

# TEETH

## Oral Health Information for Maternal & Child Health Nurses

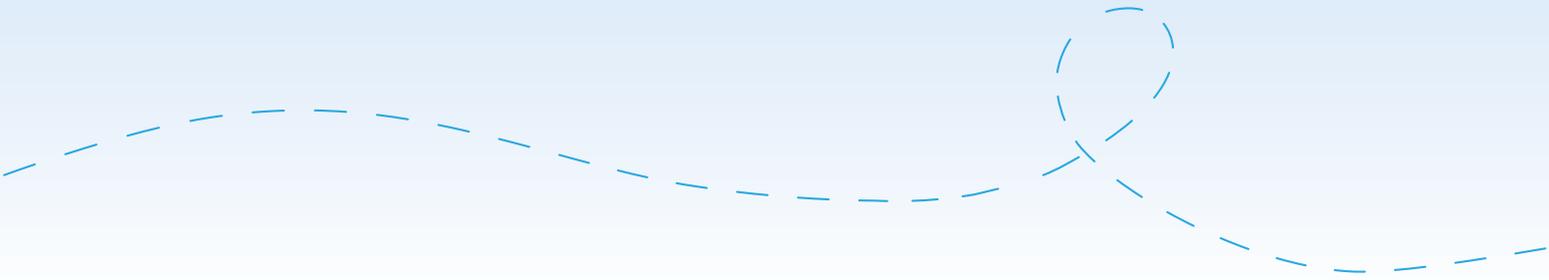




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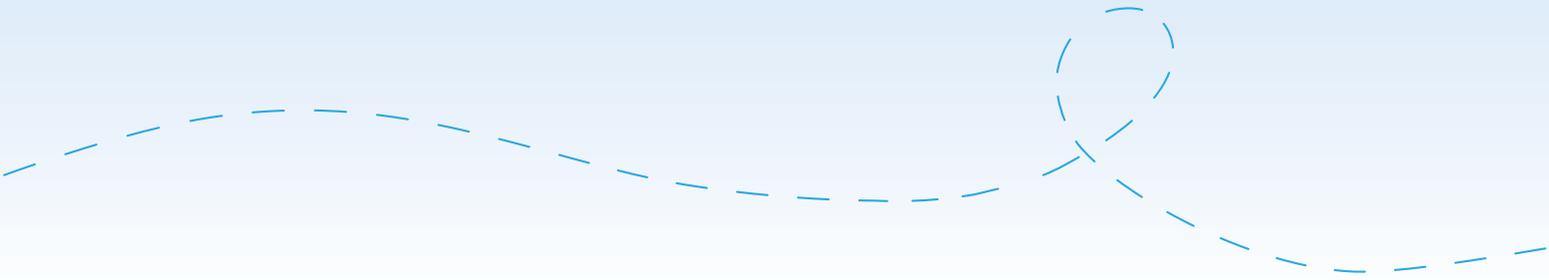
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This document describes the generally accepted practice at the time of publication. It is a guide only and as such is a general summary of the clinical knowledge. Maternal and child health nurses should regularly update their knowledge of the area and exercise their clinical judgment when applying this information.

If you have any doubts as to the correct application of this information, you should obtain advice from an oral health professional.

No warranty is made, expressed or implied, that the information contained in this document is comprehensive. Parties associated with this publication accept no responsibility for any consequence arising from inappropriate application of this information.

*TEETH: Oral Health Information for Maternal and Child Health Nurses* is also available online from the Dental Health Services Victoria website ([www.dhsv.org.au](http://www.dhsv.org.au)) under *Oral health resources > Guides and resources*.



## ii. Foreword

Dental Health Services Victoria in partnership with the Department of Education and Early Childhood Development is pleased to present an updated version of the 2004 publication *TEETH: Oral Health Information for Maternal and Child Health Nurses*. This resource has been redeveloped by the health promotion team of Dental Health Services Victoria to assist maternal and child health nurses in their health promotion, prevention, early detection and intervention role.

Oral health is essential for overall health and wellbeing, and maternal and child health nurses are well placed to promote the oral health of young children. The maternal and child health service is a universal primary care service, engaging Victorian families with children from birth to school age with the aim of promoting healthy outcomes for both children and their families.

*TEETH* has been designed as a supportive tool for maternal and child health nurses, specifically for when they are implementing the oral health components of the maternal and child health service's key ages and stages framework.

Dental Health Services Victoria has identified all children aged 12 years and under as a priority group for access to dental services. Maternal and child health nurses play an important role in assisting families to access these services.

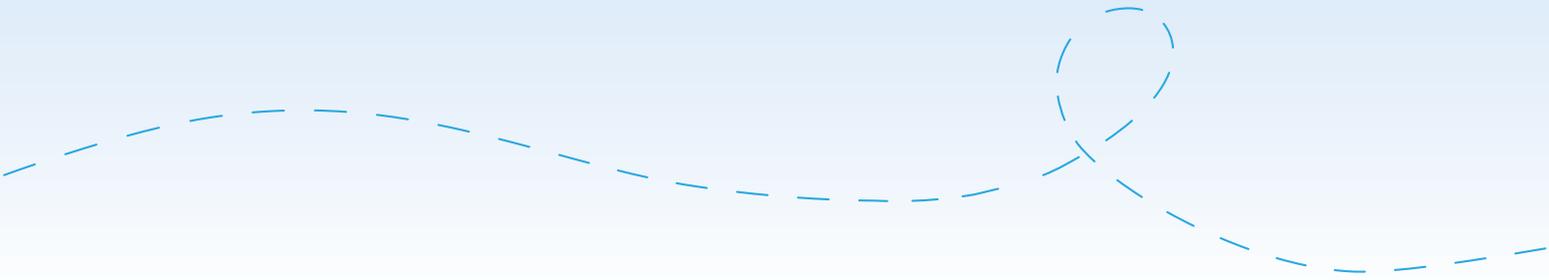
We would like to thank the stakeholders who contributed their expertise in, and enthusiasm for, oral health and oral health promotion practice to develop this resource.



