

CAST GOLD

This material is generally considered to be the ultimate in strength and durability. It is the best material to use in situations where the tooth receives a huge amount of chewing stress e.g. your last top tooth, because it is closest to the fulcrum, i.e. the jaw joint and the filling is virtually impossible to see.

Disadvantages

Unrealistic Appearance when visible.

Cost - Similar to a crown, but do not be alarmed by the fact that it is made of gold. These restorations are no more expensive than a porcelain restoration.

Does not bond the tooth structure together and when performed as a simple filling (made directly in the mouth) may allow the development of future cracks underneath. However, if done as an onlay or crown (made outside of the mouth) the cusps are covered, protected and sealed under the umbrella of the gold, thus stopping the development of future cracks.

Advantages

Excellent life span - Wears like tooth enamel and these restorations are often maintenance free and can last 20 to 40 years.

Strength - As they are made of metal, they virtually never break.

WHAT TYPE OF FILLING DO I NEED?

FILLINGS - A "filling" is a general term for a material which is used to fill a hole in your tooth. This is done by your dentist and it is placed directly into your mouth. The hole is usually surrounded in part at least, by sound tooth structure. Common filling materials are composite resins or amalgams.

Sometimes half of the tooth falls off and the 'filling' then doesn't just fill a hole, it has to do the job of the missing portion of the tooth. In back teeth this means enlarging the filling to take the pressure of forming the cusp i.e. the mountain peak. This places higher demands on the restorative material we need to use and you should expect more likelihood of this breaking down again, if you choose the cheaper options. As there is no tooth structure holding the filling material in place, we need to provide a better hold on the tooth by either: (1) crowning it, or (2) putting in pins. Each case is unique and your dentist will discuss what they think is best for you.

INLAY - An inlay is a filling which is made outside of the mouth, i.e. in a dental laboratory. However, unlike a simple filling above, your cavity has to have a particular shape that is suited to this type of restoration. An inlay still serves the same purpose as a filling but usually gives a superior result.

ONLAYS - An onlay is an inlay with an extension "wing" that covers one or more of the cusps of your teeth. The cusps are the small mountain peaks on the top of the premolars and molars (back teeth). The extension stops the cusp from splitting away from the main body of the tooth and filling.

CROWN - A crown (also known as a cap) is also made outside of the mouth. It is like a hat that goes over the entire tooth - across the top, down the sides and binds it all together, stopping future cracks and cusp breakages and providing very good retention. They are very

solid, look good and are durable restorations. There are different types of crowns. Some are more prone to crack than others, some look more natural than others and some require less tooth to be drilled away.

Your dentist will advise you what style of restoration is best suited for your situation.

Usually, the dentist is able to ascertain what sort of material they are going to use and the style of the cavity preparation before they start. However, it is very common these days, especially with 'baby-boomers', to remove an old amalgam and to find a substantial crack in the tooth underneath. The dilemma then arises as to which option is best to proceed with. Some form of cusp protection is obviously indicated to stop the crack spreading into the nerve. You can leave it and wait to see what happens, but unfortunately these cracks usually get bigger and often cause half the tooth to break away or threaten the nerve. If half the tooth breaks away, you may not have enough strength in the tooth to support a crown. Extraction of the tooth is a very real possibility. If the nerve is damaged you may need an expensive and unpleasant root canal therapy, plus a crown anyway. Suffice to say that you should be prepared if the dentist has to stop half way through a filling and discuss with you the implications of new information as these hidden internal fractures are not able to be seen on x-rays and only become apparent once the dentist begins the tooth preparation. The decision may not be a simple one and often adds additional costs. It is best to discuss the options with your dentist, if and when these complications arise.

Regular checkups can reduce the likelihood of unexpected, costly outcomes and if decay is present, smaller fillings can be completed at the time of your visit.

This document has been produced for the international dental profession. The English (US) dictionary has been used as the basis for the text.



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At your examination appointment we found that you needed either replacement fillings or new fillings. So that you are properly informed we wish to detail your options regarding which type of restoration you could have and the advantages and disadvantages of each type. As the patient, it is your right to have which ever type of filling you like, but when you chose an option with inherent disadvantages or higher risk of problems, you need to be aware of them, and be fully prepared to accept the consequences and not think unfavorably of the dentist's workmanship if those consequences arise.

AMALGAM – “silver fillings”

A time honored restoration that gives good long term results from a functional point of view.

Disadvantages

Colour - The major problems with amalgam fillings is that they look grey or black and most of us prefer a more natural tooth colored appearance.

