also collaborates closely with our medical colleagues in the multidisciplinary management of children and adolescents with oro-facial conditions such as cleft lip and palate and sleep apnoea.

Range of services:

- Monitoring of developing jaw growth and tooth alignment
- Interceptive orthodontics with removable or fixed appliances
- Fixed and removable appliances
- Orthodontic-orthognathic management of malocclusions
- Multidisciplinary management of cleft lip and palate
- Multidisciplinary management of other dento-facial deformities

ORAL AND MAXILLOFACIAL SURGERY

Oral and Maxillofacial Surgery is the specialty which combines surgical training with dental expertise for the treatment of diseases, injuries, tumours, and deformities of the face and jaws. Oral surgical procedures include wisdom teeth surgery, dental extractions for medically compromised patients, placement of dental implants, aesthetic and functional jaw surgery and diagnosis and treatment of jaw cysts and tumours.

Range of services:

- Wisdom tooth surgery
- Removal of impacted teeth
- Exposure of unerupted teeth
- Orthognathic surgery
- Maxillofacial trauma
- Management of cysts and tumours of the jaw
- Implant surgery
- Temporomandibular disorders and oro-facial pain

PROSTHODONTICS

Prosthodontics is the specialty involved in the restoration and replacement of teeth. Our prosthodontist helps make smiles beautiful by restoring or replacing the teeth, helping you smile with confidence and function better. We also collaborate closely with other dental specialties to manage the complex needs of patients with missing or malformed teeth.

Range of services:

- Crowns, bridges, dentures
- Implants
- Veneers
- Tooth whitening
- Maxillofacial prosthodontics
- Temporomandibular and oro-facial pain therapy

Orthodontics

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Senior Consultant and Head

Dr Narayan H Gandedkar
Dental Officer Specialist –
Clinical Researcher

Paediatric Dentistry

Dr Chay Pui Ling
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