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# 1. Introduction

## This section covers:

- 1.1 The importance of oral health
- 1.2 Oral health policy context
- 1.3 Maternal and child health service policy context
- 1.4 Using this resource

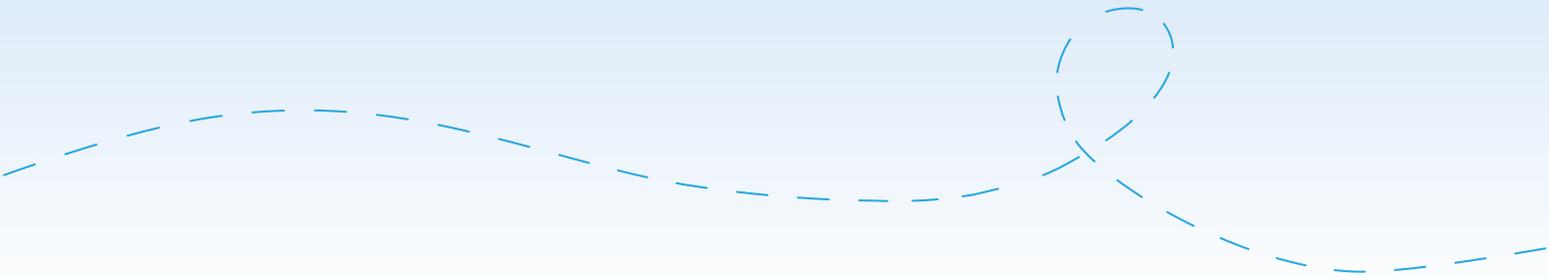
## 1.1 The importance of oral health

There are many reasons to promote oral health in young children. Good oral health is an essential part of general health and well-being, yet the importance of oral health is not widely recognised. Good oral health in childhood also contributes to good oral health in adulthood (Department of Education and Early Childhood Development 2009). The deciduous teeth (sometimes referred to as first, primary or milk teeth) are important for young children as they help develop eating ability, speech patterns and appearance, and also guide the eruption and position of the permanent teeth.

Oral disease is largely preventable, but many children still suffer unnecessarily from the pain and complications of dental caries (decay).

- Data for children attending public dental clinics (2009–10) shows that 33 per cent of zero-to-five-year-old children experienced dental caries, 69 per cent of which was untreated (Dental Health Services Victoria 2010).
- The Child Dental Health Survey Australia 2003–04 (2009) shows that nearly half (48.9%) of six-year-old children had a history of dental caries in their deciduous teeth.
- The 10 per cent of four-to-six-year-old children with the most extensive history of deciduous dental caries had more than nine deciduous teeth affected, approximately four and a half times the national average, demonstrating that a minority of children carry a greater than average burden of disease (Armfield, Spencer & Brennan 2009).

Every child is at risk of developing dental caries, although some groups of children are more vulnerable than others. Children from lower socio economic backgrounds, culturally and linguistically diverse communities and rural communities experience the greatest risk. Furthermore, in Australia, children living in areas with optimal water fluoridation experience considerably less dental caries than those in areas without fluoridation (Department of Health 2010).



## 1.2 Oral health policy context

### ***Healthy mouths, healthy lives: Australia's National Oral Health Plan 2004–2013***

In 2004, Australia's health ministers endorsed the 'National Oral Health Plan 2004–2013' with the aim to improve health and well-being across the Australian population by improving oral health status and reducing the burden of oral disease. Four broad themes underpin the plan:

- Recognition that oral health is an integral part of general health.
- A population health approach, with a strong focus on promoting health, early intervention and the prevention of oral disease.
- Access to appropriate and affordable services – health promotion, prevention, early intervention and treatment for all Australians.
- Education to develop sufficiently and appropriately skilled workers and communities to effectively support and promote oral health.

From these themes seven action areas were identified. Action area two focuses specifically on children and adolescents. The outcome for this action area is:

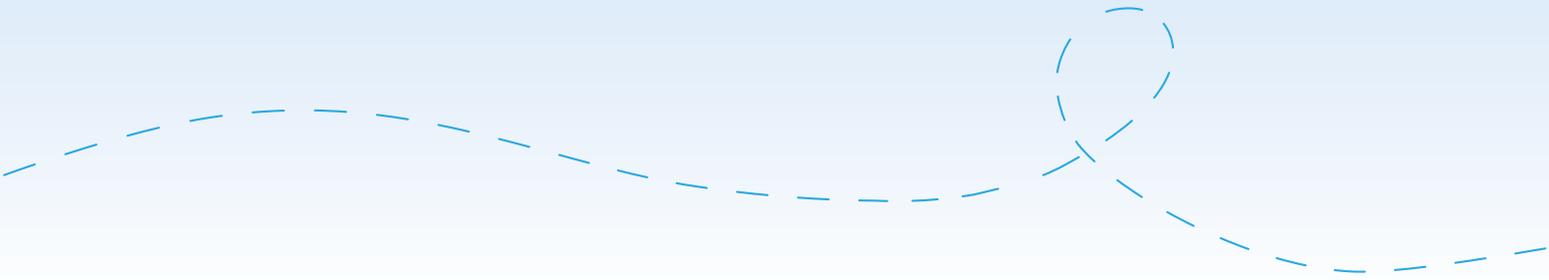
Good oral health for all infants, children and young people, to support overall health and quality of life and underpins good oral health throughout life, to be achieved through:

- collaborative oral health education and promotion
- preventative focused oral health care
- introducing oral health into primary health and community care systems.

Specifically, action 2.1 looks at the context of maternal and child health:

Include a simple oral health risk assessment and provide preventative oral health advice in:

- routine checks carried out by maternal and child health
- existing home visiting programs for infants and families identified as being at risk.



