

tooth is exposed, but do not be concerned if part of it is still covered with gum. You can make a real difference to the influence of decay on your childrens teeth by supervising regular brushing and by this simple dental procedure.

# Fissure Sealants and Preventative Resin Restorations

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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When fluoride was introduced into Australian water supplies in the 1960's it was intended that the fluoride would be ingested by children, incorporated into their tooth enamel and confer on them the life time benefits of reduced rates of decay.

**This has happened and it has been a major success in preventive dentistry – 60% overall reduction in decay and a 90% of decay decrease in the front teeth!**

However there have been some unintended consequences from the introduction of fluoride into the water. The one of relevance refers to the way in which decay develops within teeth, particularly the back teeth. Fluoride causes a tremendous increase in the hardness of the enamel and a decrease in the solubility of the enamel in response to an acid attack caused by plaque. This means the enamel is actually harder and decay does not become so evident to the dentist as it did previously. Instead of the decay forming an open cavity which was easily seen and easily felt by the sharp metal probe the dentist uses, decay now tends to start inside a tooth below the enamel. This can happen because the bacteria and saliva can get through the very fine "crack" on the surface of the tooth, particularly the back teeth or molars. We call the "crack" a fissure and once the bacteria penetrate this they can attack the softer portion of the tooth inside called the dentine. As a result of this, the decay can go undetected for many, many years and ends up in what dentists now refer to as a "fluoride bomb". The inside of the tooth is completely decayed but the outside looks fairly normal. Sometimes there is a slight discolouration evident through the enamel, but often the decay cannot even be felt with a sharp metal probe – this is of major concern to dentists because for decades we have relied on diagnosis of decay by feeling for any softening enamel with a metal probe. We can no longer do this.

To overcome these problems three treatments have been devised.

**1. Fissure Sealants** This procedure was started about 20 years ago and was tested and proven in the U.S. to make a significant difference to the progress of decay. The fissure sealant is a clear plastic resin, or sometimes a white resin which is put onto the surface of the tooth, covering the "crack" and it is bonded or stuck onto the tooth by a means of enamel bonding. Although this tended to work reasonably well the fissure sealants fell out at a pretty high rate and gradually, with time, fissure sealants fell into disrepute. This culminated in the World Health Organisation recommending that they not be done because of the high incidence of recurrent caries (new decay) around the edges of fissure sealants.

**2. Preventive Resin Restorations** is a more definitive treatment for sealing out decay on teeth. This involves cleaning out the organic debris in the crack (fissure) of the tooth rather than just burying it under a plastic sealant. The groove can either be cleaned out by an air abrasion device or more commonly, by a conventional drill with a special fine tip. There are advantages and disadvantages to each cleaning device.

The air abrasion device has no vibration and very little noise, other than a hiss, however it makes a fair amount of mess in the mouth from the particles of aluminium oxide which are used to create the abrasive effect. The drill is quick and clean but a lot of people worry about "having the drill", however neither technique causes any significant amount of pain at all.

Once the crack has been cleaned out, a proper assessment can be made as to whether there is any decay underneath the groove because this sort of decay cannot be reliably seen on X-rays. If there is decay (and decay is found in a surprising number of cases) then it is removed with either of the devices mentioned above.

Quite often the decay can be completely removed without any pain at all and without the need for injections. This is particularly true in cases of very shallow decay. If the decay gets deeper into the tooth (as happens in about 5% of cases), a local anaesthetic may be required to numb the tooth so that the decay can be removed properly without causing undue discomfort. Once the decay has been removed the tooth can be filled up using conventional filling techniques. Usually a tooth coloured white filling is used, which is bonded into the tooth.

If no decay is discovered after cleaning out the fissure, the tooth is treated with a mild acid gel in order to promote excellent adhesion, then a bonding resin is applied, followed by a plastic filling material or a semi liquid (flowable) composite resin. Either material is placed into the grooves and then light cured to harden it. This makes a beautiful, durable, white filling within the groove which is sealed very effectively to the enamel. The groove is filled up and stops food becoming caught, stopping the decay establishing itself under the enamel of molars or premolars.

**This is truly a remarkable advance in preventive dentistry - and children and adults treated like this can expect 10-20 years of service from these small restorations. This treatment is so effective, we consider it essential, not optional, that all children have their first and second molars treated if there is any evidence of staining of the groove, or the groove becomes 'sticky' to the dentists probe.**

**3. Glass-ionomer Preventive Sealants** - A dramatic development has occurred recently in prevention, pioneered by Australian dentists. It has been discovered that if a seal of a special material called glass ionomer is applied to the back molars immediately as they emerge from the gum, typically at age 6 and age 12, then they will probably never need a filling, a fissure sealant, or a preventive resin restoration, i.e. they have a good chance of being permanently decay free, without ever needing to be touched by a drill! This new material wears off over a year or so, but permanently hardens the enamel underneath.

**It is essential that you bring your children to the dentist as soon as you see the molars coming through the gum with about two thirds of the top of the tooth exposed.** This begins to happen at about 6 years of age with the 1<sup>st</sup> molar appearing behind the "baby" teeth. If the tooth has just started to come through, wait a few weeks till the majority of the

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