Cracks - Another problem with amalgam is that it does not usually bond or “stick” to tooth structure and so it allows the long term development of cracks underneath the filling. These cracks start off small but eventually spread down into the core of the tooth and cause problems. Quite often the side of the tooth will simply snap off when you are eating. Other times the crack will penetrate straight down towards the nerve and although you can't see it, it can cause an occasional pain when you chew crunchy foods like grain bread or muesli. This pain comes from microscopic flexing of the tooth causing the crack to open under the filling and stimulate the nerve. It generally requires a crown or onlay which cover the tooth and hold the crack together. If you have large amalgams on your molars (back teeth), it is highly likely that you will end up needing crowns or onlays on many or all of these teeth. You get cracks developing with age and with the associated wear and stress, which fatigue the teeth but this could take many years.

Mercury - Another problem with amalgam in the minds of some people is the presence of mercury. The mercury present in amalgam is bound up with silver and tin and is not readily available. Minute amounts may be liberated when chewing but the amount of mercury from this source has been reviewed by many leading health authorities and deemed to be substantially below any significant health risk. You should probably be more concerned about eating fish as there have been significant levels of mercury recorded in many larger varieties. If you have a personal belief that amalgams are harmful to your health your dentist can replace them for you.

Staining - Amalgam can cause staining in your natural tooth structure, i.e. not only does the amalgam look black or grey, but the metallic ions in it can leach out and percolate into the surrounding tooth structure causing it to become slightly grey. When you replace the amalgam with a white filling, the surrounding tooth structure still looks a little grey.

Expansion - A final area of controversy has been the tendency for some amalgams to expand slightly. It has been postulated that this may increase the outward pressure on the tooth cusps and lead to more cracking. A study conducted in Denmark revealed that amalgams placed after 1979 had a significantly higher incidence of cusp fracture than those placed before 1975. The authors speculated that this may have been in part due

to the higher expansion of the more modern amalgam, which contains copper to reduce corrosion.

Advantages

Wear resistance - It is common to have amalgams last 20 to 40 years. **Strength** - They are very strong and less prone to chipping and breaking, although it still occasionally happens.

Relatively less expensive than many other filling materials and methods used.

COMPOSITE RESIN – “white fillings”

These are white, plastic based materials with fine particles of quartz or glass which are designed in many shades and are matched to appear like your tooth structure. These fillings bond or stick to the tooth by chemical means and the dentist cures, or sets them with a light.

Composite resins are generally seen as suitable for small to medium sized fillings, although dentists sometimes use these materials on larger back teeth as many patients prefer and request these over amalgam. However the patient must accept the limitations and weaknesses inherent in this material.

Disadvantages

Difficult to get completely accurate placement - Requires greater skill and more time input from the dentist. As a consequence a composite resin filling is substantially more expensive than an amalgam.

Wear resistance is not quite as good as amalgam – However technology is improving rapidly in this area and latest generations appear to be almost equal.

Strength - They are not quite as strong as other alternatives, but still considered to be satisfactory for routine use. If a filling does break it is not because the dentist did something wrong, it is a simple fact that the biting pressure exceeded the cohesive strength of the material and you should not expect to have this filling replaced free of charge. If you wish to have your fillings guaranteed against breakage, cast gold would be your best option, but it will cost more.

Shrinkage - All plastics shrink a certain amount when they polymerize, (cure). Typically this is around 3% by volume. It causes fine white lines between the filling and the tooth, which can eventually fill with stain and show as a brown discoloration. Also, shrinkage at the base of the filling can sometimes cause strange symptoms such as sensitivity to biting crunchy foods. This is not due to a crack but due to a shrinkage void under the filling. Generally the dentist can engineer solutions that avoid these symptoms, however, sometimes a problem related to post-operative biting sensitivity still happens to the best dentist in the world. Shrinkages of composites can also be so severe as to cause a hairline crack to form on the outside of your tooth enamel, i.e. visible in your smile. This becomes more likely the bigger your filling and the weaker your remaining tooth. Therefore, we recommend alternatives to composite resin when you have a large filling which you would like to be tooth coloured.

Post-operative sensitivity as described above, has been a massive problem in the dental profession over the last 20 years and the causes and prevention are not fully understood. Although it is generally viewed as being under control, there are occasional problems.

