



## Before Treatment Begins

As you consider having extensive dental treatment, it may be beneficial for you to review the following points:

### **Time Commitment.**

Because of the nature of dental appointments, it may be necessary for you to take some time off work. A few longer appointments are generally more efficient and less inconvenient than many short appointments. This will minimize your time in the Clinic. Usually, the best time to have a long appointment is in the morning. Once the treatment has begun, it needs to be completed in a timely fashion. If treatment is delayed or missed, it could change the proposed treatment plan. This could adversely affect the total cost to you.

### **Dentistry is both an art and a science.**

In complicated and technically difficult cases, and because of our high standards, it may prove necessary to redo a portion or go back and retake impressions or remake crowns, etc.

### **Make certain you are aware of what treatment is required and the goals of treatment.**

If you do not understand why we have made a particular recommendation or treatment sequence, or the length of treatment required, please ask us for clarification before treatment begins. It is possible that previously undetected dental problems will be discovered once tooth preparation has begun. When this occurs after the treatment plan has been developed, you will be immediately informed.

### **You should be comfortable with all financial arrangements before any treatment is begun.**

Establish your dental budget. This will determine how much and how quickly treatment can proceed. Understand that you are ultimately responsible for the total cost of treatment. If you would like to have more treatment than you can easily afford at one time, the dental procedures can be done in phases over months or years. Payment is expected as work is completed.

### **Thorough oral self-care is very important, both at the beginning of treatment and afterward.**

The better your oral health is, the easier the restoration process will be. You may be asked to see the hygienist to ensure good oral hygiene before we begin treatment and maintain appointments until after all restorative treatment is completed.

### **While dental restorations function well for years of service, nothing lasts forever.**

Not us, not dental restorations. We use the best available dental materials and techniques, but the reality is that some restorations simply last longer than others. With today's longer life span, the restoration might even wear out! The better you maintain your dental restorations, the longer they will last. Just as with anything else, proper maintenance is required.

Before beginning treatment, understand clearly what will be required of you for daily oral self-care, your regular dental hygiene recall appointments, and the limitations of the restorations you will receive. This means that you must brush and floss your teeth as instructed every day. When extensive dentistry is completed, a 3- to 6-month interval for dental hygiene recall appointments is strongly advised.

### **Dental restorations are subject to the same physical abuse as natural teeth.**

Whatever oral habits will break a natural, undrilled, undamaged tooth—such as chewing ice, biting fingernails, hard objects etc.—will probably be able to break a restoration as well. Expansion and contraction for hot liquids and cold foods can cause damage, as can the wet, dark, bacteria-filled oral environment of the oral cavity.

If you have ever considered whitening your teeth, the time to do it is before dental restorations are placed in teeth that are visible when you talk or smile. If you are interested in tooth whitening, or a shade change ask us now!



## Have Missing Teeth Replaced

Most adults can expect to have 32 teeth. The four third molars, or “wisdom” teeth, are often extracted because they do not grow into the mouth well or there is not enough room for them to remain in proper alignment. It is very unusual to have wisdom teeth replaced. But the other 28 teeth are needed. Your mouth, jaw, and body developed together over millions of years. They are designed to operate together at peak efficiency. When you lose a tooth, the efficiency decreases and function suffers. When you lose a tooth, you lose some ability to chew food properly. This may mean that you either place more stress on the other teeth in order to chew all the food you eat, or you do not chew well enough and what is swallowed is not quite ready to be digested. This can lead to digestive difficulty. Or you might switch to a diet that consists of softer foods that do not have to be chewed as much. You might have to eliminate certain favourite foods because you cannot chew them thoroughly. For each missing tooth, you lose approximately 10% of your remaining ability to chew food.

