**General information about dental implants**

**What is a dental implant?**

A dental implant is effectively a substitute for a natural tooth root. They are made of titanium or titanium alloys, materials which are extremely strong and biocompatible to the body. They look like cylinders or screws and are placed in the jaw bone to replace missing teeth. Over a period of time, bone attaches to the surface of the implant which becomes part of the body. The terms “osseointegrated implants” and “endosseous implants” are used to describe dental implants that can establish close contact with bone. Replacement teeth called crowns are later attached to implants. Dental implants look and function like natural teeth.

There are different implant systems available and they all can provide successful results. Some practitioners have preferences to use a particular system as they have experience and confidence in using that implant system. Some systems cost more than others. We use one of the renowned systems called Straumann implant system.

**What are components of an implant?**

The main component is the titanium implant itself. This resembles a screw with a specially roughened surface which makes it very compatible with bone. The implant is about the same size as the root of a natural tooth. It is placed into the bone and left to integrate for a few weeks. Once the implant is solid in the bone, the second part, a special titanium post, can be screwed into the implant. This is called the abutment. The abutment allows the fixation of the final part of the implant – the crown. The crown is usually screwed into place or it can be cemented. The porcelain on the crown is custom made to match the colour of the rest of your teeth.

**What can implants be used for?**

* Dental implants are an ideal solution for a single missing tooth. They eliminate the need for drilling adjacent natural teeth as would be the case for a bridge.



 *Dental Implant Conventional bridge*

* Dental implants can be used to replace multiple missing teeth. Large spaces due to several missing teeth do not necessarily require one implant per tooth as implant supported bridges can be made and occasionally, it is even possible to join natural teeth to implants with a bridge. The number of implants required for missing teeth space depends on the quality and quantity of bone. In the upper jaw, bone quality is poorer than in the lower jaw so generally patients need more implants in the upper jaw as compared to the lower to replace multiple missing teeth.



 *Implant-supported partial bridge*

* Implants can eliminate the need for adhesives to retain loose dentures. It is possible to replace a complete denture either with implant-supported overdentures or full fixed bridges.



 *Implant-retained overdenture Implant-supported fixed full bridge*

**What are the advantages of dental implants?**

1. Dental implants can improve your quality of life. They can give you confidence and improve your general wellbeing. They may help to rebuild your self-esteem enabling you to smile with confidence.
2. Dental implants look like natural teeth so restore your aesthetics.
3. They can help to maintain your speech.
4. Dental implants help to preserve the jawbone and maintain facial features.
5. They provide long-term solution for lost teeth.
6. They eliminate discomfort caused by loose dentures.

**Who is suitable for dental implants?**

If for any reason you have missing one or more teeth, you can be considered for implant treatment. Generally speaking, if you have good health, implants will almost certainly work for you. Age is certainly not a limiting factor, although it is inadvisable to place implants in young growing individuals. There are very few cases where implants could not be provided. With availability of advanced bone grafting procedures, lack of enough bone does not mean that you can’t have implants. However, smoking does have a detrimental effect in progression of the gum disease which can affect implants as well. Smokers are slightly more likely to develop problems with initial healing and the health of gums and bone around implants can be affected. Dental implants are not always the best treatment for missing teeth; however, it is most suitable in the majority of cases.

**What are alternatives to dental implants?**

If you have a missing single tooth at the back of your mouth, you can probably leave the space alone, however, over the passage of time you may lose the space as adjacent teeth may tilt and the opposing tooth may overgrow to fill the space. Missing teeth can be replaced with a removable denture which gets support from gums and remaining natural teeth. This is relatively less expensive but not many patients tolerate it easily. The other alternative is a conventional or adhesive bridge where adjacent teeth are capped or the bridge wings are attached to adjacent natural teeth.

**How long will implants last?**

Several scientific studies done in different countries over 20 years show promising results with more than 95% of implants being successful. Just like natural teeth, implants need maintenance and well maintained implants can be expected to last several years and possibly for a lifetime. Gum disease can affect implants in the same way as natural teeth and can lead to loss of supporting bone. To maintain the health of gums and bone around implants, you will be required to visit a hygienist regularly for cleaning and home care to maintain good oral hygiene is important.

