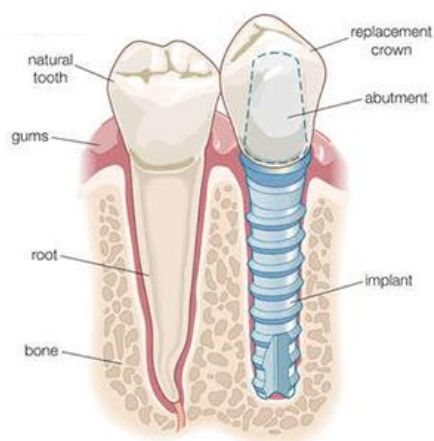


DENTAL IMPLANTS

Dental implants are artificial tooth roots that are inserted into the jawbone to replace missing natural teeth. Implants and their attached crowns closely mimic the look and function of real teeth. They can make an attractive alternative to dentures and bridges.

Dental implant techniques can replace one or several missing teeth. In some cases, an entire set of artificial teeth can be carried on dental implants.

As shown in the illustration, a dental implant is the metal "root" (implant) that is inserted into the jawbone. The artificial tooth (crown) is attached to the implant by use of an abutment (see page 3). In some cases, instead of an artificial tooth, an implant can be fitted with special clips or attachments (similar to press-studs) to hold a denture. The studs will minimise movement of the denture.



The implant works like a natural tooth root. It bonds with bone and anchors the artificial tooth into the jaw. Implants can be applied in a variety of ways to solve problems with missing teeth.

Dental implants:

- help to withstand greater bite pressures with dentures
- prevent bone loss in the jaw (this may reduce the risk of adjacent natural teeth becoming loose)
- prevent the formation of hollowed or collapsed cheeks that can occur after tooth extraction (missing teeth cause bone loss in the jaw)
- are usually surrounded by gum tissue like natural teeth
- may prevent gum recession
- unlike bridges, do not require the cutting and reshaping of neighbouring healthy teeth
- are firmly secured in the jaws
- are usually more comfortable than dentures
- usually do not require separate care routines or special cleaning products, as with dentures or bridges
- like natural teeth, are cleaned by dental floss and brushing with regular toothpaste.

A dental implant is designed to last for many years, but poor oral hygiene can shorten its lifespan. Good oral hygiene is crucial.

Like real teeth, artificial teeth that are not regularly brushed and flossed can develop deposits (plaque and calculus) that eventually lead to dental problems such as bleeding gums, loss of bone, infection and pain.

Properly maintained implants that are anchored by sufficient bone can last for many years, although repairs may be expected like any other dental appliance.

In order to achieve a good outcome, a patient's case may need to be managed by several practitioners.

While this can affect the length of treatment and costs, it is done in the interests of the patient's well-being.

Before surgery

You and your dentist will need to discuss whether dental implants are the best treatment for your dental problem. After talking with your dentist and reviewing the information, you may decide not to go ahead with the treatment. The decision is yours, so do not feel obligated. If you decide to opt for dental implants, the dentist will need to make sure you are a suitable candidate for the procedure. While most people can have dental implants, exceptions include:

Age - children younger than 17 years are usually not considered suitable because their bones are still growing. Otherwise, age is generally not a restriction.

Bone loss - a patient who lacks sufficient jawbone may not be suitable for implants. In many patients, bone replacement techniques can be used to rebuild enough bone for an implant site.

Smoking - smoking impairs healing and may cause implant failure by preventing the implant from integrating with the bone. Over time, smoking may cause a breakdown in the integration between the implant and the bone.

Pregnancy - general anaesthesia (if needed) and other medications may risk the unborn baby's health in some cases.

Certain medical conditions - illnesses such as uncontrolled diabetes increase the risk of complications, including infection and delayed healing around implants.

Alcohol or drug abuse - the patient may have dietary problems, be unable to follow the dentist's instructions, or fail to maintain proper oral hygiene.

Psychological illness - the patient may not be able to follow the dentist's instructions.

Your medical and dental history

Tell the dentist your full medical and dental history. The success of the dental implant and your recovery after the procedure can be influenced by the medications you take, and any major illnesses or surgeries you may have had. In particular, tell your dentist if you have had:

- haemophilia or any other kind of blood disorder
- heavy bleeding when injured or following surgery
- rheumatic fever
- heart problems or heart surgery
- facial radiotherapy
- any medicines on a regular or occasional basis, especially aspirin, warfarin or other "blood-thinning" medication
- a reaction to an anaesthetics drug
- an allergy to antibiotics or other medicines.