Other problems also occur. The teeth adjacent to the space left by the missing tooth will eventually shift. If for example, a lower tooth is extracted, the opposing tooth in the upper jaw will grow slowly (or sometimes quickly) longer in a downward direction into the missing tooth space. This is called *extrusion* or *supereruption*. The teeth on either side of the missing tooth space will move and tilt off their proper vertical axis and drift into the missing tooth's space. This can make these teeth more prone to decay and gum disease because it is much harder to keep the teeth clean when they are not aligned properly. Root structure that is normally covered by gum and bone may become exposed. All this can happen if one tooth is lost. Other major problems can occur if multiple teeth are lost. There is a loss of the arch length, the distance from the back of the last tooth on one side of your mouth to the back of the last tooth on the other side of your mouth. With collapsed bite and loss of vertical dimension, the distance from your chin to the tip of your nose decreases, making your face shorter. Extrusion and movement of your maxillary (upper) alveolar bone until the gum tissue from the upper jaw can touch the teeth or gum tissue of the other jaw causes loss of facial tone and shape. The facial muscles of the cheeks and mouth sink into the edentulous (extraction) site. There can also be severe cosmetic problems when the extracted tooth's space is visible when you talk or smile. This is not a pretty sight to anyone. There is loss of self-image and self-esteem and a feeling that you are getting old. Once you start losing teeth, you can actually start to look old. Losing a tooth is pretty serious. The longer you wait after a tooth is extracted, the more difficult and expensive it can become to make the replacement you need. With very few exceptions, it is better to replace missing teeth as soon as possible. Evolution designed you to chew your food with 28 teeth.

We will discuss with you the type of replacement that would be best suited for you. You can choose to do nothing at all and leave the space or spaces, but as you can tell, this is not usually recommended. You can have a fixed replacement made that could be an implant, a conventional bridge (crowns/caps), a bonded resin bridge, or a combination of implants and bridges. You could also have a removable partial denture made. The advantages of the fixed replacements are that they are not designed to come out of your mouth at any time, they are the easiest to live with, feel more like the original teeth, and are perhaps more cosmetic than removable dentures. A removable partial denture is held in place by metal clasps that may be visible. It is bulkier and may interfere with your speech for a period of time. However, generally, dentures cost less than a fixed replacement.

Your chewing apparatus, jaws, and teeth were evolved to function in a particular fashion. The interaction is complex and marvellous. Loss of teeth degrades this function. Preserve your health. Replace missing teeth as soon as suggested.

**If you have any questions about replacing missing teeth, please feel free to ask us.**



# Crowns and Bridge: Procedural Overview

## Tooth Preparation, Impression, and Provisional Restoration

### Appointment Expectations

Crown and bridge tooth preparation involves multiple appointments. The first appointment will include preparing the tooth (teeth), taking impressions, and making a provisional (temporary) restoration. This appointment will usually take the longest and be the most involved. The more teeth that we prepare for crowns, the longer the appointment will last.

### Tooth Preparation

The preparation of the teeth consists of shaping and removing tooth structure. This tooth reduction allows the ideal thickness of metal, porcelain, or metal and porcelain. The amount of tooth reduction necessary depends on the material we have selected; different types of crowns require different designs. We will make sure that you are comfortable throughout the entire procedure by numbing the area as needed.

Sometimes, because of the position of the soft tissue (gums), it may be necessary to trim or shape the soft tissue around the teeth. If we find that, due to unforeseen circumstances, the tissue removal will be complicated, you may be referred to a periodontist (gum specialist) for this procedure. If the tissue does not need to be reshaped, we most often use a “retraction cord” that is fitted and placed around the tooth. This cord temporarily repositions the gum tissue away from the prepared portion of the tooth and makes it possible to get a better impression.

### Taking Impressions

Once the teeth have been adequately prepared, the final impressions are made. During this impression procedure, the prepared portions of the tooth must be clearly visible. The cleaner the prepared teeth are, the better the impression will be. To ensure accuracy we often take a second impression. This is a difficult and exacting task and some of the aspects of getting an acceptable impression are not in our control.

The impression material is mixed and placed into a special tray that conforms to the size of your mouth. Impression material is fairly soft when mixed, similar to cold molasses. Once placed in your mouth, the impression material will set in just a few minutes. Depending on the type of impression technique used, a separate model of the opposing teeth may also be made.

