

## COMMON DENTAL CONDITIONS IN ADULTS

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**ABSTRACT**

**Dental caries and periodontal disease are the two most common dental conditions which afflict the general adult population. Dental caries presents with several common signs and symptoms which include sensitivity or pain to hot and/or cold foods, pain while chewing, exudate, swelling, and/or other signs of inflammation. Common signs and symptoms of periodontal diseases include redness and swelling of gingiva, malodour, exudate, bleeding while brushing, tooth looking longer than normal, increased mobility of teeth, and pain. The Common Risk Factor Approach prevents dental caries and periodontal disease. One of the most significant risk factors for periodontal disease is cigarette smoking. Diabetes Mellitus, AIDS and pregnancy, are also associated with periodontitis.**

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**INTRODUCTION**

Oral health confers many benefits including mastication, speech, appearance and even self-esteem to individuals. Increasingly, oral health is recognised as being an integral part of an individual's overall health and wellbeing. It is therefore important to maintain good oral health as one progresses through life and especially during adulthood. This article highlights the aetiology, signs and symptoms as well as management of the two most common dental conditions which afflict the general adult population – dental caries and periodontal disease. These two diseases are preventable and the Common Risk Factor Approach can be employed to prevent their onset.

**DENTAL CARIES**

While the prevalence of dental caries (tooth decay) in childhood may vary among communities, it is usually higher among the younger age groups (Gao, Hsu et al. 2009; Nair 2010)<sup>6,10</sup>. However, dental caries also continues to plague individuals in adulthood.

Dental caries can mean a number of things. Firstly, it can be on the enamel on the commonly exposed parts (crown) of the teeth, or on the dentine, or on the roots, after the thin layer of cementum is worn off (Figure 1).

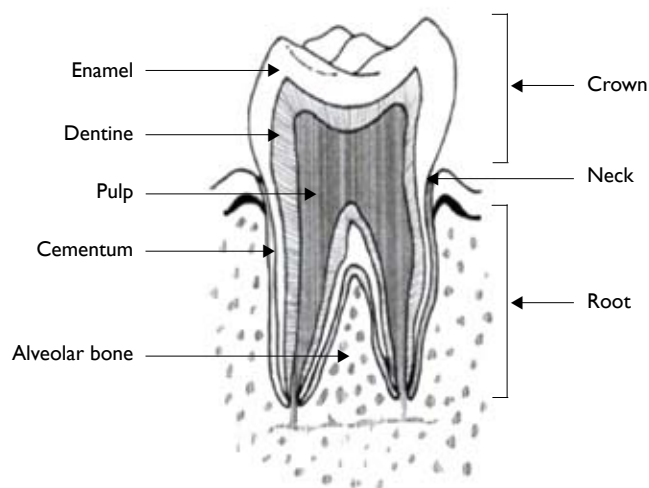


Figure 1. Parts of a Tooth

Dental plaque is a soft material which forms around the teeth and is made up of saliva, partially digested food, bacteria and bacterial by-products. Bacteria in dental plaque convert sugars in the mouth to acids which dissolve the mineral of enamel. In its initial stages, dental caries may resemble a white patch (pre-cavitation) commonly found along the gumline or on the grooves of teeth where food and bacterial biofilm are commonly visible (Fejerskov and Kidd 2008)<sup>5</sup>. Then it progresses to loss of tooth material and presents with varying degrees of cavitation eventually resulting in loss of tooth structure. While in the enamel, the lesion is usually more extensive towards the inside than the outside. The visible opening of the cavitation thus lends a deceptive impression of the extent of the cavitation inside. It is important to detect dental caries early in its pre-cavitation stage as that part of the tooth can be remineralised if given a chance.

On the roots, the lesion may begin as a lighter or darker region and usually progresses to become a dark area with varying depths, depending on the extent of the lesion. Dental caries on the root surface usually presents with a scooped out appearance.

Dental caries presents with several common signs and symptoms. These include sensitivity or pain to hot and/or cold foods. For more extensive lesions, there can be pain while chewing; exudates; swelling and/or other signs of inflammation. It may also be difficult for the patient to localise the sensitivity or pain to a single tooth.

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## Management

Management of dental caries involves removal of the carious portions of the tooth and replacement of the lost tooth structure with a restoration (filling). Sometimes, if the caries is extensive with significant loss of tooth structure, the tooth may need to be extracted and replaced with a prosthesis. More information on the management of tooth loss will be addressed in Units 5 and 6.

