Caries

YOUNG ADULT – A PERSON AT HIGH CARIES RISK?

Is there a problem?

It is documented that caries experience increases across older age groups (National Oral Health Survey Australia, 1987-88). However, caries initiation and progression for different age groups varies and is very specific for the adolescent/young adults group.

For instance, the Young Adults Study carried out in Adelaide found a mean DMFT of 3.7 in 20-24 year olds in Adelaide in 1999. The DMFT in young adults was found to be even greater amongst those who attended publicly funded dental clinics in South Australia in 1995-6 (Figure 1). However, it needs to be remembered that not everyone in this age group experiences caries at the same rate. The Young Adults Study found that 21% of adults aged 20-24 years had no caries experience, but close to 14% had eight or more teeth with decay experience. The observed difference in oral health between 12 year olds and young adults in Australia suggests deterioration in oral health, as adolescents become young adults.

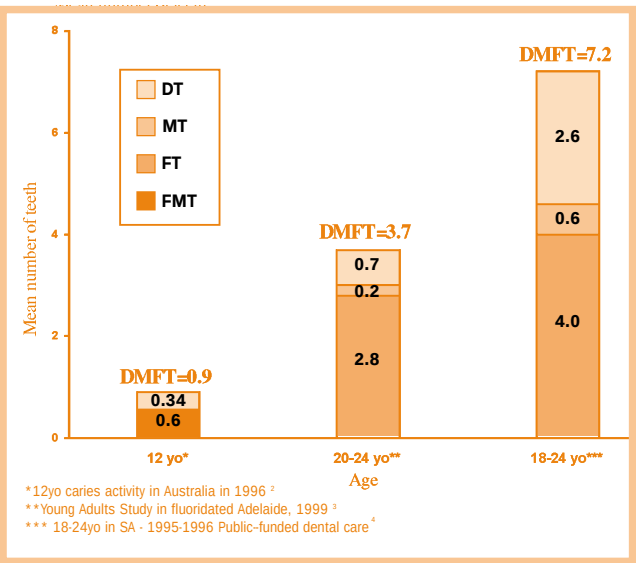


Figure 1 DMFT in young adults in South Australia.

Why does this problem exist?

The level of caries experience illustrated above for the young adult age group occurred even when the young adults had potentially been exposed to preventive measures, such as water fluoridation and fluoride toothpaste, throughout all their lives. A number of explanations have been put forward, but no single factor appears to predominate.

- Young adults are subjected to many changes in life. Leaving school, getting a job or leaving home to live independently can result in significant lifestyle changes that impact on diet or oral hygiene practices. Living on fast food, lack of regular meals, frequent snacking and less frequent use of toothpaste are typical for many young adults. Fast foods often contain high amounts of hidden sugars. Many of the more popular beverages are high in sugar and very acidic. Altered oral hygiene practices often result in lowered use of toothpaste and diminished exposure to fluoride.
- It is known that optimal levels of fluoride stop the initiation or slow the progression of decay down, but the decay process is able to progress rapidly once the cariogenic challenge increases. In some cases, caries can progress into dentine without being visually obvious during oral examination ('fluoride bomb').
- The School Dental Service encourages students to continue with regular dental care after leaving school. Further, parents of children also consider it desirable to maintain a regular dental visiting pattern. However, many school leavers do not seek dental care for a number of years. This has been described as the discontinuance problem (Spencer and Brown, 1986).

Despite adequate pre- and post-eruptive exposure to fluoride in childhood and leaving school with good dental health, the increased caries challenge at a time when post-eruptive exposure to fluoride is lowered can exceed the capacity for remineralisation and caries occurs.

The contributing factors.

i. FLUORIDE EXPOSURE

Many young people are born and live in fluoridated areas most of their lives and start using toothpaste with fluoride around the age of two years. That level of **pre-eruptive fluoride exposure** resulted in the development of teeth with an adequate amount of fluoride built into their structure. A stable and sufficient exposure level usually continues on until teenage years when lifestyle changes may have a negative influence on toothbrushing and **post-eruptive exposure** to fluoride. There are a variety of reasons behind the decreased frequency of toothbrushing, and they need to be understood and carefully assessed for each individual patient.

The healthy trend to drink plenty of water has resulted in the consumption of bottled waters. **Bottled waters** vary in fluoride content with many being very low. In fluoridated areas, frequent use of bottled instead of tap water may considerably lower the total daily exposure to fluoride.

