

Editorial

This issue of Heinz Sight focuses on 2 important dental issues – dental erosion and fluoride. Dental erosion is caused by food acids wearing down tooth enamel. Foods implicated in this include fruit juices, fruit drinks, cordials and fizzy drinks. The popular range of sour-sweet confectionery, those tasting sour at first followed by a sweet sensation, can now be added to the list. Lindy Sank from the Sydney Dental Hospital discusses dental erosion, its association with sweet-sour foods and how it can be prevented. She also updates us on the NSW Early Childhood Oral Health Program which incorporates 'Lift the Lip' for checking children's teeth.

Dr Anna Sanares, Paediatric Dentistry Specialist also from the Sydney Dental Hospital provides answers to commonly asked questions about Fluoride.

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When Sweet Turns Sour

During a recent dietary consult at the Paediatric Clinic of the Sydney Dental Hospital, a mother of a five year old girl remarked that her child's favourite treat every day after school was a large "sour goanna". Later that day, a young teenager admitted to purchasing a cola flavoured drink and "sour worm lollies" daily. Some time ago, a dentistry student reflected on how his oral mucosa had "burned" after consuming a quantity of popular hard sour lollies during a long train journey. The word "sour" has entered our sweet vocabulary.

Sour-sweet confectionery is increasing in popularity amongst consumers, both in Australia and overseas, with many familiar sweet products now offering a "sour" alternative such as gummy lollies, jelly beans, hard sucking sweets and lollypops, individual novelty items and sticky processed fruit rolls, a popular lunch box treat. The sour flavour is achieved by adding organic acids such as lactic, citric and malic acids. The high acid content of these foods makes them a potential risk factor for **dental erosion**, which can result in permanent and irreversible damage to dental enamel.

Other popular and frequently consumed foods by young children that may contribute to dental erosion, include fruit juices, fruit drinks, cordials and fizzy drinks. They also contain food acids and have a low (acidic) pH.

A recent in vitro study published in the British Dental Journal (1) compared the erosive effects of a variety of sour sweets with orange juice (pH 3.3-4.2), an acidic beverage. The sour sweets used in the study were highly acidic, with initial pH values of 2.3-3.14 compared to the neutral oral pH of 5.5. Many of the sweets studied required long sucking times which meant they had prolonged oral contact thus increasing the risk of damage to the teeth, lips and oral mucosa. The amount of enamel erosion produced by some of the sweets was between 2 and 3 microns over one hour, similar to that produced by other foods and drinks. However, others resulted in a loss of permanent enamel of between 7 and 10 microns/hour, the highest value reported in confectionery or foods according to the authors. Enamel losses from deciduous teeth were higher than those from permanent teeth. Two of the products tested produced a statistically significantly higher result than the orange juice control.

One of the limitations of the study was that it was conducted in vitro rather than in vivo. An in vivo study may have produced a different result, as salivary factors in the mouth stimulated by acidic foods, could have reduced the overall erosive potential.



Despite its shortcomings, the study showed that sour sweets are potentially erosive. Health professionals should advise parents of the potential dental risks in regularly consuming these foods, particularly for the more vulnerable deciduous teeth of young children. Sour confectionery and acidic drinks also contain simple sugars, making these foods a risk for *both* dental erosion and dental caries (decay). Of course, parents also need to be reminded that **all confectionery**, not just the sour varieties, put teeth at risk of decay because of its high sugar content.



NSW Early Childhood Oral Health (ECOH) Program

The NSW Early Childhood Oral Health (ECOH) Program is a community-based, early intervention program, designed to improve access to oral health care for children at high risk of Early Childhood Caries (ECC). The concept of anticipatory guidance - *to help families to understand what to expect during their child's current and approaching stage of development* - is integral to the success of this program.

The program links closely with the new Personal Health Record (Blue Book) in NSW. The health record now includes oral health information and a "lift the lip" assessment at the 6-8 month health check and every scheduled health check thereafter. The following resources have been developed to support Child Health Professionals with program implementation:

- i) Early Childhood Oral Health Guidelines for Child Health Professionals; and
- ii) Lift the Lip Brochure

These resources are available from the Better Health Centre on 29 9816-0452. *Lift The Lip* is also published in 15 other languages by the NSW Multicultural Health Communications Service http://www.mhcs.health.nsw.gov.au/mhcs/topics/Dental_Care.html

What is acid toothwear or dental erosion?

Dental erosion is a pathological, irreversible non carious loss of tooth enamel caused by acids. It can affect all age groups, with a recent estimate showing that 43% of adults and 80% of children in New Zealand have acid wear (2).

What is the cause of dental erosion?

Erosion is caused by acids of both intrinsic and extrinsic origins. The most common intrinsic source of erosive acid is hydrochloric acid produced by the stomach. It can affect people who experience GOR (gastro-oesophageal reflux) or frequent vomiting (sometimes occurring with eating disorders and pregnancy). Dietary acids both naturally occurring and added to processed foods and drinks are the most common cause of extrinsic acids.