An impression of your bite (bite registration) will be used to be sure your final crown(s) will fit together with the opposite jaw, just as they did before. All the above take at least two appointments to finish. Tooth preparation, impressions, and temporary crown, bridge, or inlay/onlay will be done at the first appointment. Permanent cementation will take place during the second appointment. Because of the highly technical nature of the process and our exacting standards, we may need to take more than one impression.

### Temporary or Provisional Restorations

After the impression is taken, the provisional (temporary) restoration(s) will be constructed. The temporary plastic/resin crown(s) replaces the prepared tooth structure and protects the tooth while the final crown is being fabricated. Provisional restorations are held in place with a temporary cement and will usually remain in your mouth for a minimum of 2 weeks—longer if the required treatment is complex.

### Your New “Look”

At the initial appointment we will make a determination of the shade of porcelain (or resin) to be used in order to obtain the best aesthetic results. You will, of course, participate in this process. Many times we will take photographs of your teeth to better match the shade. The impression, bite registration, and shade information are sent to a laboratory; and the crown(s) or bridge(s) is constructed according to our explicit work order. The returned restoration will be ready for cementation (if simple) or for a casting try-in (if more complicated).

### Following the First Appointment

How will you feel after the appointment is completed? Most patients note their gingival (gum) tissue is sore for a day or two. The less modification or manipulation of the gingival tissues, the less sore you will be. Some patients notice tooth sensitivity, especially to cold, but that it goes away pretty quickly. Analgesics (pain relief medication) are not usually necessary. If we expect you to be more than normally uncomfortable, we will inform you at the end of the appointment.



## Materials Options: An Overview

When a natural tooth undergoes extensive damage, it cannot be successfully restored for the long term with a “regular filling”—one placed by the dentist in a single Clinic appointment. Materials constructed and processed in a laboratory are stronger and will last longer. All materials for cast restorations have advantages and disadvantages. The following is a summary of the materials that can be used.

We will recommend the best material to meet your specific needs and answer any questions you have. Longevity of any of the restorations depends on the quality of the materials (and we only use the best), the technical skills in construction and placement (and we provide the best service possible), and what you do to and with the restorations once they are in your mouth. Clenching and grinding habits will significantly shorten the useful life of any restoration placed. What can break your natural tooth can break any restoration. Your oral self-care will affect the length of service of the restoration. You will need regular dental examinations and hygiene maintenance (cleaning) at intervals determined by your particular oral health requirements. A rule of thumb is that the more restorations you have in your mouth, the more care you (and they) will need. Any problem that begins can be discovered and corrected when it is small: with regular dental examinations, you can protect your investment.

### Partial Coverage Restorations: Inlays and Onlays

Partial coverage restorations are indicated when there is sound remaining tooth structure that does not need to be included in the preparation. Advantages of an inlay or onlay include less drilling than for a full coverage crown. Because of aesthetics’ and concern over potential allergic reactions to metal, dentistry is and has been moving away from any restorations that have metal in them.

**Gold Alloy**—Gold has been used successfully in tooth restoration for many years with a long history of service. The yellow colour might be visible when you speak or smile and for that reason is not considered an aesthetic material. It is, however, useful for small to medium restorations and for those who brux or grind.

**Laboratory-Processed Resin**—This is an excellent cosmetic choice because it can closely match natural tooth colour. Laboratory-processed resins are well suited for small to medium restorations but not as successful in patients with a tooth grinding habit. The restorations have a tendency to break under extreme compressive forces. A mouthguard may be recommended for protection.

**Porcelain/Ceramic**—Excellent for use in cosmetic dentistry, porcelain/ceramic restorations are used to restore small-to medium-sized cavities. The material is more wear-resistant than resin but can wear opposing enamel. It is not as successful for patients who brux or grind and has the potential to break under extreme biting forces. A mouthguard may be recommended for protection.