Consumption of **soft drinks** by young adults is also high. Although many soft drinks are manufactured in fluoridated areas and contain an adequate level of fluoride some are manufactured using water low in fluoride. Other problems associated with frequent consumption of soft drinks which have a high concentration of sugar and a high acidity are discussed in other sections of this practice information sheet.

ii. DIETARY

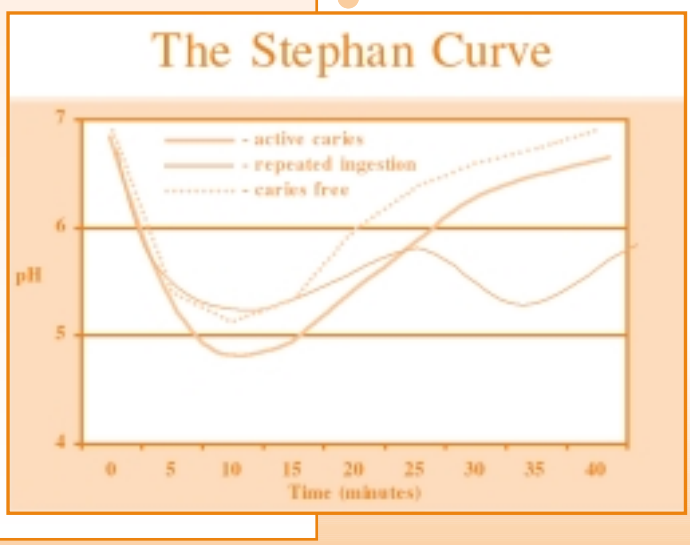
- irregular main meals / skipping main meals

Many young adults do not eat regular homemade meals. They have developed a habit of relying on a variety of fast food that are often high in sugar. The lack of proper main meals may result in frequent hunger and a 'grazing' eating pattern where an individual eats small amounts of a variety of food all day long. This eating pattern often does not leave enough time for teeth to recover from acid attack and for remineralization to occur.

- frequent consumption of sugary snacks or drinks

The damaging effect of frequent sugary snacks and the need to balance demineralization with remineralization are well understood by dental professionals. High consumption of soft drinks by young adults is well documented (Lytle et al. 2000), and recently another type of drink – the designer drinks – is also becoming popular.

Soft drinks are both very sweet and acidic. Although the 'diet' forms of soft drinks are considered a 'tooth friendlier' alternative, they are very acidic (Taji et al, 1999). They contain citric and phosphoric acids that are able to overwhelm fluoride protection on teeth. Unfortunately little research has been done in this area and until more research is available clinicians must rely on a common sense approach in their recommendations.



Many young adults (albeit less than is desirable) are involved in a variety of sporting activities. Often such activity is associated with drinking plenty of liquids. Most of the available sports drinks contain sugar as a main source of energy and the pH of these drinks is very low. Many people believe that if a drink is called a "sport" drink that means it is designed to be used by people playing sport, therefore, it must be healthy. Unfortunately in the majority of cases this is not so.

Obtaining information on all dietary issues are important steps in identifying the factors contributing to caries development in young adults.

iii. MEDICAL CONDITIONS AND SALIVARY FLOW

The majority of young adults are fit and healthy and not taking any prescription medications. However, smoking and, in recent times, increasing use of 'recreational' drugs may influence the flow rate and buffering capacity of saliva.

Prolonged sporting activity can lead to dehydration, which results in marked decrease in salivary protection (Saliva and dental health, 1996). The damage to teeth will increase greatly if 'sports' drinks are consumed over prolonged periods to counteract the dehydration.

Assessment of salivary factors is not difficult to carry out, but if salivary flow is found to be low a clinician needs to be aware that decreased salivary protection may be intermittent. Information on a patient's salivary protection greatly assists the dental practitioner to devise a more effective management plan.

iv. Oral hygiene can be a major contributing factor mainly due to appropriateness of exposure to fluoride from toothpaste discussed earlier.

Periodontal health, particularly gingival inflammation, may provide an indication whether brushing habits are adequate, but it does not provide information on the type of toothpaste used (fluoridated or non-fluoridated).

Oral examination and beyond for young adults

Effective management of caries in young adults is dependent on;

- Accurate diagnosis of caries and its causes
- Development of an effective control program, which is well-accepted by the patient
- Quality treatment, especially in terms of emphasis on prevention and approaches that build confidence with the outcome of long-term care
- Acceptance by the patient of the need for a long-term program of maintenance

Accurate diagnosis of presence and causes of caries

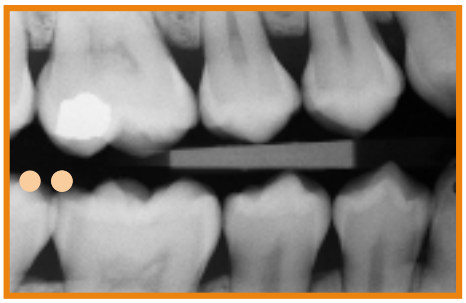
Oral examination:

- Ensure visual detection of all incipient lesions cervically as well as in pits and fissures and approximally.
- Bitewing radiography is essential following long periods of non-attendance at a dental clinic.
- Assess the activity status of any caries where feasible, i.e., whether it is active or arrested. This will help to determine caries severity and urgency of control measures.
- Salivary protection - where appropriate - can be assessed by
  - i. measuring stimulated salivary flow rate
  - ii. measuring buffering capacity.