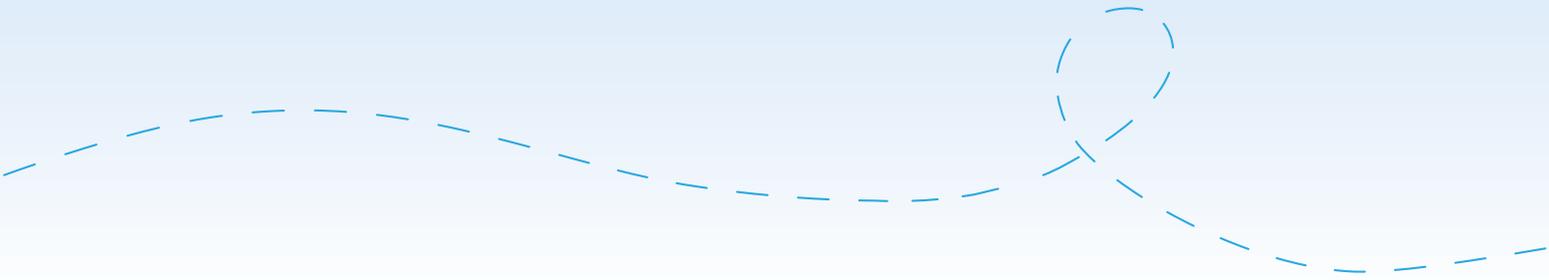
### ***Improving Victoria's Oral Health***

'Improving Victoria's Oral Health' is the Victorian government's four-year strategic plan for public dental health services and oral health, with the goal being that, 'All Victorians will enjoy good oral health and will have access to high-quality health care delivered in an affordable and timely fashion when they require it' (Department of Human Services 2007).

Since 2003 there has been a focus on the oral health of children under preschool age, including the following community dental service initiatives:

- All children younger than 12 are eligible to access the public dental system through community dental services.
- Children receive general oral health advice as well as dental check-ups and treatment.
- Children will receive priority access, meaning they do not have to go on a waiting list and will be given the next available appointment.
- This service is free for those who hold a valid health care card or a pensioner concession card.
- A fee of \$29\* for a course of general care per child applies to non-card-holders (the most a family will pay is \$116\*).

\* Fees are subject to change



### 1.3 Maternal and child health service policy context

The maternal and child health service is a universal primary care service for Victorian families and children from birth to school age. The service is provided in partnership with the Municipal Association of Victoria, local government and the Department of Education and Early Childhood Development and aims to promote healthy outcomes for children and their families. The service provides a comprehensive and focused approach for the promotion, prevention, early detection and intervention of the physical, emotional or social factors affecting young children and their families in contemporary communities.

The revised maternal and child health key ages and stages service activity framework was rolled out state wide in 2009. This Framework introduces a new approach to the ten key ages and stages consultations provided to parents and children by the universal maternal and child health service.

- The framework comprises three key components; monitoring, promotion of health and development and intervention.
- It identifies the core activities for the ten universal consultations that the Maternal and Child Health service should offer to all Victorian children and their families.
- This framework is intended to be complemented by opportunistic activity by maternal and child health nurses, on the basis of their clinical judgement, in response to other parental concerns and nurse observation.
- Evidence based written health information; consistent with the health promotion activities listed in the framework and distributed at each key age and stage consultations.

Oral health has been identified by the Office for Children and Early Childhood Development as one of the key aspects of child health and wellbeing, learning and development and safety that are vital to the future of Victorian children (DEECD 2009).

The Maternal and Child Health Practice Guidelines (2009) were written to support the revised maternal and child health key ages and stages framework. The maternal and child health nurse performs a full oral assessment using the 'Lift the Lip' principles at the 8 month, 18 month and 3.5 year consultations. All other maternal and child health key age and stage consultations allow for opportunistic use of anticipatory guidance in the promotion of oral health.

To support maternal and child health nurses in oral health education, tooth tips for parents, grandparents and carers, which cover key oral health information from 0-12 months, 12-18 months and 18 months to six years, are provided as a part of the following key ages and stages consultations:

- eight-month consultation – tooth tips 0-12 months
- twelve-month consultation – tooth tips 12-18 months
- eighteen-month consultation – tooth tips 18 months - 6 years.

# Maternal and Child Health Service

## Key Ages and Stages Framework

| KAS visit  | Health & Development Monitoring   | Intervention*   | Promotion of Health & Development   |
|------------|---|---|---|
| Home visit | Family Health & Wellbeing<br>Pregnancy, birth, family history<br>Smoking  | QUIT intervention & referral<br>Respond to assessments                          | Breastfeeding<br>Immunisation<br>SIDS: view infant sleep arrangements<br>Safe Sleeping Checklist                            |
| 2 weeks    | Family Health & Wellbeing<br>Full physical assessment<br>- includes Developmental Review<br>Hearing risk factors  | Respond to assessments  | Car restraints<br>Communication, language and play<br>Injury prevention - Kidsafe   |
| 4 weeks    | Family Health & Wellbeing<br>Maternal Health & Wellbeing check<br>Hips<br>Weight, length, head circumference  | Family Violence- safety plan<br>Respond to assessments<br>Post Natal Depression | Breastfeeding<br>Immunisation<br>Women's Health   |
| 8 weeks    | Family Health & Wellbeing<br>Full physical assessment<br>- includes Developmental Review  | Respond to assessments  | Immunisation<br>SIDS risk factors   |
| 4 months   | Family Health & Wellbeing<br>Developmental Assessment (PEDS/Brigance)<br>Hips<br>Weight   | Respond to assessments  | Communication, language and play<br>Food in first year of life<br>Playgroup<br>Young Readers                                |
| 8 months   | Family Health & Wellbeing<br>Full physical assessment<br>Oral health<br>Developmental Assessment (PEDS/Brigance)<br>Hearing risk factors<br>Infant sleeping | Sleep Intervention<br>Respond to assessments                                    | Communication, language and play<br>Injury prevention - Kidsafe<br>Poison information<br>Sunsmart<br>Tooth Tips             |
| 12 months  | Family Health & Wellbeing<br>Developmental Assessment (PEDS/Brigance)<br>Hips<br>Weight & length  | Respond to assessments  | Communication, language and play<br>Healthy eating for young toddlers<br>Immunisation                                       |
| 18 months  | Family Health & Wellbeing<br>Developmental Assessment (PEDS/Brigance)<br>Oral health<br>Weight, height, gait  | Teeth cleaning<br>Respond to assessments  | Communication, language and play<br>Injury prevention - Kidsafe<br>Tooth tips   |
| 2 years    | Family Health & Wellbeing<br>Developmental Assessment (PEDS/Brigance)<br>Weight & height, gait  | Promote a Healthy Weight<br>Respond to assessments                              | Communication, language and play<br>Kindergarten enrolment<br>Young Readers   |
| 3.5 years  | Family Health & Wellbeing<br>Developmental Assessment (PEDS/Brigance)<br>Vision (MIST)<br>Oral health<br>Weight & height, gait                              | Promote a Healthy BMI<br>Respond to assessments                                 | Communication, language and play<br>Healthy eating and play for kindergarten<br>Immunisation<br>Injury prevention - Kidsafe |

