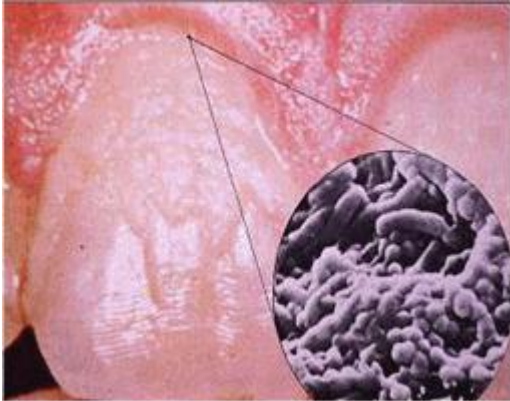


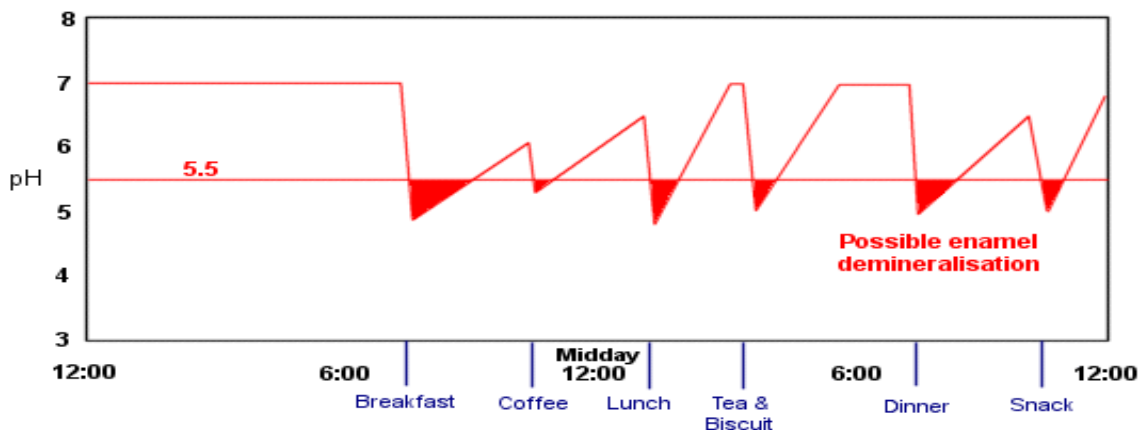
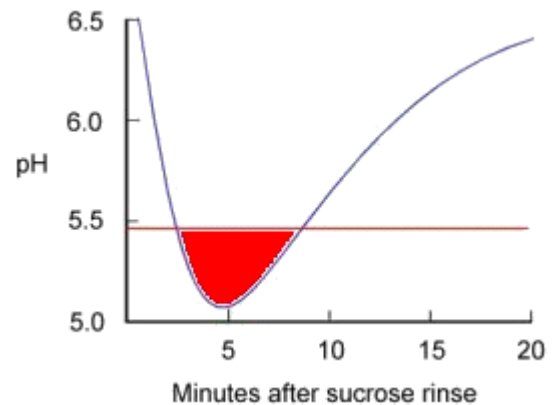
Dental Caries (tooth decay) is an infectious disease resulting in a progressive destruction of tooth tissue. It is the result of an interaction between bacteria from dental plaque, fermentable carbohydrates and tooth tissue over a period of time and can only occur when all these factors are present.

Dental Plaque is a film of bacteria that forms on the surface of teeth. A thin layer of saliva proteins stick to the surface of a tooth within minutes of being cleaned. If left undisturbed it will gather bacteria to form a thicker film of plaque.



Streptococcus mutans and *Lactobacilli* are bacteria that normally live in the mouth and collect in plaque. These organisms use sugars found in the plaque or saliva and create acid in the inner layers of the plaque adhering to the tooth surface. This increases the acidity (lowers the pH) on the tooth surface. When this reaches a critical level pH 5.2-5.5 for enamel **demineralization** starts to take place and calcium and phosphates diffuse out of (leave) the enamel or dentine.

This graph shows how acid is produced after taking sugar and the red part shows when decay will occur on the tooth. The saliva has calcium and phosphate which causes the pH to increase and the tooth **remineralises** (repairs)



The graph shows that the more often someone has sugar or refined carbohydrates the more they will lose calcium and phosphate from the tooth and so dental caries starts.

The thicker the plaque that is on a tooth the longer the acid attack will last. The more refined the carbohydrates such as sucrose and glucose the easier it is for the bacteria to produce acid.

Diets rich in soft, sticky, carbohydrate foods (refined sugars) assist plaque formation.

It cannot be rinsed off, but it can be removed by brushing, flossing and a dental scaling.

The rate of progression of caries depends upon the resistance of the tooth to dental decay which includes the chemical, structural form of the enamel surface.

Enamel consists of 96% by weight or 87 % by volume of mineral. The other 13% by volume is interprismatic space filled with protein, and water that allows a variety of ions to diffuse (move) in and out.

As enamel matures the level of fluoride increase due to the uptake from fluoride toothpastes. Fluoride is a chemical that hardens the enamel of a tooth Enamel with fluoride built into it is more resistant to decay.

We can add fluoride to a water supply, milk or salt so that fluoride is taken up by children when their teeth are growing and they will have 50% less decay. Young children and babies can be given fluoride drops or tablets when their teeth are growing if there is no fluoride in the water. We call this type of fluoride – “systemic fluoride” as it is given through the whole body.

A surface application of fluoride “topical fluoride” can be applied to teeth. This may be in the form of toothpaste, mouthwashes or varnishes applied at the clinic. Topical fluoride if applied to the very earliest stages of decay (white spot lesions) can stop the decay process.

Signs of tooth decay. The first sign of decay on a tooth will be a “white spot lesion”. This is seen on the smooth surfaces of the tooth especially where plaque is allowed to gather on teeth because of poor tooth brushing. If large deposits of plaque are cleaned off children’s teeth the enamel will often have changed colour and a white patch can be seen.

In its early stages decay is quite painless, as enamel has no nerve endings or live cells. Once the decay has spread into the dentine pain may be caused by hot and cold foods and sweet foods such as chocolate. Dentine has live cells called odontoblasts which have nerve connections to the pulp of the tooth. As the decay spreads further through the tooth the pain will last more than a few seconds and will be more severe.



Dental decay in babies and young children can be caused by long exposures to milk, fruit juice or sweet drinks which are put in feeder or baby bottles overnight. The decay can be very severe. Plain water is the safest drink to give the baby between meals.

In children the chewing surface with its grooves and pits is usually the first to decay. This is because dental plaque and bacteria accumulate in these areas and stay there. The areas between teeth (interdental) are also common places for decay to start. Tooth decay can start around and under old fillings that have cracked, chipped or broken down sometimes called secondary decay. Decay can also occur at the necks of teeth, at the gum line especially in patients who do not clean their teeth well.

Preventing Decay

Reducing the amounts of refined sugars in the diet is the most important factor. The frequency (more often) there is an intake of sugar the higher the decay rate.

Getting rid of dental plaque by regular brushing and interdental cleaning can prevent decay.

Fluoride in the water, salt, toothpaste, and mouthrinses can prevent and reduce decay.

Fissure sealants:



These are special filling materials that are bonded to the grooves and pits on the chewing surfaces of the back teeth to create a smooth surface to keep away the decay-causing bacteria.



Fluoride can be applied as a varnish to the teeth by the dentist /therapist/hygienist to prevent decay.