## Prevention

### Fluoride

Fluoride is a very important caries-protective agent. Its wide and effective use is one of the great success stories in preventive medicine. Singapore's water supply is fluoridated to 0.4ppm (parts per million) to 0.6ppm and it is the most important dietary vehicle for fluorides. From a global public health perspective, the addition of fluoride to toothpastes is the single most effective method of topical caries prevention. The fluoride concentration in most adult toothpaste is about 1,200ppm but specially formulated toothpastes with fluoride concentrations of 1,500ppm – 2,000ppm are recommended for caries-prone and xerostomic patients. Other ways of applying fluoride therapeutically include mouth rinses, gels, and varnishes. The choice of fluoride concentration and mode of delivery in fluoride therapy will depend on the pattern of caries development and patient compliance issues.

### Sugar substitutes

Sugars play a predominant role in the aetiology of dental caries. The use non-sugar sweeteners in place of the more cariogenic types has been researched extensively. Non-sugar substitutes broadly categorised into bulk and intense sweeteners are now widely used in confectionery, chewing gum, liquid medicines, soft drinks and toothpastes. The dental benefits of non-sugar sweeteners such as xylitol are well-established and studies have shown that an adequate dosage of xylitol can shift the bacterial flora in the mouth and reduce caries incidence and usage (Ly, Riedy et al. 2008; Milgrom, Ly et al. 2009)<sup>8,9</sup>.

Chewing sugarless gum helps prevent dental caries by encouraging remineralisation of very early carious lesions through increased salivary flow. Studies have shown a dose-response relationship where chewing gum 5 times per day is more effective than 3 times daily.

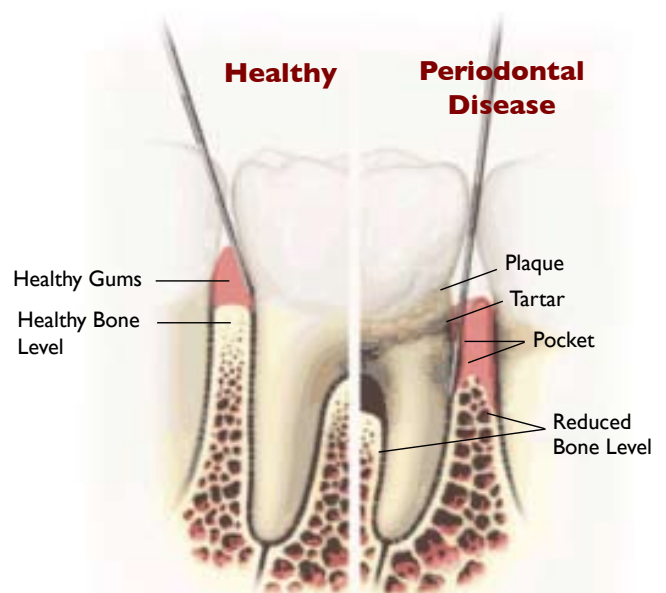
### Milk and dairy products

Various components in milk have been considered to be protective against dental caries, mainly the minerals, casein, and other lipid and protein components. Not only is lactose the least cariogenic of the common dietary sugars, the high concentrations of calcium and phosphorus in milk also helps to prevent dissolution of enamel. Studies have shown that supplementation of a cariogenic diet with cow's milk

substantially reduced dental caries and this was not due to a reduced consumption of the cariogenic diet. As such, milk may be a non-cariogenic alternative suitable for use as artificial saliva in caries-prone and xerostomic patients who are not lactose intolerant.

## PERIODONTAL DISEASE

The periodontium consists of structures that support teeth in their position in the mouth. These include the alveolar bone, periodontal ligament, gingiva (gums), and cementum (Armitage 2003)<sup>2</sup> (Figure 1). In a healthy mouth, the gingiva surrounds the teeth like a pair of well fitting socks. There is a small gap (crevice) between the tooth and gingiva and that little gingival crevice should be barely detectable and definitely less than 3mm in depth. In disease, this crevice can become as deep as 10mm and the tooth often feels loose or 'weak' (Figure 2).



**Figure 2. Healthy gingiva and Periodontal Disease**

Prolonged accumulation of dental plaque in this crevice initiates a host-mediated destruction of soft tissue caused by hyperactive leukocytes, cytokines, eicosanoids and bacterial by-products which irritate the gingiva. This in turn causes irreversible resorption of the surrounding bone supporting the teeth resulting in drifting, mobility and eventually loss of the teeth. This process often happens over a long period of time and may take 10 – 20 years before a tooth becomes loose or starts to drift out of its position in the jaw.

