Dental Filling Options

Overview

Thanks to advances in modern dental materials and techniques, dentists have more ways to create pleasing, natural-looking smiles. Dental researchers are continuing their often decades-long work developing materials, such as ceramics and polymer compounds that look more like natural teeth. As a result, dentists and patients today have several choices when it comes to selecting materials to repair missing, worn, damaged or decayed teeth.

These new materials have not eliminated the usefulness of more traditional dental materials, such as gold, base metal alloys and dental amalgam. That’s because the strength and durability of traditional dental materials continue to make them useful for situations, such as fillings in the back teeth where chewing forces are greatest.

Restoring Your Smile: Dental Filling Choices

What's Right for Me?

Several factors influence the performance, durability, longevity and cost of dental restorations. These factors include: the patient's oral and general health, the components used in the filling material; where and how the filling is placed; the chewing load that the tooth will have to bear; and the length and number of visits needed to prepare and adjust the restored tooth.

With so many choices, how do you know what's right for you? To help you better understand what's available, here are the advantages and disadvantages of commonly used dental restorations.

The ultimate decision about what to use is best determined by the patient in consultation with the dentist. Before your treatment begins, discuss the options with your dentist.

Types of Dental Restorations

There are two types of dental restorations: direct and indirect.

Direct restorations are fillings placed immediately into a prepared cavity in a single visit. They include dental amalgam, glass ionomers, resin ionomers and some resin composite fillings. The dentist prepares the tooth, places the filling and adjusts it during one appointment.

Indirect restorations generally require two or more visits. They include inlays, onlays, veneers, crowns and bridges fabricated with gold, base metal alloys, ceramics or composites. During the first visit, the dentist prepares the tooth and makes an impression of the area to be restored. The impression is sent to a dental laboratory, which creates the dental restoration. At the next appointment, the dentist cements the restoration into the prepared cavity and adjusts it as needed.

Amalgam Fillings

Used by dentists for more than a century, dental amalgam is the most thoroughly researched and tested restorative material among all those in use. It is durable, easy to use, highly resistant to wear and

relatively inexpensive in comparison to other materials. For those reasons, it remains a valued treatment option for dentists and their patients.

Dental amalgam is a stable alloy made by combining elemental mercury, silver, tin, copper and possibly other metallic elements. Although dental amalgam continues to be a safe, commonly used restorative material, some concern has been raised because of its mercury content. However, the mercury in amalgam combines with other metals to render it stable and safe for use in filling teeth.

While questions have arisen about the safety of dental amalgam relating to its mercury content, the major U.S. and international scientific and health bodies, including the National Institutes of Health, the U.S. Public Health Service, the Centers for Disease Control and Prevention, the Food and Drug Administration and the World Health Organization, among others have been satisfied that dental amalgam is a safe, reliable and effective restorative material.

Because amalgam fillings can withstand very high chewing loads, they are particularly useful for restoring molars in the back of the mouth where chewing load is greatest. They are also useful in areas where a cavity preparation is difficult to keep dry during the filling replacement, such as in deep fillings below the gum line. Amalgam fillings, like other filling materials, are considered biocompatible—they are well tolerated by patients with only rare occurrences of allergic response.

Disadvantages of amalgam include possible short-term sensitivity to hot or cold after the filling is placed. The silver-colored filling is not as natural looking as one that is tooth-colored, especially when the restoration is near the front of the mouth, and shows when the patient laughs or speaks. And to prepare the tooth, the dentist may need to remove more tooth structure to accommodate an amalgam filling than for other types of fillings.

Composite Fillings

Composite fillings are a mixture of glass or quartz filler in a resin medium that produces a tooth-colored filling. They are sometimes referred to as composites or filled resins. Composite fillings provide good durability and resistance to fracture in small-to-mid size restorations that need to withstand moderate chewing pressure. Less tooth structure is removed when the dentist prepares the tooth, and this may result in a smaller filling than that of an amalgam. Composites can also be "bonded" or adhesively held in a cavity, often allowing the dentist to make a more conservative repair to the tooth.

The cost is moderate and depends on the size of the filling and the technique used by the dentist to place it in the prepared tooth. It generally takes longer to place a composite filling than what is required for an amalgam filling. Composite fillings require a cavity that can be kept clean and dry during filling and they are subject to stain and discoloration over time.

Ionomers

Glass ionomers are translucent, tooth-colored materials made of a mixture of acrylic acids and fine glass powders that are used to fill cavities, particularly those on the root surfaces of teeth. Glass ionomers can release a small amount of fluoride that may be beneficial for patients who are at high risk for decay. When the dentist prepares the tooth for a glass ionomer, less tooth structure can be removed; this may result in a smaller filling than that of an amalgam.

Glass ionomers are primarily used in areas not subject to heavy chewing pressure. Because they have a low resistance to fracture, glass ionomers are mostly used in small non-load bearing fillings (those between the teeth) or on the roots of teeth.

Resin ionomers also are made from glass filler with acrylic acids and acrylic resin. They also are used for very small, non-load bearing fillings (between the teeth), on the root surfaces of teeth, and they have low to moderate resistance to fracture.

Ionomers experience high wear when placed on chewing surfaces. Both glass and resin ionomers mimic natural tooth color but lack the natural translucency of enamel. Both types are well tolerated by patients with only rare occurrences of allergic response.