Examination of causes:

Besides oral examination, two other issues are critical to the successful outcome of dental care: to establish causes and to understand patient behaviour. Previous practice information sheets have addressed these issues in detail.

Preventive oriented clinicians cannot limit a patient's examination to just oral examination. Using oral examination alone as a diagnostic tool leads to a 'fill and drill' approach, which does not manage caries and does not result in long-term oral health. Even the most thorough oral examination, although very important, will never allow a practitioner to identify the causes of caries activity. Without that basic knowledge, treatment plans will not result in long-term success.



Lacking understanding of patient behaviour issues may result in the failure of prescribed fluoride treatments. Fluoride has well-proven clinical efficacy. However, fluoride will only work if a patient is prepared to use fluoride as prescribed. It is not realistic to expect someone who forgets to brush daily to remember to use a fluoride rinse, or to expect someone who is not motivated to spend more money on oral care products.

Taking thorough dental and medical histories will point to contributing factors. Looking into the patient's past dental experience may reveal frequent replacement of restorations or 'holes in teeth' found on past dental examinations. This finding suggests that the risk factors or behaviours are well established. Careful examination of the current causes of caries is important as current causes may be masked by well-established bad habits.

The dental history may also reveal the kind of preventive approaches other clinicians have attempted and why those approaches have failed. Information gained helps to develop a treatment plan that will avoid the downside of previous treatment plans and lead to successful outcome.

Development of an effective control programme, which is acceptable to the patient

This is a complex aspect of management. It is essential to involve the individual in the decision making process. Young adults may reject any recommendations that appear to threaten a very active and free lifestyle. For example, suggesting more regular eating patterns with less snacking and reduced soft drink consumption may not seem realistic in the mind of a young adult. Outlining the main causes of the caries problem and asking the young adult how he/she would prefer to manage the causes is more likely to result in control measures being adopted. It is important to remember that incremental behavioural change may prove more sustainable than radical change.

In most cases the objectives to be achieved are:

- Reductions in frequency of acidic beverages and highly sugared snacks:
- Progressive replacement of acidic beverages and highly sugared snacks with acceptable alternatives; and
- Appropriate increased fluoride exposure.

As it may take some time to control dietary factors, it will usually be necessary to implement an appropriate increase in fluoride exposure. The form and frequency of fluoride to be recommended will depend on the individual patient's current level of fluoride use, the severity of the caries challenge and the patient's willingness and ability to use additional fluorides. A good place to start is by assessing daily toothbrushing habits.

Frequently, patients claim that they brush their teeth twice a day. On closer questioning, it can be learnt that they often skip brushing at night because they go to bed late, sleep over at a friend's place, or for some other reason. Although the importance of night time and regular brushing should be explained to the individual, it may be more productive to give them some options for applying fluoride if they are in a situation in which they can't brush. One such alternative is to put a bit of toothpaste on a finger, smear it on the teeth and leave it without rinsing. This type of advice has an additional lifestyle bonus of freshening the breath that young people may like and easily accept. During discussion, patients usually come up with other options that may be more suitable for them and their lifestyle.

To successfully encourage a young adult to brush twice a day may be difficult but establishing more effective brushing habits is a first and critical step to long-term success. When taking into consideration all the brushing issues, it may be wise to recommend using high-fluoride toothpaste (5000 ppm) instead of regular toothpaste. This type of advice causes the least interruption to the patient's behaviour, but has the potential to significantly increase fluoride exposure.

For those young adults who are motivated and interested in putting their oral health back on track, daily home use of concentrated fluoride gels may be recommended. For patients with a moderate caries challenge, daily fluoride mouthrinses (0.2% NaF) would also be appropriate.

It usually takes a few months of compliance with fluoride therapy and dietary changes before evidence of control of caries activity can be observed intra-orally. When this is evident through remineralisation of incipient lesions or of any remaining exposed dentine, the frequency and concentration of fluoride may be progressively reduced to that considered necessary as a maintenance dose.

Once restorative treatment is complete, a maintenance schedule of fluoride use needs to be established taking into account the probable continuing moderate to high caries risk situation for that patient.