Give your dentist a list of all medicines you are taking or have recently taken, including prescription drugs, over-the-counter medicines and herbal remedies.

Diagnostic tests

Your dentist will need to perform diagnostic tests to confirm that you are suitable for the procedure, and to help plan the best treatment approach. These tests may include:

- dental examination
- photographs
- dental X-ray radiographs
- CT scans of your jawbones
- dental casts of your mouth

Decisions on the size, shape and appearance of your artificial tooth are based on the teeth that remain in your mouth. It is at this stage that you should discuss with your dentist any concerns or suggestions about the look of your artificial tooth.

Treatment for other dental health problems

Dental health problems usually need to be corrected before implant treatment. People who decide to have a dental implant may have dental health problems such as decay or gum disease that contributed to the loss of their natural teeth.

These problems need to be diagnosed and treated to ensure the ongoing success of the implant following the procedure. You need to talk with your dentist about the best treatment plan for your particular dental health problems and the expected costs.

You may damage your dental implants and crowns if you habitually grind your teeth (bruxism). Evidence of bruxism includes flattened teeth, chipped tooth enamel and broken fillings. To allow for the extra loading on the implants, the dentist may:

- plan to insert extra implants
- make the artificial teeth out of stronger materials
- fit you with a special type of guard or splint to wear at night, since many people who grind their teeth do so in their sleep.

Realistic expectations

Not all dental implant procedures produce "life-like" results. Some restorations are challenging, and the result may be less satisfying than you imagined. Discuss your expectations with your dentist and make sure you have a realistic understanding of the procedure's benefits and limitations.

Do not expect crowns and implants to look and feel exactly like your own teeth. Biting and chewing will feel different, and it may take time to get used to the new sensations. While well-maintained dental implants are considered to be virtually permanent, you should anticipate regular dental check-ups and maintenance to keep your artificial teeth in good repair.

Your dentist cannot guarantee that the implant surgery will be successful. A dental implant may have to be replaced. About one implant in every 20 fails to integrate with the bone or comes loose over time. The factors that contribute to implant failure include:

- the bone's density and strength
- the location of the implant (the most difficult location is the back of the upper jaw where the bone has less height and density than in other areas)
- the patient's general health, including the ability to heal after surgery
- patient's commitment to oral hygiene
- smoking.

Talk to the dentist about an alternative treatment if your implant should fail.

Anaesthesia

Dental implant procedures can be performed using local anaesthetic or general anaesthesia, depending on the complexity of the procedure or whether the patient is uncomfortable with the idea of being awake during surgery. General anaesthesia may require hospital admission and the services of a specialist anaesthetist.

Modern anaesthetics have minimal risks, but a few people may have a serious reaction to them. The anaesthetist can explain more about the type of anaesthetic that is best for you and the associated benefits and risks. You may be required to stop eating and drinking for a certain length of time prior to the procedure, depending on the type of anaesthetic to be used. The dentist and anaesthetist will give you detailed pre-operative instructions. Be sure to strictly follow these instructions.

Dental Implant Procedures

Different types of implants are available. Most implants are made from materials such as titanium that are capable of forming a strong integration with the surrounding bone tissue. The implant chosen for you by the dentist may not resemble the implant pictured in this pamphlet.

In most cases, the dental implant procedure involves three separate treatment stages:

- insertion of the implant into the bone
- insertion of the abutment (or connector) on the implant
- attachment of the artificial tooth (crown) to the abutment or connector.

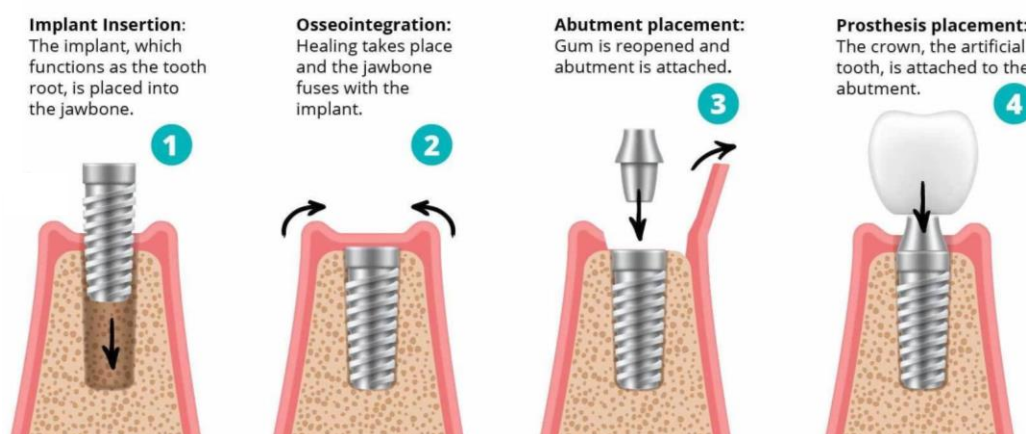
The overall implant process can take considerable time. The procedure can take from three to six months or more from surgical placement of the implant to the fitting of the crown.