\* At all visits nurses will respond to parental concerns (e.g. parenting, safety or health issues) and act on professional observation and judgement (including notifications under the Child, Youth and Families Act 2005)



# Maternal and Child Health Service

## Child Outcomes

The Office for Children and Early Childhood Development has reviewed the evidence about the factors that make a real difference to children and young people and has identified 35 aspects of child health and wellbeing, learning and development and safety that are essential to our children's future. These aspects are known as the Outcomes for Children<sup>1</sup>. The following table identifies the outcomes, and the measurable indicators associated with each of the topics covered by the revised Maternal and Child Health Key Ages and Stages activity framework. It is important to note that the Maternal and Child Health service may play a key role, or a supportive role, in improving the identified outcomes for children and their families

| Topic  | Outcome   | Indicator   |
|--|---|---|
| SIDS   | Optimal antenatal and infant development                    | Sudden Infant Death Syndrome (SIDS) rate for infants  |
| Safe sleeping                                | Parent promotion of child health and development            | Proportion of infants put on their back to sleep from birth   |
| Smoking                                      | Optimal antenatal and infant development                    | Proportion of children exposed to tobacco while in utero  |
|  | Healthy adult lifestyle                                     | Proportion of women who used illicit drugs during pregnancy<br>Proportion of children and young people exposed to tobacco smoke in the home   |
| Immunisation                                 | Free from preventable disease                               | Proportion of children who are fully vaccinated   |
| Breastfeeding/Solids                         | Adequate nutrition  | Proportion of infants breastfed<br>Proportion of children and young people who eat the minimum recommended serves of fruit and vegetable every day  |
| Post Natal Depression/<br>Sleep Intervention | Good parental mental health                                 | Proportion of mothers with post-natal depression<br>The proportion of children and young people who have parents with mental health difficulties  |
| Injury prevention                            | Safe from injury and harm                                   | Age specific death rates from injuries and poisoning<br>Age specific hospitalisation rates from injuries and poisoning  |
| Family violence                              | Free from child exposure to conflict or family violence     | Proportion of mothers exposed to partner violence<br>Proportion of family violence incidents witnessed by children and young people   |
| Growth                                       | Healthy weight  | Proportion of children and young people who are overweight and obese  |
| Oral Health                                  | Healthy teeth and gums                                      | Proportion of children and young people who brush their teeth twice a day   |
| Literacy                                     | Parent promotion of child health and development            | Proportion of children who are read to by a family member every day   |
| Vision                                       | Early identification of and attention to child health needs | Proportion of parents concerned about their child's vision  |
| Physical Assessment                          | Early identification of and attention to child health needs | Proportion of infants receiving a Maternal and Child Health Services home consultation<br>Proportion of infants aged 0-1 month enrolled at Maternal and Child Health Services from birth notifications<br>Hospital admissions for gastroenteritis in children under one year of age |

March 2009

<sup>1</sup> Department of Human Services, The State of Victoria's Children Report 2006 (October 2006)



Department of Education and  
Early Childhood Development



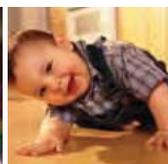
# Maternal and Child Health Service: Promotion of Health and Development

Evidence based written health information, listed in the following table, will be distributed at each key age and stage consultation. This information is designed to support a facilitated discussion with parents about key health promotion messages. It will also ensure that consistent quality written information is provided to parents across the state.