**How is it done?**

Implant placement is a precise and delicate technique which is carried out under sterile conditions. It usually involves the following steps:

1. Implant placement: Implant is surgically placed under the gum in the jawbone which is usually done under local anaesthesia. Some patients who consider themselves anxious patients may benefit from sedation. A small healing cap or screw is inserted into the implant to prevent any debris from entering. The implant is then covered and secured with gum. Stitches are normally removed in 7-10 days of implant insertion. Implant is then left for a few weeks so it can attach to the bone, a process called ‘osseointegration’. You may experience some discomfort and swelling which may last for up to a week.
2. Uncovering: Implant is uncovered and a titanium post is screwed into the implant. A temporary crown is attached to the post and the gum tissue is allowed to heal around the post.
3. Crown Fit: A final crown is made and attached to the post. This crown is custom made to match your own natural teeth with respect to size, shape and shade.

**Does implant treatment hurt?**

Most patients experience very little discomfort after implant surgery. The majority of patients describe it as a lot less than experienced at the time of extraction of the tooth. It can usually be managed with simple painkillers for a few days.

**How long does treatment take?**

The total treatment time required will vary with the degree of difficulty and the amount of work needed. It is important to bear in mind that the implant components and crown/ teeth have to be made individually to suit your specific requirements and mouth. This type of precision work is very time consuming and cannot be rushed, as it must be of the highest quality. Prior to fitting the finished teeth a variable number of visits may be necessary to make fine adjustments to the teeth. Therefore, it is important to keep your dentist informed of any travel arrangements or important engagements you may be planning and to give as much notice as possible.

For simple straightforward cases, time from placement of implant to fitting crown may vary from 6 weeks to six months. However, for advanced and complex cases where quality of bone is poor, it may take longer to complete the treatment as bone grafting procedures will be required. It is always advisable to give more time for implants to osseointegrate where bone quality and volume are not very good.

**What should you know before you start treatment?**

It is important that you should be given a written summary of your treatment planning highlighting your current dental situation and any alternatives there are to dental implants. This summary should also include an overview of the anticipated treatment stages and give you some idea of how long treatment is likely to take, how many implants are required and what the cost will be. You should be made aware of the risks involved including chances of implant failure and strategy in case of failure.

**Do you have enough bone for implant placement?**

This is assessed by clinical and radiographic examination. Routine dental x-rays provide enough information about quality and volume of bone but only in two dimensions. It is usually possible to plan for implants in simple cases but for more complicated cases more advanced cone beam CT scan may be required to further evaluate bone before implant treatment.

**What can be done if you do not have enough bone?**

If a patient does not have enough bone to secure implant, bone can be added to potential implant site by borrowing from some other part of the body. The most common intra-oral sites for taking bone are the chin and back part of the lower jaw. The grafted bone is secured with screws in the deficient area and left for a few months to heal. Later, after maturation of the bone has occurred, the screws are removed and implants are placed in the new bone. There are other sources of bone specially prepared to use in humans. These materials act as a scaffold into which new bone can grow. Bone grafting may significantly increase the length of time required to complete the treatment.

**What anatomical structures must be avoided during implant placement?**

In the upper jaw, if back teeth are being replaced then maxillary sinus can be in close proximity. This can easily be located on routine x-rays.

In the lower jaw, the most important anatomical structure to be avoided is ‘inferior dental nerve’. This nerve runs from behind the wisdom tooth all the way through the whole length of the lower jaw and emerges at the premolar teeth region to give sensation to lower lip and chin areas. If the nerve is damaged during implant placement, it can lead to temporary or permanent numbness of lip and chin of the affected side. It is a rare but important complication.

**Can dental implants be placed next to natural teeth?**

Dental implants can safely be placed next to natural teeth. However, it may be difficult if the natural tooth root is curved or tilted unfavourably. This can usually be identified and avoided preoperatively at the planning stage.

**Can you use your denture during implant treatment?**

It is usually advised not to wear a denture in the first week of implant placement. Thereafter, denture can be used after some adjustment so it does not put any undue pressure on the implant and associated healing tissues. A temporary removable bridge can be made and used as an alternative to a denture.

**Is there any help available for anxious patients?**

If you consider yourself a nervous patient and think that you cannot cope with implant treatment under local anaesthetics, there are several ways to help to have treatment in a relaxed state:

Oral sedation - A simple way to aid relaxation is to be given a dose of a short-acting medication such as Temazepam. This will reduce anxiety for most patients and provides a very good effect for simple surgical stages taking less than an hour.

Conscious sedation - For treatment of greater complexity it may be suggested that you have a more controlled way of keeping relaxed and comfortable during the surgical stages. This is distinctly different from a general anaesthetic, because you remain alert enough to respond to simple instructions which may be helpful to the surgeon, however, you will remember almost nothing about the treatment.