The two major diseases that affect the periodontium are gingivitis and periodontitis. Gingivitis is the inflammation of the gingival tissue, and is usually associated with bacterial biofilm (plaque) or systemic conditions. Periodontitis involves loss of support to the tooth from the periodontium.

Gingivitis is almost always present in most age groups and in most countries (Burt 2005)<sup>3</sup>. Adolescents usually present with bleeding on probing and calculus. Due to its slowly advancing nature it is seldom detected until it is too late. Loss of periodontal support as evidenced by periodontal pocket depths of 4-5 mm is seen in a majority in this group. Among adults, complete absence of periodontal disease is uncommon. When examining the reasons for extraction of teeth, it was seen that periodontal disease was one of the common reasons, and the instances increased with age (Ong, Yeo et al. 1996)<sup>12</sup>.

Common signs and symptoms of periodontal disease include redness and swelling of the gingiva; malodour; exudates; bleeding while brushing; teeth looking longer than normal; increased mobility of teeth and pain.

### Management

Management of periodontal disease involves removing the tartar beneath the gingival and rigorous oral hygiene maintenance on the patient's part.

### Prevention

Good oral hygiene through regular toothbrushing and dental flossing at home is key in removing dental plaque to prevent irritation to the gingival tissues. Regular dental check-ups will also allow for assessing the need for professional cleaning.

## COMMON RISK FACTOR APPROACH TO DISEASE PREVENTION

Traditionally, the prevention of diseases has centred around specific risk factors for specific diseases, but we may not need to put a great deal of additional effort to make significant difference in the prevention of oral diseases (Sheiham and Watt 2000)<sup>14</sup>. Instead, we can target a number of risk factors that are common for several diseases of interest (Figure 3).

So, by targeting a small set of risk factors that are important for a large number of diseases, there is greater effectiveness and lower cost and burden. Under this common risk factor approach, a general medical practitioner can play an important and effective role in the prevention of common oral diseases for most age groups.

One of the most significant risk factors for periodontal disease is cigarette smoking (AAP 1999). Besides periodontitis, it is related to a variety of medical problems such as cancer, pulmonary and cardiovascular diseases. Smoking is related to the development and progression of periodontal diseases. Smoking alters the immune response to infections and may also alter the bacteria that are present in the periodontal pockets. In previous studies, there was a relationship between smoking and destructive periodontal disease. While measuring the amount of loss of support provided by the alveolar bone, significant differences were noted between those who have never smoked and current smokers. This difference between the two groups