## Key Ages & Stages Visit

| Key Ages & Stages Visit | Health Promotion  | Pamphlets  |
|-------------------------|---|--|
| Home visit              | SIDS safe sleeping: view infant sleep arrangements, checklist | Sids and kids safe sleeping<br>Safe Sleeping Checklist   |
|                         | Safety  | Its not OK to shake babies   |
|                         | Learning  | Making the most of childhood: the importance of the early years<br>Kids talk 75 ways to talk to children                         |
|                         | Breastfeeding   | Go for your life: Successfully starting and maintaining breastfeeding  |
| 2 weeks                 | Communication, language and play                              | Communication, language and play bookmark  |
|                         | Road safety   | Choosing and using restraints. A guide for parents with children from birth to 16 years  |
|                         | Injury prevention   | Safe kids now - Babies from birth to crawling. Birth – 9months   |
| 4 weeks                 | Education for parents   | Raising Children Network the Australian Parenting Website  |
|                         | Women's Health  | One in three women who ever had a baby wet themselves  |
|                         | Post Natal Depression   | Emotional health during pregnancy and early parenthood   |
| 8 weeks                 | Immunisation  | No pamphlets for this visit  |
|                         | SIDS risk factors   |  |
| 4 months                | Food in first year of life                                    | Food in the first year of life<br>Why no sweet drinks for children   |
|                         | Communication, language and play                              | Communication, language & play bookmark and information sheet<br>Young Readers - Rhyme time: book & DVD                          |
|                         | Playgroup   | Baby Play and Baby Playgroups  |
| 8 months                | Poison information  | Is your home poison proof?   |
|                         | Communication, language and play                              | Communication, language and play bookmark and information sheet  |
|                         | Sunsmart  | Sunsmart The outside 5   |
|                         | Tooth Tips  | Tooth tips 0 – 12months  |
|                         | Injury prevention   | Safe kids now - Toddlers on the move 9 – 18 months   |
| 12 months               | Healthy eating for young toddlers                             | Healthy eating and play for toddlers (1 - 2 years)   |
|                         | Communication, language and play                              | Communication, language and play bookmark and information sheet  |
|                         | Dental  | Tooth tips thumb and finger sucking 1 - 2 years  |
| 18 months               | Communication, language and play                              | Communication, language and play bookmark and information sheet  |
|                         | Injury prevention   | Safe kids now - Inquisitive and invincible 1.5 - 3.5 years   |
|                         | Dental  | Tooth tips dental visits 18 months - 6 years   |
|                         | Playgroup   | You can start a playgroup!   |
| 2 years                 | Kindergarten enrolment  | Why should my child go to a kindergarten program?<br>Enrol in a kindergarten program.  |
|                         | Communication, language and play                              | Communication, language and play bookmark and information sheet<br>Young Readers - book  |
|                         | Healthy eating and play for kindergarten                      | Healthy eating and play for kindergarten children (3 - 5 years)  |
| 3.5 years               | Injury prevention   | Try it - you'll like it, vegetable and fruit for children<br>Safe kids now - Pre-schoolers: independent adventures 3.5 - 5 years |
|                         | Starting kindergarten   | Is your child 3 - 4 years?   |
|                         | Communication, language and play                              | Communication, language and play bookmark and information sheet  |
|                         | Immunisation  | Starting primary school - your child must have a school entry immunisation   |

March 2009



Every child, every opportunity

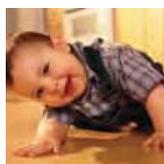


# Maternal and Child Health Service: Promotion of Health and Development

## Pamphlet

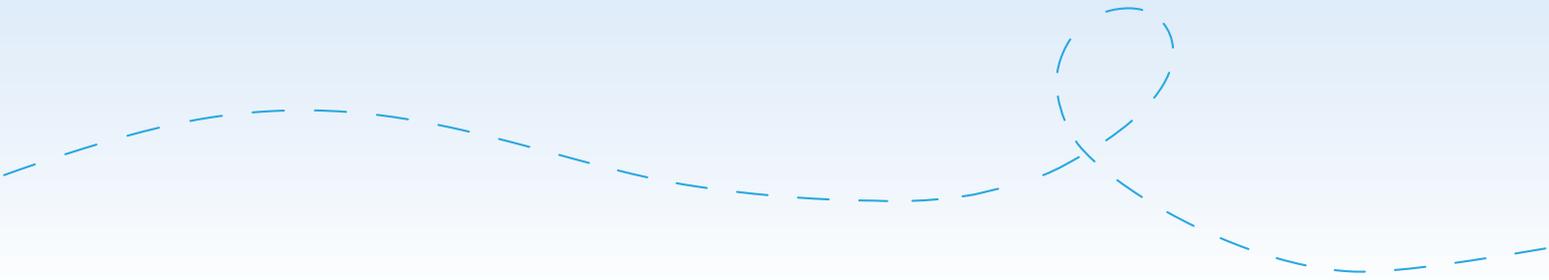
## Health information: source

|  |  |
|--|--|
| It's not OK to shake babies  | NAPCAN   |
| SIDS and kids safe sleeping<br>Safe sleeping checklist   | SIDS and Kids  |
| Making the most of childhood: the importance of the early years<br>Is your home poison proof?  | Department of Education and Early Childhood Development<br>Victorian Government                      |
| National Immunisation Program Schedule   | Australian Government Department of Health and Ageing  |
| Starting primary school - Your child must have a school<br>entry immunisation certificate  | Department of Human Services   |
| Kids talk 75 ways to encourage children<br>Growth chart  | Parent Kit from Department of Education and<br>Early Childhood Development                           |
| Communication, language and play bookmarks and information sheets  | Department of Education and Early Childhood Development  |
| Choosing and using restraints: A guide for parents<br>with children from birth to 16 years   | Vic Roads  |
| Safe kids now - From birth to crawling: Birth – 9 months<br>Safe kids now - Toddlers on the Move 9 - 18 months<br>Safe kids now - Inquisitive and Invincible 1.5 - 3.5 years<br>Safe kids now - Preschoolers: Independent adventures 3.5 to 5 years  | Kidsafe  |
| Raising Children Network the Australian Parenting Website  | Smart Population Foundation, Centre for Community Child Health<br>and the Victorian Parenting Centre |
| One in three women who ever had a baby wet themselves  | Victorian Continence Resource Centre   |
| Emotional health during pregnancy and early parenthood   | Beyond Blue  |
| Successfully starting and maintaining breastfeeding<br>Food in the first year of life<br>Why no sweet drinks for children<br>Healthy eating and play for toddlers 1 - 2 years<br>Healthy eating and play for kindergarten children 3 - 5 years<br>Try it - you'll like it, vegetables and fruit for children | Go for your life   |
| Baby Play and Baby Playgroups<br>Discover playgroup  | Victorian Playgrouping Association   |
| Sunsmart The Outside Five  | Cancer Council Victoria  |
| Tooth tips 0-12 months<br>Tooth tips dental visits 18 months to 6 years<br>Tooth tips thumb and finger sucking 1 - 2 years   | Dental Health Services Victoria  |
| Starting Kindergarten - Why should my child go to a kindergarten program?<br>Enrol in a kindergarten program   | Department of Education and Early Childhood Development  |
| Is your child 3 - 4 years?   | Department of Education and Early Childhood Development  |



Every  
child.  
every  
opportunity





## 1.4 Using this resource

The purpose of TEETH is to provide maternal and child health nurses with oral health information to assist them in the oral health component of their primary health care role.