What are food acids?

Food acids occur naturally in foods such as citric acid in citrus fruit, malic acid in green apples, tartaric acid in grapes and acetic acid in vinegar. Food acids are added to processed foods and drinks to give a sharp or sour taste.



How can I tell which food acids have been added to a product?

Food acids may be listed by name with the other ingredients on the product label or by the food additive number given to that particular acid.

Citric acid	330	Malic acid	296
Tartaric acid	334	Acetic acid	260
Fumaric acid	297	Ascorbic acid	300
Lactic acid	270	Phosphoric acid	338

What advice can we give parents and carers?

- Help parents become aware of the acidic nature of processed foods and drinks, especially those consumed between meal times.
- To reduce risk to teeth, sweet and/or acidic foods and drinks are best consumed at mealtimes.
- Educate about the risks of frequent use of such products to dental health.
- Teach parents how to read labels and identify acidic ingredients in processed foods and drinks.
- To lower risk, encourage regular healthy food choices, limit processed products, and make water the drink of choice.

References

1. Davies R, Hunter L, Loyn T, Rees J. Sour sweets: a new type of erosive challenge? *Br Dent J* 2008;204(2):49-52
2. Mahony EK, Kilpatrick NM. Dental erosion: part 1. Aetiology and prevalence of dental erosion. *N Z Dent J* 2003;99(2):33-41



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Fluoride Fundamentals

Mention *Fluoride* and there are some who cannot speak more highly of its abilities while others will voice their opposition. That leaves the majority of us rather more confused than clear about its properties and the most appropriate advice to give parents and carers.

What is fluoride?

Fluoride ions come from the naturally occurring element fluorine. Fluoride ions in combination with other elements form fluoride compounds that are found in minerals, soil and rock. Water passing across rock formations dissolves the fluoride compounds resulting in the release of some of the fluoride ions into the water.

How does fluoride prevent dental decay?

Fluoride protects the teeth from dental decay by making dental enamel more resistant to acid dissolution. Incorporation of fluoride into the crystalline lattice of dental enamel increases its resistance to an acidic environment.

The two ways fluoride may protect the teeth from decay are systemic and topical. Ingested fluoride during dental development is incorporated into the tooth structure making teeth more resistant to dental decay. More recent studies have shown that the greatest benefit of fluoride is its topical effect on erupted teeth.

What is water fluoridation?

Water fluoridation is the process of adjusting the level of fluoride in the water to a level that is optimum for dental health. The optimal fluoride concentration varies from 0.7 to 1.2 parts per million (ppm), depending on the maximum temperature in the region.

What are the advantages of water fluoridation?

Water fluoridation decreases the risk of dental caries by 20% to 40%. It is the most important public health measure for caries prevention as it provides the same level of caries protection regardless of socioeconomic level, education, availability of *dental manpower and other social factors*.

Are fluoride supplements effective?

Fluoride supplements may be recommended for children living in non-fluoridated areas. Prescriptions should be given by a qualified dental professional based on the child's age and the level of naturally occurring fluoride in the water. For fluoride supplements to have the equivalent effect of preventing caries as water fluoridation, they must be taken daily from age 6 months to 16 years. As a public health measure, they tend to have minimal benefit because of limited long term patient compliance. However, they may benefit children at high risk of caries.

The table on the next column shows the NHMRC guideline (3) for daily fluoride lozenges supplement for patients at high risk of dental caries.

Age	Water fluoride concentration	
	<0.3mg/l	0.3-0.5 mg/l
6 months to 4 years	0.25 mg	0
4 to 8 years	0.5 mg	0.25 mg
8 years and above	1.0 mg	0.50 mg

Are prenatal supplements effective?

There has been minimal literature studying the effect of prenatal fluoride supplements and caries prevention in children. The literature does not show any benefits from prenatal fluoride supplements with regards to caries reduction.

The low fluoride levels in breast milk (0.007 – 0.011 ppm) do not significantly contribute to the infant's fluoride exposure. This is also true for fluoride ingested by the mother either through fluoridated drinking water or fluoride supplements.

When should children start using fluoride toothpaste?

The Australian Dental Association and American Dental Association recommend a pea-sized amount of toothpaste for children 6 years old and younger to avoid excessive ingestion of fluoride (1,2). **Parents/guardians who are considering the use of fluoride toothpaste on a child less than 2 years old should seek advice from a dental professional (2).** Conventional toothpastes contain 1000ppm of fluoride. Low fluoride toothpastes containing 400ppm and 500ppm are recommended for use in children from age 2 years to 6 years. Children up to 8 years old have limited dexterity to brush their teeth effectively and should be assisted by a parent/guardian. Caries reduction from the use of fluoride toothpaste is estimated to be around 25% (3).

What is dental fluorosis?