Indirect Restorative Dental Materials (Two or more visits)

Sometimes the best dental treatment for a tooth is to use a restoration that is made in a laboratory from a mold. These custom-made restorations, which require two or more visits, can be a crown, an inlay or an onlay. A crown covers the entire chewing surface and sides of the tooth. An inlay is smaller and fits within the contours of the tooth.

An onlay is similar to an inlay, but it is larger and covers some or all chewing surfaces of the tooth. The cost of indirect restorations is generally higher due to the number and length of visits required, and the additional cost of having the restoration made in a dental laboratory. Materials used to fabricate these restorations are porcelain (ceramic), porcelain fused to a metal-supporting structure, gold alloys and base metal alloys.

All-Porcelain (Ceramic) Dental Materials

All-porcelain (ceramic) dental materials include porcelain, ceramic or glasslike fillings and crowns. They are used as inlays, onlays, crowns and aesthetic veneers. A veneer is a very thin shell of porcelain that can replace or cover part of the enamel of the tooth. All-porcelain (ceramic) restorations are particularly desirable because their color and translucency mimic natural tooth enamel.

All-porcelain restorations require a minimum of two visits and possibly more. The restorations are prone to fracture when placed under tension or on impact. The strength of this type of restoration depends on an adequate thickness of porcelain

and the ability to be bonded to the underlying tooth. They are highly resistant to wear but the porcelain can quickly wear opposing teeth if the porcelain surface becomes rough.

Return to Restoring Your Smile

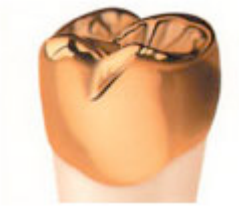
Porcelain-fused-to-Metal

Another type of restoration is porcelain-fused-to-metal, which provides strength to a crown or bridge. These restorations are very strong and durable.

The combination of porcelain bonded to a supporting structure of metal creates a stronger restoration than porcelain used alone. More of the existing tooth must be removed to accommodate the restoration. Although they are highly resistant to wear, porcelain restorations can wear opposing natural teeth if the porcelain becomes rough. There may be some initial discomfort to hot and cold. While porcelain-fused-to-metal restorations are highly biocompatible, some patients may show an allergic sensitivity to some types of metals used in the restoration.

Gold Alloys

Gold alloys contain gold, copper and other metals that result in a strong, effective filling, crown or a bridge. They are primarily used for inlays, onlays, crowns and fixed bridges. They are highly resistant to corrosion and tarnishing.



Gold alloys exhibit high strength and toughness that resists fracture and wear. This allows the dentist to remove the least amount of healthy tooth structure when preparing the tooth for the restoration. Gold alloys are also gentle to opposing teeth and are well tolerated by patients. However, their metal colors do not look like natural teeth.

Base Metal Alloys

Base metal alloys are non-noble metals with a silver appearance. They are used in crowns, fixed bridges and partial dentures. They can be resistant to corrosion and tarnishing. They also have high strength and toughness and are very resistant to fracture and wear.

Some patients may show allergic sensitivity to base metals and there may be some initial discomfort from hot and cold. However, due to their metal color, gold alloys do not look like natural teeth.

Indirect Composites

Crowns, inlays and onlays can be made in the laboratory from dental composites. These materials are similar to those used in direct fillings and are tooth colored. One advantage to indirect composites is that they do not excessively wear opposing teeth. Their strength and durability is not as high as porcelain or metal restorations and they are more prone to wear and discoloration.

Frequently Asked Questions

- **If my tooth doesn't hurt and my filling is still in place, why would the filling need to be replaced?**
    - Constant pressure from chewing, grinding or clenching can cause dental fillings, or restorations, to wear away, chip or crack. Although you may not be able to tell that your filling is wearing down, your dentist can identify weaknesses in your restorations during a regular check-up.
    - If the seal between the tooth enamel and the restoration breaks down, food particles and decay-causing bacteria can work their way under the restoration. You then run the risk of developing additional decay in that tooth. Decay that is left untreated can progress to infect the dental pulp and may cause an abscess.
    - If the restoration is large or the recurrent decay is extensive, there may not be enough tooth structure remaining to support a replacement filling. In these cases, your dentist may need to replace the filling with a crown.
- **Are dental amalgams safe?**
    - Yes. Dental amalgam has been used in tooth restorations worldwide for more than 100 years. Studies have failed to find any link between amalgam restorations and any medical disorder. Amalgam continues to be a safe restorative material for dental patients.
- **Is it possible to have an allergic reaction to amalgam?**
    - Only a very small number of people are allergic to one or more of the metals used in amalgam fillings. In these rare instances, the filling may trigger a localized reaction that produces symptoms similar to a skin allergy. Often patients who have this reaction to amalgam have a medical or family history of allergy to metals. Another dental filling material will be used instead of amalgam in these situations.
- **Is there a filling material that matches tooth color?**
    - Yes. Composite resins are tooth-colored, plastic materials (made of glass and resin) that are used both as fillings and to repair defects in the teeth. Because they are tooth-colored, it is difficult to distinguish them from natural teeth. Composites are often used on the front teeth where a natural appearance is important. They can be used on the back teeth as well depending on the location and extent of the tooth decay. Composite resins are usually more costly than amalgam fillings.