The information provided has been developed in recognition of the knowledge and skill base of maternal and child health nurses, and it is intended as a support material that complements this knowledge.

**Section Two – Tooth Development:** provides comprehensive information about the development of teeth, starting in utero and following through to the eruption of the permanent teeth. Teething, tooth grinding and thumb and finger sucking are also covered.

**Section Three – Mouth Checks:** is designed to link with the oral health components of the key ages and stages framework. This section describes how to look in a child's mouth, what to look for when completing a mouth check and suggests discussion points to bring up with parents and carers.

**Section Four – Promoting Individual Oral Health Practices:** describes practices that are supportive of good oral health that maternal and child health nurses can promote to parents. This includes tooth brushing, diet and nutrition, visiting a dental professional and the importance of a mother's oral health.

**Section Five – Promoting Population Oral health: Fluoride:** provides information about fluoride. It may also help inform conversations with parents.

**Section Six – Dental Disease and Trauma:** provides information on types of dental diseases that may affect children, including dental caries, early childhood caries, gingivitis and periodontal disease. This section also describes what to do if a tooth is knocked out.

**Section Seven – Oral Medicine:** provides information and photographic images to describe oral conditions that can affect young children. These may assist maternal and child health nurses to identify conditions and help them decide when to refer children to an oral health or medical professional.

**Section Eight – Dental Services and Contacts:** provides an overview of Victoria's public dental system, including access for children and contact information. This section also includes other useful contacts and websites.





## 2. Tooth Development

### **This section covers:**

- 2.1 Life cycle of a tooth
- 2.2 Stages of tooth development
- 2.3 Tooth structure
- 2.4 Types of teeth including deciduous and permanent
- 2.5 The eruption sequence of the deciduous and permanent teeth
- 2.6 Teething
- 2.7 Tooth grinding
- 2.8 Thumb and finger sucking, lip sucking and discussion with parents and carers

### **2.1 Life cycle of a tooth**

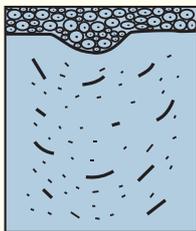
#### ***Deciduous teeth***

The formation of deciduous (baby) teeth is a process that begins after eight weeks in utero. The lower anterior (front) teeth are formed first, followed by the upper anterior teeth. This process continues after birth until the full set of ten upper (maxillary) teeth and ten lower (mandibular) teeth have erupted. Eruption of the deciduous teeth usually begins when an infant is six months old. Children will usually have their full set of deciduous teeth by three years of age.

#### ***Permanent teeth***

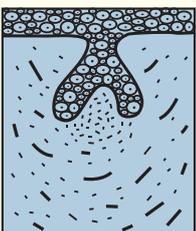
Permanent teeth (or secondary teeth) begin forming during the 24th week in utero. The lower anterior teeth are formed first followed by the upper anterior teeth. The development continues after birth until 16 upper (maxillary) teeth and 16 lower (mandibular) teeth have erupted. The permanent teeth begin to erupt when a child is around six years of age. Eruption continues until the upper and lower second molars erupt between 11-13 years and the upper and lower third molars (wisdom teeth) if they are present may erupt up to the age of 24 years. Not everyone will develop these third molars or wisdom teeth.

## 2.2 Stages of tooth development



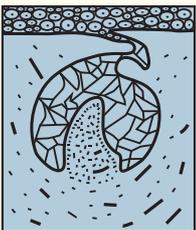
### 1. Bud stage (eight weeks in utero)

The bud stage is the beginning of the development of each tooth. This starts with the formation of the dental lamina (a sheet of epithelial cells following the curves of the gums), which produces ten enlargements in each arch – these are the tooth buds. The tooth buds for the permanent teeth (which develop in a deeper part of the dental lamina) begin to form after 24 weeks in utero.



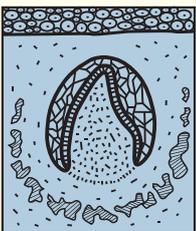
### 2. Cap stage (nine to ten weeks in utero)

During the cap stage the cells of the tooth grow and increase in number. The growth causes the tooth to bud into a cap-like shape. During this stage, three primary structures begin to form, including the enamel organ (which forms the tooth's enamel), dental papilla (forming the dentine and pulp) and the dental follicle (forming the cementum). These three structures work together in the development of a tooth.



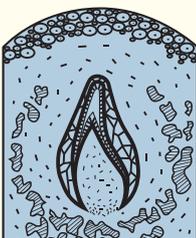
### 3. Bell stage (11 to 12 weeks in utero)

During the bell stage the cells differentiate and specialize, forming the various layers of the tooth. Enamel-forming cells, dentine-forming cells and cementum-forming cells are created.



### 4. Assuming the shape of a tooth

While the structures of the teeth are still developing, the surrounding area of the jaw also develops. Bone cells form the upper jaw (maxilla) and the lower jaw (mandible), and the shape of the future tooth crown is defined. The tooth crown is the part of the tooth that sits above the gum line — the part that you can see.



### 5. Tooth completely shaped

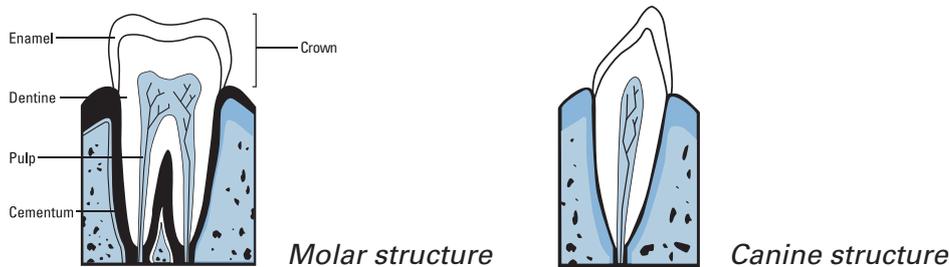
During the final stages of tooth formation, the enamel and dentine cells increase in layers until the tooth is completely shaped. When the eruption of a tooth occurs, only a small portion of the root has formed. The tooth will be fully erupted for approximately two years before the full root length and thickness is attained.