Dental fluorosis is a defect in the enamel caused by ingesting fluoride above the recommended optimal level during enamel formation. Permanent teeth crowns, with the exception of the third molars, develop from birth until 5 years of age and are most susceptible to developing fluorosis. Fluorosis manifests as the loss of translucency of the incisal edges of the teeth in mild cases, to mottling, staining and loss of enamel in severe cases. Most dental fluorosis is considered mild and of minimal aesthetic concern.

It is difficult to determine the exact cause of dental fluorosis as an individual may be exposed to several sources of fluoride (ie fluoridated water, toothpastes, food, beverages, dietary fluoride supplements). Some studies have shown that ingestion of fluoride toothpaste is more likely to cause fluorosis than fluoride from drinking water.

Conclusions

- Water fluoridation is the most effective public health measure for caries prevention
- Fluoride supplements may be recommended and prescribed by dental professionals for children living in non-fluoridated communities
- Prenatal fluoride supplements do not provide additional benefits for caries reduction in infants and toddlers
- Tooth brushing with low fluoride toothpaste is recommended for children 2 to 6 years old

References:

1. NH&MRC, 2007: A Systematic Review of the Efficacy and Safety of Fluoridation. www.ada.org.au/oralhealth/fn/fresources.aspx
2. American Dental Association 2005: Fluoridation Facts www.ada.org.au/oralhealth/fn/fresources.aspx
3. Cameron and Widmer. Handbook of Paediatric Dentistry. 2nd edition. 2003. Chapter 2. Fluoride modalities pp. 28 – 43

Small Talk



1. ESPGHAN Position Paper on Complementary Feeding

The European Society for Paediatric Gastroenterology, Hepatology and Nutrition (ESPGHAN) Committee on Nutrition has prepared a position paper on the complementary feeding of healthy, full term infants living in industrialised countries like Europe, during the first year of life (1).

Complementary foods are defined as all solid and liquid foods other than breast milk, infant formula and follow on formula. This differs from the World Health Organisation's (WHO) definition where complementary foods include all foods other than breast milk (in order to promote breast feeding). ESPGHAN did not include infant formula and follow on formula in their definition of complementary foods believing it was confusing, as many infants in industrialized countries are fed infant formula from birth.

Some of the conclusions are:-

- Aim to exclusively breast feed for about 6 months
- Complementary foods should not be given before 17 weeks and no later than 26 weeks, the exact timing depending on the infant's nutritional and developmental needs. This contrasts with the WHO recommendation of not introducing complementary foods till 6 months of age. It should be noted that the WHO recommendation applies only to population groups of infants exclusively breast fed. It does, however, acknowledge that not all mothers will be able to nor want to breast feed exclusively for 6 months.

The ESPGHAN committee decided to adopt the 17 week to 26 week time frame of introducing solids because it felt the scientific evidence on which the WHO recommendation was based was limited and at odds with current practise in many industrialized countries.

- By around 4 months of age, the infant's gastrointestinal and renal systems are mature enough to handle complementary foods. Lumpy foods should be introduced by 10 months to avoid difficulties in introducing them later.
- Cows milk should not be the main milk drink till after 12 months as it is low in iron. Small amounts can be used on other foods
- The scientific evidence is unconvincing that delaying the introduction of potentially allergic foods will reduce allergies in those at risk or those not at risk. Introduce foods one at a time to allow detection of reactions to individual foods.
- Avoid introducing gluten before 17 weeks and after 26 weeks. Give small amounts gradually between 17 weeks and 26 weeks while breast feeding as this may reduce coeliac disease, type 1 diabetes and wheat allergy
- Vegan diets are unsuitable for infants
- Vegetarian infants need at least 500ml of breast milk or infant formula and dairy products daily

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References

1. Agostini C, Decsi T, Fewtrell M et al. Complementary Feeding: A Commentary by the ESPGHAN Committee on Nutrition. *J Pediatr Gastroenterol Nutr* 2008;46(1):99-110

Heinz Update



New Finger Foods Poster

Older infants and toddlers love to feed themselves and we know that Mums are always looking for information about foods that are appropriate and healthy. Our colourful new finger foods poster (see pictured) pictures a range of simple, healthy

foods suitable as finger foods. If you would like a copy for your clinic/rooms, please email us at hifas@au.hjheinz.com and we'll send you a free copy.



New Heinz Organic Fruit Varieties

Heinz Organic continues to grow in popularity, with 2 new fruit flavours in the All Ages range: Banana & Blueberry Custard and Stewed Pear & Currant.

All Heinz infant foods meet the Pure Start® program requirements with:

- no added salt
- no preservatives
- no added colours or artificial flavours

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NEW

www.heinznurture.com.au

– visit this site for information on Heinz Nurture infant formulas and toddler milks

www.heinzforbaby.com.au – visit the health professional section on the website.

The Heinz Product Info Line 1800 633 333 provides information to callers on Heinz Baby Food products.

All callers are asked to contact the child health service in their state or territory for individual advice.

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