### Full Coverage Restorations: Crowns and Bridges

Full coverage restorations are indicated when the entire remaining tooth structure needs protection or is vulnerable to fracture. A full coverage crown requires more preparation than an inlay or onlay.

**Full Cast Gold (High Noble)**—Made of a gold alloy, full cast gold is the longest lasting of any of the laboratory-processed materials—20+ years. The alloy consists of gold, silver, palladium, and sometimes zinc, copper, and platinum. Although it is a very strong material, the yellow colour makes it not as aesthetically pleasing as other options.

**Full Cast Noble**—Similar in properties and qualities to full cast gold, this material contains mostly palladium plus silver, gold, and other trace metals. Full cast noble material is more silver in colour than a full noble metal.

**Porcelain Fused to Gold (High Noble or Noble Alloy)**—This material is very aesthetic and can last 10 to 20 years. The gold substructure is covered with porcelain, which can wear opposing teeth or fracture under forceful biting or grinding. The porcelain can be applied to just the surface of the crown facing on cheek. The result will not be as aesthetic, but will last longer. A mouthguard may be recommended for protection.

**All Ceramic or Porcelain**—This is the newest technology in laboratory-processed restorations and is considered very aesthetic. No metal is used in the process, and therefore no metal will ever be visible. It is excellent for restoration of back teeth; expected service life is 10+ years. This type of restoration can be cemented or bonded in place. The same cautions exist as with any porcelain or ceramic material: it can wear opposing natural enamel, and a mouthguard may be recommended for protection from bruxing or grinding. Some processes in fabrication of the all ceramic or porcelain crown are actually controlled by a computer.



## Cast Porcelain Fused to Metal Restorations

A porcelain fused to metal restoration can be used in the same areas as the cast gold restoration. Since the metal is covered with a layer of porcelain, it has a much more natural appearance than a gold casting and more closely resembles a natural tooth. It also has a fairly long life expectancy of 8 to 10 years and can last longer than 25 years. This is the most common crown fabricated by dentists in the UK. When made with a noble or semi-precious metal, it usually has a high content of gold, platinum, or palladium. With porcelain fused to metal crowns, the porcelain usually covers the metal on the biting, cheek side and part of the tongue side surfaces. There is often a narrow band of uncovered metal on the tongue side. Some preparations need to have a metal collar on the cheek side, near the gum. **If you think that you will find any display of metal objectionable, let us know before the tooth is prepared.** We will discuss your concerns and either modify the porcelain to metal crown preparation or change to an all-ceramic crown if possible.

An outside laboratory is involved in the construction of the porcelain to metal crowns, which adds to the cost and extends the treatment time. Crowns are held in place by dental cement that permanently fixes the crown onto the tooth.

Some of the disadvantages of porcelain fused to metal crowns are similar to those of the cast gold crown. They are expensive. They require at least two appointments to complete. Porcelain fused to metal crowns, require more preparation of the tooth than is necessary for gold crowns. Because it is a restoration composed of several different materials (metal, porcelain, and opaque), there are potentially more problems. Cohesive fracture of the porcelain or a fracture of porcelain from the metal is possible. The crown in these instances may still be useful, but not as aesthetic. Sometimes it can be repaired and sometimes it must be replaced. Because porcelain is hard, it may wear the enamel of the opposing teeth at a rate of approximately 100 microns (0.1 mm) per year. This may not sound like a lot of wear, but in the context of the mouth, it can be quite significant. Porcelain fused to metal crowns are not usually considered a conservative type of restoration, but in cases where there has been considerable destruction of the natural tooth structure, they are the restoration of choice. In the preparation (drilling) of the natural tooth, the nerve in the tooth may become damaged and endodontic therapy (root canal treatment) may be required. While unfortunate and unpredictable, this is not uncommon.

If recession of the gum tissue occurs around the crown, a dark metal line may appear or the root may become exposed. This does not necessarily mean that the crown has to be replaced. It may still function well but not be as aesthetically pleasing in appearance. Correction by periodontal plastic surgery is possible.