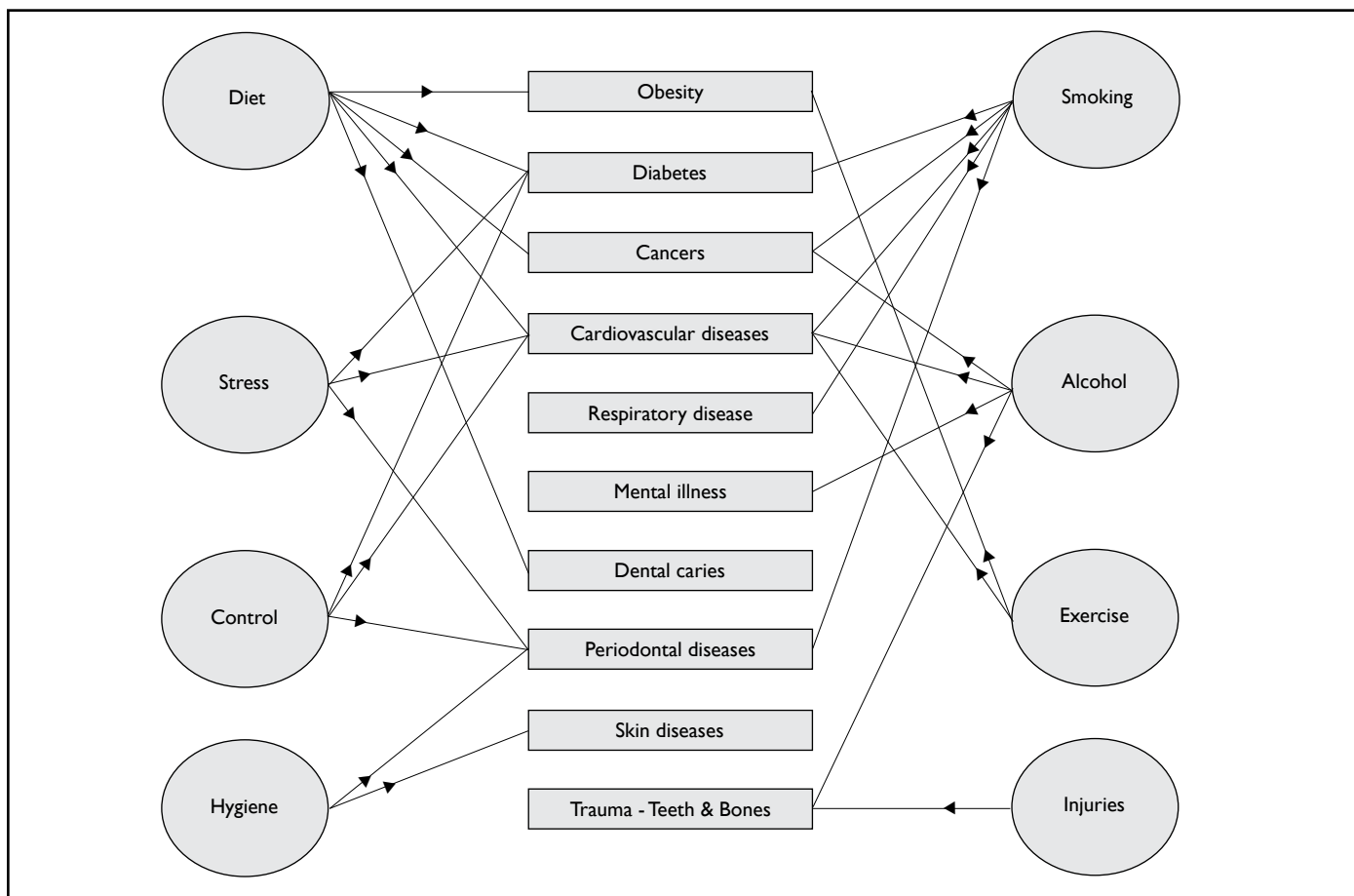


Figure 3. The Common Risk Factor Approach (Sheiham and Watt 2000)<sup>14</sup>

increased with age. Smokers may also present with decreased signs of clinical inflammation in their periodontium.

Diabetes mellitus, AIDS and pregnancy are also associated with increased periodontal destruction (Lim, Leo et al. 2001; Burt 2005)<sup>7,3</sup>. These instances require greater attention for periodontal health.

Besides control of smoking, and increased care for sections of populations that are at an increased risk, hygiene of the oral cavity is very important. For a majority of the population, good oral hygiene may help reduce the occurrence and burden of periodontal disease. The improved oral hygiene can also help reduce the risk of dental caries. Basic components of oral hygiene include brushing teeth adequately twice a day (once in the morning and once before sleeping at night) with fluoridated toothpaste, and flossing at least once a day.

Diet is another factor that is important for many of the diseases that are of importance to health care (Sheiham and Watt 2000)<sup>14</sup>. Among the oral diseases, dental caries has the strongest link to dietary habits. The total amount of sugars consumed by an individual has been found to be the most important dietary factor for the risk for dental caries. Helping patients choose a balanced diet devoid of excess sugars can make a difference in reducing the risk of dental caries, and other systemic diseases.

## CONCLUSION

The general medical practitioner plays a pivotal role in the healthcare system and can effectively facilitate the prevention of several common oral diseases. They are in the best position to identify and target some of the major risk factors such as smoking, diet, hygiene, and other systemic conditions that pose a risk for many oral and systemic diseases.

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## LEARNING POINTS

- **Dental caries presents with several common signs and symptoms which include sensitivity or pain to hot and/or cold foods, pain while chewing, exudate, swelling, and/or other signs of inflammation.**
- **Common signs and symptoms of periodontal diseases include redness and swelling of gingiva, malodour, exudate, bleeding while brushing, tooth looking longer than normal, increased mobility of teeth, and pain.**
- **The Common Risk Factor Approach prevents dental caries and periodontal disease.**
- **One of the most significant risk factors for periodontal disease is cigarette smoking.**
- **Diabetes Mellitus, AIDS and pregnancy, are also associated with periodontitis.**