



FACT SHEET

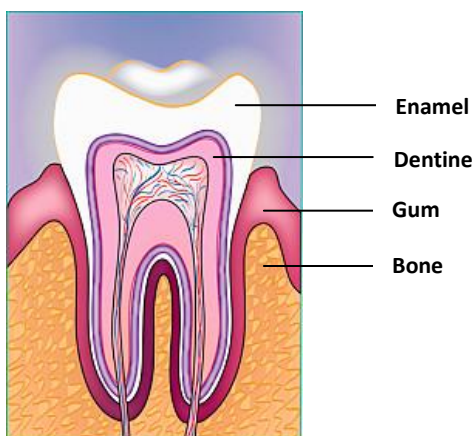
Dental Health for Athletes

Why worry about dental health?

As an athlete, the dedication of training, eating well, staying hydrated and meeting nutritional goals have one main aim: improving performance. Athletes consult with their sports physicians and physiotherapists for physical health, their sports dietitian for a performance nutrition edge, but dental health is often seen as a much lesser priority. But while dental health may not affect your day-to-day on-field performance, or win you this year's Best & Fairest, the consequences of poor dental hygiene are likely to catch up with you sooner or later in life.

Sports products, including carbohydrate gels and sports drinks have been shown to improve performance and time to fatigue, but these products need to be used carefully or you may be forced to reconsider your smile and probably your bank account! Dental professionals have been concerned for some time about an increasing incidence of dental problems amongst sports participants and increasing rates of tooth wear (the loss of dental hard tissue) which affects all ages from pre-school children through to adults.

The outer surface of a tooth is susceptible to acidity which can result in dental decay, dental erosion or both. Dental erosion occurs when the hard, outer covering of teeth (tooth enamel) softens exposing the softer, underlying tooth material (dentine) to abrasion thereafter¹. An Australian survey in 2007 found nearly 70% of 714 students aged 6-15 years in eight schools had at least one tooth with excessive wear². The increased rate of erosion has been linked to increased consumption of dietary acidic intake particularly soft drinks, fruit juices and sports drinks.



What causes dental erosion?

There are several factors that can cause dental erosion when training or competing.

1. **The acidity of food/fluids:** tooth enamel is composed of minerals, such as calcium and phosphate. Both enamel and dentine are weakened and dissolved by acid (pH less than 5.5). The enamel layer in primary teeth (the first set of teeth in children) is thinner making them particularly vulnerable. In commercially available sports drinks, the pH is 2.4 - 4.5 and hence the concern about damage to teeth.
2. **The frequency and duration of exposure to acidic products:** salivary flow neutralises acids and provides calcium and phosphate to remineralise tooth enamel within a 20-30min "recovery" phase. Frequent sipping of sports drinks/soft drinks increases the length of this recovery phase extending the time in which teeth are 'vulnerable' to erosion.
3. **The sugar content:** Cola drinks, sports drinks, gels and energy drinks (and any other type of food which may be "sticky" e.g. honey, glucose syrup, etc) are sources of carbohydrate in the form of sugar for the purpose of easy digestibility and delivery to working muscles. However, these foods provide sugar in a form that adheres to teeth more than saliva and provide a substrate for additional acid production by oral bacteria.
4. **Decreased salivary flow:** Saliva plays a vital role in protecting teeth. It dilutes and clears liquids at the tooth surface. It neutralises acids in the mouth and provides a mineral source including calcium and phosphate for remineralisation (enamel hardening). Dehydration is a real issue for many athletes, particularly when exercising in the heat, for extended periods and especially for those with a higher-than-average sweat rate. Dehydration causes the mouth to become dry, reducing salivary flow which increases the time of tooth surface damage.

1. Young G. The oral medicine of tooth wear. Australian Dental Journal 2001; 46; 236-250

2. Kazoullis S, Seow WK, Holcombe T, Newman B, Ford D. Common dental conditions associated with dental erosion in school children in Australia. Paediatric Dentistry 2007; 29; 33-39.