Food traps - composite resins are soft, doughy-like materials and your dentist cannot pack them into the cavity with the same pressure as with amalgam. An unfortunate consequence of this can be the creation of a very fine gap between the teeth, which may lead to meat and fibrous foods

becoming jammed in this crevice. No matter how hard the dentist attempts to avoid this problem, using one or more of the myriad techniques available, they will always end up with a percentage of composite resins that cause this problem. Sometimes the dentist will build this percentage failure into their overhead and replace this filling at no charge to you and charge a higher fee for any composite resin – so expect the cost of composite resins to be much higher than amalgams. Occasionally these fine gaps will self-correct over the next month or so, but please contact the surgery if you are still getting food caught after three months, as it should be tightened. The tightening filling can sometimes be done as a filling within a filling, so you may not need the entire filling replaced.

Advantages

Lower cost than porcelain and gold.

These restorations are “white” and look reasonably like tooth structure.

The filling material actually bonds to tooth structure - Although it is somewhat debatable as to its effectiveness in the long term, we can say that in the short term, composite resin bonds the two halves of the tooth together. This logically reduces the likelihood of future development of cracked tooth syndrome or of cusp failure (i.e. where tooth cracks off from the filling).

GLASS IONOMER – “white fillings” fluoride releasing

These are often used under composite fillings as a liner or on children as a shorter term solution on deciduous teeth.

Disadvantages

Not as wear resistant as any of the other materials, but still acceptable in many situations such as small fillings on the biting surface and any sized filling on the side of the tooth or in between teeth.

Not usually as smooth on their surface as composite resin, but still smooth enough to give an acceptable mouth feel.

Appearance is sometimes a little opaque, i.e. can have slight colour mismatch to surrounding tooth structure.

Lack of strength - These materials, although constantly improving, are only still half the strength of composite resins and are not suitable for long term applications in high strength cavity requirements.

Advantages

Tooth coloured - Although they may not match perfectly, at least they are not black, grey or gold.

Less costly than gold or porcelain.

Chemically bond to tooth structure - These materials are unlikely to fall out when adhered to the side of your tooth, unlike other materials. This means that a more conservative and non-retentive cavity can be prepared and you may not need an injection.

Substantial fluoride release - This means there is a very low chance of ever getting decay around or underneath this filling. These materials are excellent for parts of the mouth where it is almost impossible to clean properly.

Ability to re-harden and reverse some decay - If you have very severe decay threatening the existence of the nerve in your tooth, we may place a glass ionomer in an attempt to heal and reverse the deepest one-third of the decay. This takes approximately one year and you may need to have the filling removed and replaced after this time - but this is a small price to pay compared to root canal therapy.

Non-shrinking - It is less likely to get cracking of remaining tooth structure or post-operative sensitivity. Because of these factors, we often use these materials as a foundation inside your filling and put a separate topping layer of composite resin to obtain the best of both worlds. Expect these double ‘sandwich’ fillings to cost slightly more, but they are well worth it.

PORCELAIN

Porcelain fillings are very hard, durable and look very natural. At this point in time these materials are considered to be the best tooth-coloured restoratives available. Usually the dentist takes a mould of the tooth and then sends it to a laboratory where the restoration is made and “baked” hard in a special machine. In the interim the dentist makes a temporary filling for you and you are given another appointment for a week or two later. After the filling is made by the laboratory it is sent back to the dentist who ensures that it fits properly and then cements it into place.

Disadvantages

More expensive - Similar in price to a crown. This is because of the additional steps required.

Take more time to complete - this type of filling cannot be completed in a single visit.

Occasional fracture - Porcelain is an inherently brittle material and it has to be designed to be a minimum of 2mm thick to resist fracture. Occasionally there is not 2mm of space available and the dentist may have to make a judgment in your best interest. Some people also bite heavier and stronger which leads to a higher risk of porcelain fracture or you can just be unlucky. A hard piece in your food can cause a sudden impact in a critical place on a porcelain filling. This may initiate a crack which goes on to grow over the next few months, resulting in a piece of porcelain breaking off from your filling. Once again, this is not the dentist's fault but it does occasionally happen and you will probably need to pay for a new restoration.

Advantages

Superb aesthetics - These restorations look more like a tooth than anything else available.

Good quality contact points - this means you are less likely to get food trapping between your teeth.

Excellent wear resistance - equal to or better than enamel. These fillings virtually never wear out.

Bonded into place - The material is glued into place and this reinforces the tooth structure and is likely to prevent cracking of the tooth.

Non-shrinking - Unlike composites, these materials are pre-shrunk before they go into the tooth. They do not shrink any further and do not cause shrinkage cracks in your enamel. They also have a lower incidence of post-operative biting sensitivity.

LABORATORY-MADE COMPOSITE RESINS

These materials have the same disadvantages and advantages as porcelain above with the exception that they tend to wear a little bit more than porcelain, however they are still very satisfactory.

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