### 6. Tooth calcification

In the final stage of tooth development, the different layers making up the teeth calcify. Calcification is the hardening of the structure of the tooth by the deposit of calcium and other mineral salts. If a fully-formed tooth is damaged, it cannot repair itself like bone or skin. Damage at this point can have a great impact on the quality of the teeth.

## 2.3 Tooth structure



### **Crown**

The crown is the part of the tooth that sits above the gum line (the visible portion of the tooth).

### **Enamel**

The crown is covered with enamel. Enamel is the hardest calcified tissue in the human body and is the protective layer of the tooth. It also provides a strong surface for crushing, grinding and chewing food. Enamel is thicker at the biting surface of the tooth and thinner near the gum line. Enamel is translucent and can range in colour from yellow to greyish white. The enamel portion of the tooth has no nerve supply. Even though the enamel is very hard, it can wear away due to:

- ❗ attrition (wear of the tooth as a result of tooth-to-tooth contact)
- ❗ abrasion (wear of the tooth produced by something other than tooth-to-tooth contact, e.g. brushing with a hard brush)
- ❗ erosion (wear of the tooth brought about by chemical process, e.g. dissolved by acid)
- ❗ fracture due to stress or trauma
- ❗ effects of dental caries (acid attack produced by a bacterial process).

### **Dentine**

The layer under the enamel is the dentine. Dentine makes up the main portion of the tooth structure. In deciduous teeth, dentine is a very light yellow, while in permanent teeth it is light yellow but also somewhat transparent. Dentine, while highly calcified, is softer than enamel and carries sensations such as temperature and pain to the pulp.

### **Pulp**

The pulp is the innermost portion of the tooth and is the only soft tissue of the tooth. It is made up of blood vessels, cellular substance and nerves. It supplies nutrients to the tooth and its nerve endings transmit sensations such as pain and temperature to the nerves.

### **Cementum**

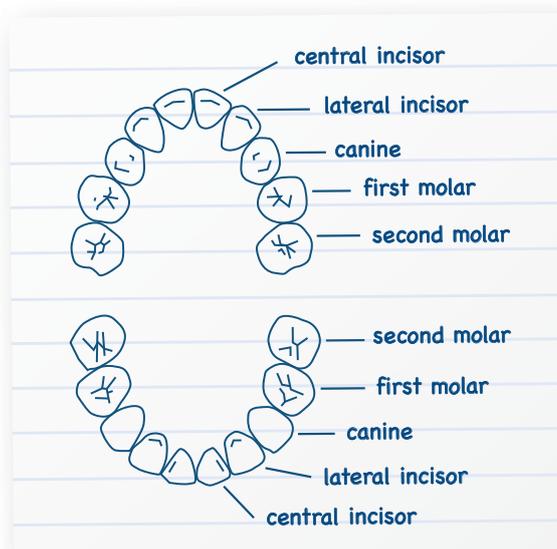
Cementum is a bone-like connective tissue that covers the root of the tooth. It is light yellow in colour and also carries sensations such as temperature and pain to the pulp. If the gum recedes from the tooth and the cementum is exposed, there may be a sharp sensation when brushing the teeth or eating food. This is usually an adult condition.

## 2.4 Tooth types

### **Deciduous teeth**

Deciduous teeth are also known as baby teeth, milk teeth, primary teeth or first teeth. Deciduous teeth are whiter, smaller and softer than permanent teeth. Because they are softer they might become quite worn due to the wear and tear of eating and grinding – this is quite normal. Around the age of six years, the deciduous teeth begin to become loose and fall out, and are replaced by permanent teeth. This process is known as exfoliation.

The incisors are used for cutting, the canines for tearing and the molars for chewing.



The upper arch (maxilla) and the lower arch (mandible) both have ten deciduous teeth:

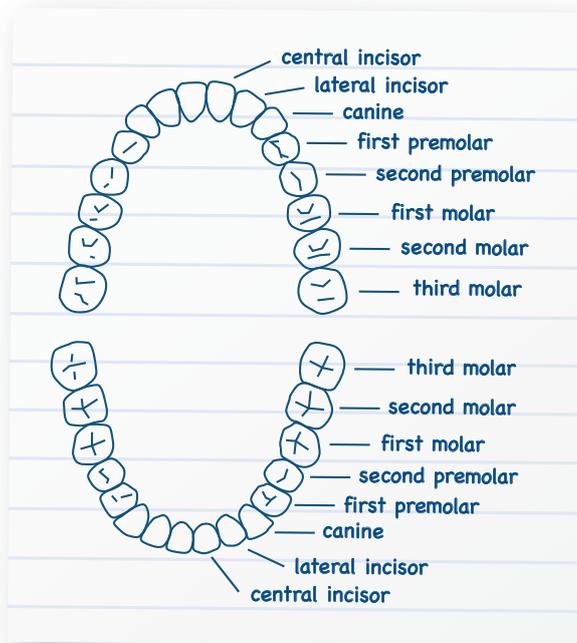
- ❖ two central incisors
- ❖ two lateral incisors
- ❖ two canines
- ❖ two first molars
- ❖ two second molars.

*Healthy deciduous teeth are important for:*

- ❖ efficient mastication of food – missing or badly decayed teeth may cause young children to reject foods that are difficult to chew
- ❖ maintaining normal facial appearance
- ❖ formulating and developing clear speech patterns
- ❖ maintaining space for and guiding the eruption of the permanent teeth
- ❖ jaw development
- ❖ developing self-esteem.

## Permanent teeth

Permanent teeth may also be referred to as second or adult teeth. Permanent teeth are more yellow in colour than deciduous teeth.

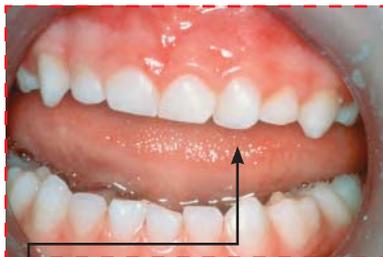


The upper arch (maxilla) and the lower arch (mandible) both have 16 permanent teeth:

- two central incisors
- two lateral incisors
- two canines
- four premolars
- six molars.

