

## SECTION 1

### Tooth decay and gum disease

#### What is tooth decay ?

Tooth decay is caused by acid dissolution of the tooth surface. This occurs when bacteria colonize on the tooth surface in the form of a thin, sticky, colorless film (*dental plaque*). Soon after the intake of food, the bacteria in the dental plaque utilize the sugar from the food, to produce acid which dissolves the tooth surface. This leads to a loss of minerals from the tooth surface and results in tooth decay. If there is no intervention, constant loss of minerals causes the tooth surface to break down, and a cavity is formed.

The sectional view of a healthy tooth is shown in Figure 1.1. Tooth decay can develop in any part of a tooth. It usually develops on areas where dental plaque builds up easily and is difficult to remove, i.e. along the grooves on the biting surfaces, under contact areas between adjacent teeth, and around the gum margins, including the exposed root surfaces. Tooth decay at its initial stage is not noticeable and is symptom-free. It is only detectable by careful dental examination. Radiographic examination also picks up signs of decay especially when it spreads (Figure 1.2) beneath the outer surface of the tooth (*enamel*). Then, the affected tooth may become sensitive to temperature changes. The duration and severity of such sensitivity may increase as the decay progresses further and deeper towards the center of the tooth (*pulp*). At some stage, the *pulp* will become inflamed causing pain and discomfort. When the *pulp* is irreversibly damaged, the tooth becomes non-vital. Infection can easily set in and the infection can spread through the root ends (*apex*). The destruction of tooth structure will worsen without proper intervention. When the affected tooth is severely broken down, restoration may no longer be possible. The removal (*extraction*) of the tooth may become the only way out which results in tooth loss.

Figure 1.1  
Sectional view of a healthy tooth

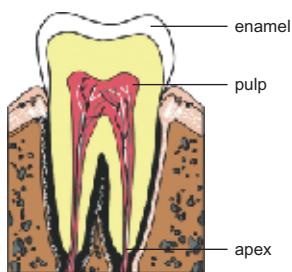


Figure 1.2  
Diagrammatic illustration of progression of tooth decay

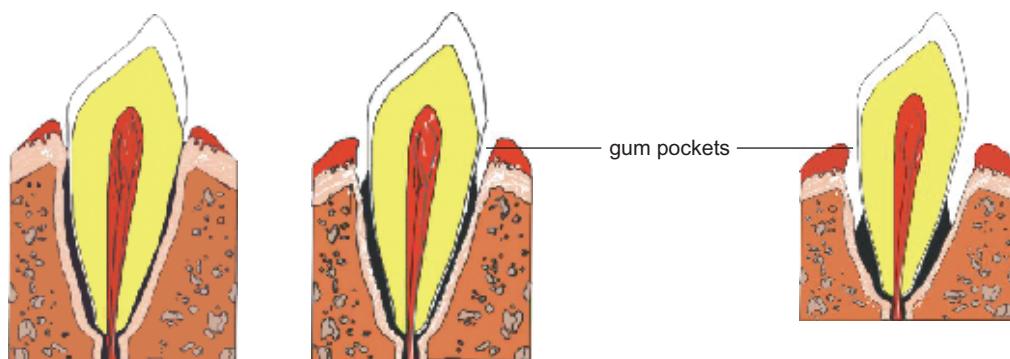


## What is gum disease ?

Gum disease is a chronic disease of the supporting tissue around the teeth which include the gums, bone and connective tissue. Dental plaque is also the culprit of gum disease. If teeth are not effectively cleaned, dental plaque will accumulate on the tooth surfaces and crevices along gum margins. Furthermore, accumulated dental plaque may calcify into a hardened deposit called calculus. The rough surfaces of the calculus further promote plaque accumulation, thus hastening the progress of gum disease.

The bacteria in the dental plaque release toxins which irritate the gum tissue it comes in contact with, leading to gum inflammation, a condition which is still reversible. However, if left untreated, gum inflammation may progress further and affect the tooth's supporting tissue. It is manifested when the gums, which originally were tightly attached to the root surfaces, will detach, leading either to the formation of gum (*periodontal*) pockets (Figure 1.3) or recession of the gum margins, or both. The total detachment of tooth support, including both gum pocket and gum recession, is referred to as the loss of attachment (LOA), a condition which is now irreversible.

**Figure 1.3**  
Diagrammatic illustration of progression of gum disease



Gum pocket is significant because the affected person cannot clean the inside of the pocket, and can only be managed by professional care. Shallow pocket refers to pocket depth (measured from gum margin to the base of the gum sulcus) of 4 to 5 mm, and deep pocket refers to pocket depth of  $\geq 6$  mm. The deeper the gum pocket, the more complex professional treatment is required.

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While healthy gums appear pink and firmly attached to tooth, inflamed gums appear swollen and bleed easily when touched or brushed. Gum inflammation is the mildest form of gum disease. There is usually little or no discomfort aside from gum bleeding. The loss of attachment in the form of gum pocket can hardly be perceived by the affected person. The loss of attachment in the form of recession, leads to the exposure of root surface and sensitivity. The affected person may soon notice an "elongation" of the tooth because of the gum recession and exposure of the root, which make the tooth appear longer but in fact is a manifestation that the tooth support has been destroyed thus exposing more of the tooth and root surface.

Accumulation and maturation of dental plaque in gum pockets may lead to more severe forms of inflammation, pus formation along the gum margin, and abscess formation. Foul smelling breath is also common in such situations. Persistent gum inflammation will lead to the destruction of bone support of the affected tooth. The affected tooth may drift away from its original position and may become loose (mobile). Without proper intervention, the supporting tissues may be completely destroyed and make the affected tooth very loose, and may even fall out easily.