**How much does treatment cost?**

The fees for the treatment can vary depending on the complexity of the case, number of implants required, type of crown chosen, whether a temporary restoration is required or not and whether a bone grafting procedure is required or not. A detailed personalised written estimate will be provided before commencing the treatment.

**What may cause implant failure?**

Implants may fail to take but fortunately this is rare. There are no absolute reasons to preclude implants but many studies show that smoking significantly increases the risk of implant failure. It is always advisable to stop smoking before commencing implant treatment. Fortunately stopping reverses the situation and improves success rate. Should an implant fail to take, it is usually possible to replace it either at the same time as the failed implant is removed or as a separate procedure.

[**How often will I need to have my dental implants checked?**](http://www.thedentalimplantclinic.com/dentalimplants.htm)

It is essential that you continue to see your own dentist and hygienist for regular check-ups. Clinical studies have shown that a yearly review with your implantologist is best for the longevity of your implants

**WHY ARE IMPLANTS NEEDED?**

Once teeth are lost, the bone in which they are embedded gradually disappears because it is no longer required to support the teeth. The teeth and lost bone are traditionally replaced by removable dentures or fixed bridges to restore appearance, speech and mastication.

As with all manmade substitutes for nature’s living tissues, there are drawbacks to artificial appliances. Dentures reduce masticatory efficiency and can suffer from poor retention. They frequently cause problems where they overlie the gum margins leading to swollen tender or bleeding gums. Dentures need to be removed overnight.

On the other hand, fixed treatment options include conventional bridges, which involve cutting away healthy teeth in order to provide support for the false teeth.

Adhesive bridges are false teeth supported by metal wings glued onto adjacent teeth. They often suffer from recurrent failure/ debonding causing them to fall off from time to time.

An increasingly popular alternative method of fixed tooth replacement is dental implants. These are artificial replacements for the roots of the lost teeth. They can be placed into the jawbone and used to support the false tooth or teeth.

Following placement implants become firmly attached or integrated with the bone and act in a similar manner to a tooth root.

If an implant is placed immediately or soon after a tooth is extracted, jawbone is preserved and its further loss prevented. For this reason it is best not to delay the decision to place implants, as bone will be lost with time which can make the placement of implants more difficult.

Even after considerable bone loss has occurred, or even if teeth have been missing for many years, it may still be possible to place implants. However additional procedures involving bone grafting techniques may be required.

**THE PROCEDURE**

The condition of the jaws will be assessed for suitability and the treatment planned using X-ray films, photographs and models of the teeth. It may be necessary to take a Jaw Scan (CT) type X-ray to check the amount and position of the available bone.

The final decision whether or not to proceed with implant placement will be made at the time of surgery and will be determined by the quality and quantity of the bone found at the intended implant site.

An important nerve runs in the lower jaw that supplies sensation to the lower lip and skin of the chin. Obviously the X-ray is important in determining the position of this nerve avoiding the slight possibility of injury, which could result in altered sensation.

In the upper jaw it is important to ascertain the size and position of the air sinuses (maxillary sinuses) and nasal cavities prior to implant insertion. Occasionally the implants may have to be placed slightly into the sinus or nasal cavity. Usually this is not noticeable but there may be a slight nasal discharge with a small amount of temporary bleeding.

The implant/s will be placed within the bone under the gum, which will be stitched, so following placement the implant/s should not be visible in the mouth.

### **TYPES OF IMPLANT PLACEMENT**

Implant placement can be managed in a few different ways:

1. Immediate insertion is when the dental implant is placed at the same time that the tooth or teeth are removed. The advantages of this approach are a reduction in treatment time and bone preservation.

Whether or not this is possible will depend on the condition of your tooth/ teeth and the surrounding bone at the time of extraction.

If infection is present it may be necessary to defer implant placement for up to three months while new healthy bone reforms in the area.

1. Late dental implant placement is insertion of the implant into a region of the mouth where the tooth or teeth have previously been removed or have been missing for some time.
2. Transmucosal implant placement involved inserting the implant and fitting an attachment on top of it. This attachment is visible in the mouth following insertion and allows the gum to heal around it.

If the maxillary sinus is very close to the area of surgery, we may need to increase the height of bone for implant placement by elevating the floor of the sinus. This is done by two methods.