This depends on factors such as your general and dental health, the amount of bone, rate of healing, degree of integration between the implant and the bone, and the extent of any other dental problems

In some cases, the dentist may insert the implant and affix both the abutment and an artificial tooth during a single operation. However, not every patient is suitable for, and not all dentists offer, this single-stage procedure.

The insertion of the implant can be performed at the dentist's clinic, at a day-surgery centre, or in hospital. The dentist will advise which setting is the most appropriate for you.

Depending on the complexity, the procedure can take from 30 minutes to several hours.



Preparation of the implant hole

The dentist prepares a site in the gum to expose the underlying bone. A drill prepares a hole in the jawbone to accept the implant. When several missing teeth are being replaced, the number of implants possible depends on the amount of bone available at each site.

It is not always necessary to insert one implant per missing tooth because a single implant can support a "bridge" of artificial teeth. Your dentist will tell you how many implants are required.

Insertion of the implants

The implant is cylindrical and its surface is either threaded or smooth. A threaded implant is screwed into the drilled hole. A smooth-sided implant is gently tapped into position. The gum is stitched closed, and the stitches are removed seven to 10 days later. Implant stability improves over the weeks and months as bone tissue grows on the surface of the implant. This process is called "osseointegration" or "biointegration". The dentist may allow up to six months for your bone to integrate with the implant.

Insertion of abutment (connector)

The abutment is fitted after the bone has healed around the implant. The abutment is the support post or connector between the implant and the crown. The dentist makes an incision into the gum to access the implant and affixes the abutment to the implant. Radiographs (X-ray films) are used to ensure the abutment is correctly placed. A dental impression of your mouth may be taken to finalise the design of the artificial tooth (or teeth). The dentist may allow a few weeks for the gum to heal.

Attachment of the artificial tooth

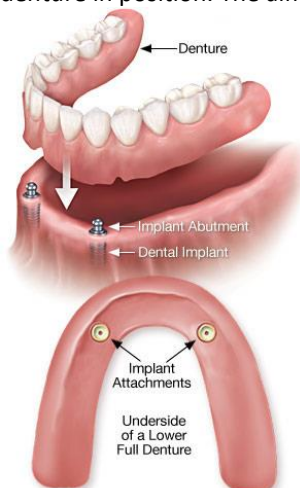
The dentist checks that the implant is strong enough to support the forces exerted by the artificial tooth. If so, the tooth is attached. The artificial tooth may be cemented onto the abutment or fixed to the abutment with a screw that can only be removed by your dentist, or you may opt for detachable teeth that you can remove yourself.

Detachable teeth, known as "over-dentures", are not as sturdy as non-removable teeth but are easy to clean thoroughly and repair. In some people, they may feel more comfortable. The dentist can advise which option is best for you.

Once the artificial tooth is fitted, a dental X-ray radiograph may be taken to ensure the correct placement of all implant components.

Dentures

Instead of an artificial tooth, an implant can be fitted with special clips or attachments that firmly hold an existing denture in position. The aim is to improve the stability of the denture. Most patients report good results.



Recovery after implant surgery

- Arrange for a relative or friend to drive you home.
- Some people take a few days off work.
- Do not drive, operate heavy machinery or exercise vigorously for a few days, unless your dentist advises that such activities are allowed in your case.
- Swelling, bruising, mouth pain and headache are normal reactions that may occur and usually resolve within one week. Ice packs used immediately after surgery may reduce swelling and pain. An over-the-counter medication should help ease discomfort. If not, your dentist can prescribe stronger medication.
- Your dentist may prescribe a course of antibiotics. If so, take them as directed.
- Drink plenty of water from two to three hours after surgery (not hot drinks).
- Avoid alcohol, especially if you are taking medications.
- Avoid hard or crunchy foods while your mouth is healing. Choose soft foods such as vegetable soups. Your dentist may advise you to eat a soft-food diet for up to six weeks.
- The dentist may ask you to perform self-care routines at home, such as rinsing your mouth with salty water or antiseptic solutions. Follow all self-care instructions as directed.
- Follow-up appointments and regular dental check-ups ensure the ongoing success of your implant treatment. Be sure to visit your dentist regularly.
- See your dentist at once if your pain or swelling worsens, or if you develop a fever.
- Good oral hygiene is important. Follow your dentist's instructions.