Quality treatment

When treating young adult patients a dental professional is interacting with them at a critical stage of their oral health history. Perceptions of under- or over-treatment, or experience of restorations of poor aesthetic quality or with a short life span may affect a young adult's confidence in the profession for the remainder of his/her life. Restorative treatment without adequate advice and assistance with prevention may result in restorative failures and a continuing caries problem. This may cause loss of confidence and reluctance to continue dental care.

Need for a long-term program of maintenance

An essential part of successful management of a caries problem is helping the patient to recognise the need for continuing monitoring and maintenance. The frequency of recommended continuing care appointments will depend on how well and how quickly a patient adopts new healthier habits and on the clinician's assessment of continuing risk. For caries control in a patient who presented initially with rampant caries, effective monitoring may require short review appointments at three-month intervals for the first six months to one year. Where caries control is successfully maintained over this time, the intervals can be safely extended to six months and then yearly. Where the caries risk is low to moderate, yearly reviews may be justified.

Erosive conditions of interest for young adults

Eating disorders can result in rapid, advanced dental breakdown (Jones and Cleaton-Jones, 1989), and it may seem impossible to help individuals with eating disorders to avert damage to their dentition. Patients with eating disorders usually do not perceive themselves as experiencing an eating problem. This makes it essential that a dental clinician is able to recognise the oral symptoms of the problem.

In managing this condition, it is important to protect teeth against erosive and cariogenic damage while the patient is trying to gain control over the eating disorder. This may involve placement of resin restorations on affected surfaces, or, if necessary, placing layers of unfilled resin on vulnerable surfaces. It may help to explain to the patient that teeth show signs of strong acidic damage and to show the individual the signs in his/her mouth. Advise the patient that if he/she experiences a sour taste at any time, to rinse with water or a fluoride mouth rinse immediately. Although, at this stage, very little research has been done in this area and results are contradictory, it is suggested that patients should be discouraged from brushing teeth while enamel is softened.

Eating disorders present with unique patterns of psychological, medical, and dental characteristics. Appropriate dental treatment is based on the multidisciplinary facets of these conditions. The dental team should be mindful that individuals who suffer from these disorders might relapse into previous negative eating behaviours. The knowledgeable dental professional may be able to intercept these habits through regular recall intervals and thorough examination (Studen-Pavlovich and Elliott, 2001).

Those with **severe endogenous erosion** are usually fully aware of the presence of gastric reflux in their mouths frequently, and will most likely have already consulted a physician and be on medication to control it. Where there is an associated high caries risk, any early lesions will progress quickly to cavitation stage. Where erosion persists, the role of the dental professional is to help protect teeth against the erosive damage, in the same ways described for patients with eating disorders.

Gastric reflux may also occur during pregnancy. It is important to discuss the severity of the problem with the patient and if necessary recommend regular fluoride mouth rinses.

References

1. National Oral Health Survey Australia 1987-88. P Barnard, ed. Canberra. Australian Government Publishing Services, 1993.
2. Child Dental Health Survey, Australia, 1996. Adelaide AIHW Dental Statistics and Research Unit The University of Adelaide, 1999; Dental Statistics Series Number 20.
3. Oral Health and Access to Dental Care of Young South Australian Adults. Adelaide AIHW Dental Statistics and Research Unit Research Report, August 2000.
4. Oral Health of Public-funded Dental Patients; Adelaide AIHW Dental Statistics and Research Unit The University of Adelaide; Newsletter Vol VIII, No 1, Feb 1997.
5. How do children's eating patterns and food choices change over time? Results from a cohort study. Lytle LA, Seifert S, Greenstein J, McGovern P. Am J Health Promot. 2000;14(4):222-8.
6. High Caries Risk Clinic Report. JM McIntyre, M Blackmore. Adelaide; Department of Dentistry, The University of Adelaide, 1992.
7. Saliva and Dental Health. Edgar WM, O'Mullane DM, Eds, 2nd ed. London, Br Dent J, 1996.
8. Electron probe micro-analysis of surface mineral changes in dental enamel produced by acidic soft drinks. Taji SS, Hunt D, McIntyre J. Aust Dent J 1999;44:S19.
9. Depth and area of dental erosions and dental caries in bulimic women. Jones RR , Cleaton-Jones P. J Dent Res 1989;68: 1275-8.
10. Transition from school-based to community-based dental services. Spencer AJ, Brown D F. Community-Health-Stud. 1986; 10(1): 12-8
11. Eating disorders in women's oral health. Studen-Pavlovich D, Elliott MA. Dent Clin North Am 2001;45:491-511.

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