The first method is to elevate the floor of sinus through the hole which is prepared for implant placement. The second method is more extensive and a window is made in the front wall of the sinus, through the window bone graft is laid in the floor of the sinus and the height of bone is achieved

The possible complications of these sinus lift procedures include bleeding through the nose, sinus infection and failure of graft and implant. This may result is chronic sinusitis sometimes.

The graft material we usually use in this practice is Bio-oss and it is derived from cow bone, it has been processed and is suitable for human use. This is covered with a membrane called Bio-Gide which is derived from a pig.

### **TYPE OF ANAESTHETIC**

The procedure is usually performed under a local anaesthetic only. However, we can add IV sedation to relax you if you are anxious about the procedure.

### **AFTER IMPLANT PLACEMENT**

 After the procedure there will be some discomfort and swelling. The degree of swelling will depend upon the number of implants placed and whether or not additional surgical procedures were carried out. Occasionally along with the swelling there may also be slight bruising of the skin overlying the area, which will fade over a week.

If you are a smoker or have a pre-existing medical condition, which affects soft tissue healing, the amount of swelling may be greater. The gum tissue in the region where the implants have been placed may change appearance or colour and take on a white appearance for a short time (normally two weeks) after surgery. After 6/10 days once the soft tissue has healed sufficiently the stitches are removed, however if dissolving stitches have been used this may not be necessary. During this period it may not be possible to wear dentures.

After this stage the implants will be left undisturbed for at least 2 months to attach to the jawbone. During this period the top of the implant may show through the gum slightly and metal may become visible. Although this is normally no cause for concern, should it occur please contact the practice to have the area checked.

### **MAKING THE NEW TEETH**

After a 2 to 6 month period a second procedure is required, under local anaesthetic, to expose the implants and check for firm bony attachment.

Once the implants have been uncovered and bony attachment confirmed a healing collar will be connected on top of each one, which will be used to shape the gum around the neck of the new crown. This intermediate stage will last approximately 2-3 weeks allowing time for the gums to settle and form a tight attachment to the healing collars. During this time the healing collars will become visible as the gum shrinks slightly exposing the underlying metal.

Once soft tissue healing is completed an impression will be taken and sent for the construction of the posts/ abutments and the final crowns. The final teeth will be made to cover as much of the exposed metallic areas possible improving the final appearance.

### **TREATMENT TIMING**

The total treatment time required will vary with the degree of difficulty and the amount of work needed. It is important to bear in mind that the implant components have to be made individually to suit your specific requirements and mouth.

This type of precision work is very time consuming and cannot be rushed, as it must be of the highest quality. Prior to fitting the finished teeth a variable number of visits may be necessary to make fine adjustments to the teeth. Therefore, it is important to keep your dentist informed of any travel arrangements or important engagements you may be planning and to give as much notice as possible.

### **WHAT HAPPENS IF THE IMPLANTS DO NOT TAKE**

Fortunately this occurs rarely as potential problems should have been anticipated and discussed with you before treatment starts. Approximately 2% [two out of every hundred implants placed] fails. We do not know the reasons for this. Up to 10% of implants may fail in areas where bone quality is not good and bone grafts have been undertaken. If we felt that this might be likely in your case we would already have discussed this with you. Should an implant fail to take then it is often possible to replace it with a second implant at the same time as the first implant is removed. It is not difficult to replace the failed implant at this time, as it will be very loose and is easily removed. It has been shown that alcohol and tobacco consumption can reduce the rate of success. These habits also have an effect on the rate of healing and may increase the chances of post-operative infection.

If it is not possible to place a second implant at this visit it may be necessary to clean the area where the failed implant has been and add an artificial synthetic bone substitute to encourage the bone to re-grow. If sufficient bone re-grows it may then be possible to place another implant but you will have to wait for up to six months to have this second implant placed.

### **AFTER CARE AND MAINTAINENCE REQUIREMENTS FOR IMPLANTS**

Implants are not "Fit and Forget”. They need the same care and attention as natural teeth. On completion of treatment it will be necessary for you to attend a number of recall appointments to check the condition of the implants and to adjust the bite if required. After this, regular six monthly dental check-ups are required to monitor the condition of the implants and any remaining natural teeth. Also regular hygiene maintenance appointments, as a build of plaque will cause gum problems and possible bone loss from around your implants, resulting in their eventual loss. If you have a mixture of natural teeth and implants in your mouth it is very important to maintain the health of the natural teeth. Should the natural teeth become infected or are lost for any reason the remaining implants may be damaged by the extra pressure caused by the additional work load.