Caring for your dental implants

Bacteria in the mouth form a sticky coating called plaque that adheres to both natural and artificial teeth. Your implant-supported teeth may fail if you do not keep them clean because plaque can lead to gum inflammation (gingivitis) and infection. Be guided by your dentist. General suggestions on caring for your dental implants and natural teeth include the following:

- Brush your teeth after every meal.
- Take your time. Clean every surface of each tooth.
- Use fluoride toothpaste to reduce the risk of decay in your natural teeth.
- Use a toothbrush with a small head and soft bristles, and interdental brushes.
- A toothbrush cannot reach between teeth or below the gum line. Floss your teeth with dental floss at least once daily.
- Do not smoke because smoking impairs healing and increases the risk of implant failure.
- Sugary foods encourage the build-up of plaque. Limit your intake of sweet foods and drinks. Brush your teeth after having a sugary snack.
- See your dentist at once if you have a toothache, gum inflammation or any other dental problem.

Possible complications of dental implant treatment

Dental implant surgery, like all types of surgical procedures, carries some degree of risk.

It is not usual for a dentist to outline every possible rare complication of treatment. However, it is important that you have enough information about side effects and complications to fully weigh up the risks and benefits of treatment.

If you have particular concerns about possible complications, discuss them with your dentist. You may find it helpful to prepare a written list of issues and questions.

The following risks are listed to inform you, not to alarm you. There may be other risks that are not listed.

General surgical risks

- allergic reaction to the anaesthetic
- short-term nausea following general
- very rarely, excessive bleeding from the wound that may be life-threatening and require a blood transfusion
- infection of the wound that may require antibiotics.

Specific risks of implant surgery

Affected sinus - the sinuses are air-filled cavities within the skull. An implant inserted into the upper jaw may contact or perforate the lining of the sinus within the bone (maxillary sinus) and cause infection (sinusitis). Antibiotics are typically used to treat the infection. Excessive bleeding from an affected sinus is rare.

Fractured lower jaw - rarely, the lower jaw may break during the procedure. Specialist treatment may be needed.

Damaged nerve - the inferior dental nerve runs the length of the lower jaw. Placement of an implant can damage this nerve and cause numbness in the gums, lips, or in the skin around the mouth. In most cases, the numbness is temporary and resolves within six to 18 months. In some cases, the numbness is permanent.

Inhaling or swallowing equipment or parts - the patient may inhale or swallow the implant, attachments or a piece of equipment that is used to place the implant. This can cause a range of complications such as breathing obstruction or infection. Surgery may be needed to remove the object.

Specific risks of implant treatment

Speech problems - some patients have speech problems following the fitting of the artificial tooth or teeth. This usually resolves once the patient gets used to the altered feel of the mouth. If not, speech therapy may be recommended.

Gum tissue overgrowth (hyperplasia) - the gum surrounding the implant may enlarge and push above the gum line, causing redness and pain. The overgrowth of gum tissue may be reversed with good oral hygiene or can be surgically removed.

Local infection - the area around the implant may become infected. If the infection does not respond to antibiotics, the dentist may have to remove the implant.

Systemic infection - in certain people, implants can lead to infection in areas other than the implant site. Infectious endocarditis is a potentially life-threatening infection of the heart. People who have undergone prior heart surgery are most at risk of this rare complication.

Bone loss - in most cases, the pressure of biting and chewing encourages strong bone tissue to grow around the implant. In rare cases, the implant causes bone loss, and the implant eventually becomes unstable.

Loose implant - the implant may fail to integrate with the bone, or it may become unstable with time. The implant must be removed and another inserted into the jaw bone nearby. Alternatively, the bone is given time to heal and another implant is inserted into the original site.

Loose tooth - the artificial tooth may come loose from the abutment, or the abutment may come loose from the implant. Either case requires treatment to tighten or replace screws.

Tooth problems - such as chipping or breakage. In some cases, a new artificial tooth must be created and fitted.