Signs of dental erosion

Signs of dental erosion include:

- Hollow defects on the cusp tips/loss of surface detail on the chewing surfaces of posterior teeth
- Fillings in affected teeth appear to “stick out” of the tooth surface due to surrounding tooth structure being dissolved
- Thinning/chipping of the biting (incisal) edges of the anterior teeth
- Thinned outer enamel layer of affected teeth so underlying grey/brown tooth colour is more noticeable
- Tooth sensitivity to hot/cold or sweet for duration of contact with affected tooth surface

Common Mouth Myths

The “Water Chaser”

A mouthful of water following a mouthful of sports drink (also called a “water chaser”) does not prevent dental erosion. Water can help to flush some of the solution away but acid neutralisation or remineralisation cannot occur as water contains no bicarbonate, calcium or phosphate.

Brushing makes it OK

Brushing teeth within 30 minutes of consuming sports drink can cause further damage as tooth surface is still soft. The frequent use of highly abrasive toothpastes particularly within 30 minutes of sports drink consumption (e.g. whitening toothpaste) by some health/aesthetic conscious individuals may also result in the removal of the outer layer of tooth enamel³.

Liquids with pH less than 5.5:

pH range

- | | |
|--|-----------|
| • sports drinks, energy drinks | 2.4 - 4.5 |
| • commercial fruit juices | 3.4 - 3.6 |
| • carbonated mineral water and soft drinks | 2.5 - 3.6 |

Minimising dental problems

For children and low intensity sports

- Tap water is appropriate for maintaining hydration
- If sports drinks are required for prolonged exercise periods or exercise in the heat, precautions should be taken to minimise dental damage. Dental products such as tooth mousse can help to protect teeth and foods rich in calcium and phosphate (like milk, cheese and yoghurt) can help to remineralise the tooth surface.

3. Amaechi BT, Higham SM. Dental erosion: possible approaches to prevention and control. Journal of Dentistry 2005; 33; 243-252.

Minimising dental problems

For higher intensity and/or prolonged exercise

- When sports drinks or de-gassed cola drinks are required, these fluids should be used carefully by athletes.
- A water chaser after a sports drink does not protect teeth. Water does not neutralize acidic beverages (as it contains no bicarbonate) nor remineralise tooth surface. However, water will help to clear the acidic beverage from the mouth and aid salivary flow through rehydration.
- Use neutralising products, fluoride varnishes, gels or rinses, remineralising agents such as CPP-ACP added to chewing gum, lozenges, mouthwashes or milk to re-harden tooth surfaces. Fluoride, bicarbonate and calcium can also be added to sports/soft drinks to reduce their erosive potential but may also affect the taste and palatability.

Other tips

- When preparing sports drinks from powders, make them up correctly! Less water than specified will change the concentration of the sugar which may lead to a more syrupy beverage and may also cause gastrointestinal distress.
- Swallow acidic drinks immediately – do not hold or swish them in your mouth. Drinking acidic beverages via a straw (where possible) also reduces contact with teeth.
- Do not use sports drinks as a mouthwash! Do not rinse your mouth with sports drink before inserting your mouth guard.
- Mouth guards should only be rinsed in water.
- When using carbohydrate gels, drink water instead of sports drinks. As a general rule, aim to consume 400mL for every 1 gel as this helps to minimise gut disturbances by diluting the concentrated sugar content.
- Avoid dehydration and rehydrate quickly during recovery. When dehydrated and consuming several high glycaemic index foods to meet recovery goals, the risk of dental decay from reduced salivary flow is higher. So recognise how much fluid you have lost (via pre- and post-exercise weight) and rehydrate well! For more information on fluids and recovery, see the SDA fact sheets on [Eating and drinking during and after sport](#) and [Fluids in Sport](#).
- Brushing teeth should be delayed for at least 30 minutes after consuming a sports drink or post-exercise recovery to enable the tooth surface to re-harden.
- Do not consume acidic foods or beverages immediately before bed.
- Discuss your training and hydration regime with your dental professional. Regular dental review will detect early damage.

SDA would like to acknowledge John Banky, Dental Surgeon (ADA, SMA) for his contributions in producing this fact sheet.