The cast porcelain fused to metal restoration produces a more natural looking appearance than with a gold crown, although some of the metal substructure may be visible. This restoration can be successfully used to replace a great deal of missing tooth structure. They can last a long time with proper care.

If you have any allergies to metals, please let us know before the preparations are begun.



## Bridges: An Overview

Replacing missing front teeth can obviously improve the appearance of your smile. What most people don't think about is what happens when a missing back tooth is not replaced. Replacing a back tooth will help you regain your normal ability to chew food and digest it properly. Each time you lose a tooth, you lose about 10% of your ability to chew. When a tooth is lost, the other teeth surrounding the space tend to move into the empty space. This contributes to an increased opportunity for decay and gum disease to begin, along with bite problems and a potential for other dental problems. Missing teeth should always be replaced—the sooner, the better.

Fixed bridges are one of the possibilities that exist for the replacement of one or more missing teeth. Other alternatives are dental implants, Maryland (adhesive) bridges, partial coverage bridges, and removable partial dentures.

Advantages of the fixed bridge include proven reliability and longevity. Disadvantages include cost, increased difficulty in proper cleaning by the patient, and occasionally, the necessity of preparing a tooth for an abutment (bridge support), which might not have been previously filled or even damaged.

One or more teeth can be replaced by a fixed bridge. The design of the bridge is affected by, among other factors, the number, strength, and position of the remaining teeth and the patient's ability to properly clean the completed bridge. Generally speaking, the support for the bridge should be equal to or better than the root support of what the missing teeth had.

The teeth that are to be the supports for the bridge are prepared similar to the preparation of a single crown. The tooth is made smaller by about 1 to 2 millimetres, depending on the part of the tooth being drilled. An impression is made of the prepared teeth and sent to a lab. While the bridge is being made, the prepared teeth are protected by a well-designed temporary bridge. Once the final bridge has been put in with final cement, it is not easy to get it off again without permanently damaging the porcelain and metal.

Your oral self-care must include thorough plaque removal, especially around the bridge. We will show you how to properly clean it. It is important that you follow our recommended dental hygiene recall schedule. Frequent examinations are one way to protect your investment and to maintain optimal oral health.

## Full Ceramic and Porcelain Bridges

For several years, dentistry has provided very strong single-unit all tooth-coloured crowns. Problems with metal sensitivities and obtaining an excellent colour match with porcelain fused to metal crowns were the driving forces in promoting research and development for metal-free crowns.

For several years, dentists have been able to place full ceramic/porcelain bridges to replace a missing front tooth. Biting on front teeth does not generate as much force as biting on back teeth. Recently, dental research has developed a very good metal substructure substitute for replacing missing back teeth. These full ceramic/porcelain bridges can be used in combinations of up to five missing and supporting teeth. The ceramic substructure is not quite as strong as metal, but it is clinically acceptable.

Advantages over metal/porcelain bridges include an excellent aesthetic appearance, absolutely no metal display, and no considerations of possible metal allergy. Disadvantages include a slightly higher cost and higher technique sensitivity. As with metal supported bridges, the patient's oral habits, types of food eaten, and daily oral self-care will have a great effect on the longevity of the bridge. We feel confident enough of the full ceramic and porcelain bridges to offer this service to you.

A newer option for metal-free full ceramic/porcelain crowns and bridges is the E-max or Zirconia ceramics. This innovative system uses a zirconium oxide base, which provides greater strength than was previously possible in full ceramic/porcelain crowns and bridges. Zirconia bridges use a conventional impression as with other crown and bridge procedures, but the manufacturing of the crown or bridge is accomplished in a computer-controlled milling unit. This technique requires less preparation of the tooth. The crowns and bridges produced by this system are four times stronger than the full ceramic/porcelain crowns and bridges and are highly fracture-resistant with excellent aesthetic properties. As with full ceramic/porcelain crowns and bridges, there are additional costs to produce these high-quality restorations. We will provide you with information regarding your oral conditions to help you select the strongest and longest-lasting material for your new restoration.