## Extra or missing teeth

Both the deciduous and permanent dentitions may have extra or missing teeth. Extra teeth are known as supernumerary teeth.



• *Supernumerary tooth*

## 2.5 Tooth eruption

### Eruption patterns

- Lower teeth usually erupt before the upper teeth.
- Girls usually precede boys in tooth eruption.
- The teeth in both jaws usually erupt in pairs – one on the right and one on the left.

### Deciduous teeth

Although deciduous teeth begin to form in utero, they do not usually begin to erupt until a child is six to eight months of age. Eruption times vary from child to child, just as the individual growth rate varies. Usually a child will have their full set of deciduous teeth by three years of age.

Usually, no teeth are visible in the mouth at birth, although occasionally some babies are born with an erupted incisor tooth known as a natal tooth. Some babies might also develop a neonatal tooth, which is one that erupts within 30 days of birth (Cameron & Widmer, 2003). For more information on natal and neonatal teeth, see Section Seven – Oral medicine.

### Usual eruption and exfoliation sequence for deciduous teeth

| Tooth                 | Eruption month<br>(approximately) | Shed year<br>(approximately) | Eruption sequence  |
|-----------------------|-----------------------------------|------------------------------|--|
| Lower central incisor | 6-10                              | 6-7                          | <p>The diagram illustrates the eruption sequence for deciduous teeth in both the upper and lower arches. It shows the following eruption times:</p> <ul style="list-style-type: none"> <li>Upper arch: 8-12 months (central incisors), 9-13 months (lateral incisors), 13-19 months (canines), 16-22 months (first molars), 23-31 months (second molars).</li> <li>Lower arch: 6-10 months (central incisors), 7-8 months (lateral incisors), 9-11 months (first molars), 10-16 months (second molars), 14-28 months (canines).</li> </ul> |
| Lower lateral incisor | 10-16                             | 7-8                          |  |
| Upper central incisor | 8-12                              | 6-7                          |  |
| Upper lateral incisor | 9-13                              | 7-8                          |  |
| Lower first molars    | 14-28                             | 9-11                         |  |
| Upper first molars    | 13-19                             | 9-11                         |  |
| Lower canines         | 17-23                             | 9-12                         |  |
| Upper canines         | 16-22                             | 10-12                        |  |
| Lower second molars   | 23-31                             | 10-12                        |  |
| Upper second molars   | 25-33                             | 10-12                        |  |

### Permanent teeth

At about six years of age, the first permanent molars and lower permanent incisors begin to erupt.

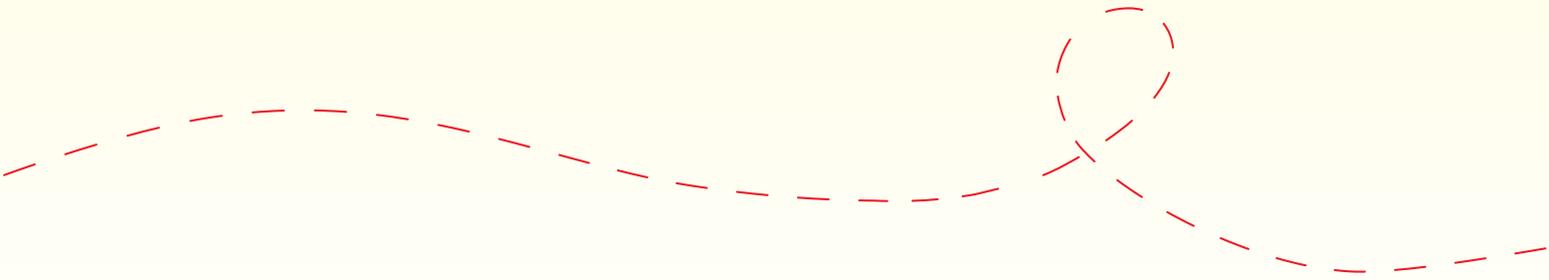
Between the ages of approximately six and 12 years, children have a mixture of permanent and deciduous teeth. This is known as a mixed dentition. By the age of 12, most children have all their permanent teeth except for the third molars (wisdom teeth).

When the permanent teeth are coming through:

- ✦ A child can sometimes find that chewing is more difficult when teeth are loose or missing.
- ✦ A child should keep their tooth-brushing routine. Extra care should be taken around loose teeth or sensitive areas.
- ✦ Loose teeth should be allowed to fall out on their own. If you try to pull out a tooth before it's ready to fall out, it can snap. This can cause pain and infection.
- ✦ Sometimes a permanent tooth will come through before the deciduous tooth has fallen out. If the deciduous tooth hasn't fallen out within two or three months, the child should see an oral health professional (Raising Children's Network 2009).

### Usual eruption sequence for permanent teeth

| Tooth                       | Year (approximately) | Eruption sequence |
|-----------------------------|----------------------|-------------------|
| Lower first molars          | 6-7                  |                   |
| Upper first molars          | 6-7                  |                   |
| Lower central incisor       | 6-7                  |                   |
| Lower lateral incisor       | 7-8                  |                   |
| Upper central incisor       | 7-8                  |                   |
| Upper lateral incisor       | 8-9                  |                   |
| Lower canines               | 9-10                 |                   |
| Upper first premolars       | 10-11                |                   |
| Lower first premolars       | 10-12                |                   |
| Upper second premolars      | 10-12                |                   |
| Lower second premolars      | 11-12                |                   |
| Upper canines               | 11-12                |                   |
| Lower second molars         | 11-13                |                   |
| Upper second molars         | 12-13                |                   |
| Third molars (wisdom teeth) | 17-21                |                   |



## 2.6 Teething

Teething refers to the eruption of the deciduous and permanent teeth. A child may feel discomfort as new deciduous teeth emerge, from about six months of age onwards.

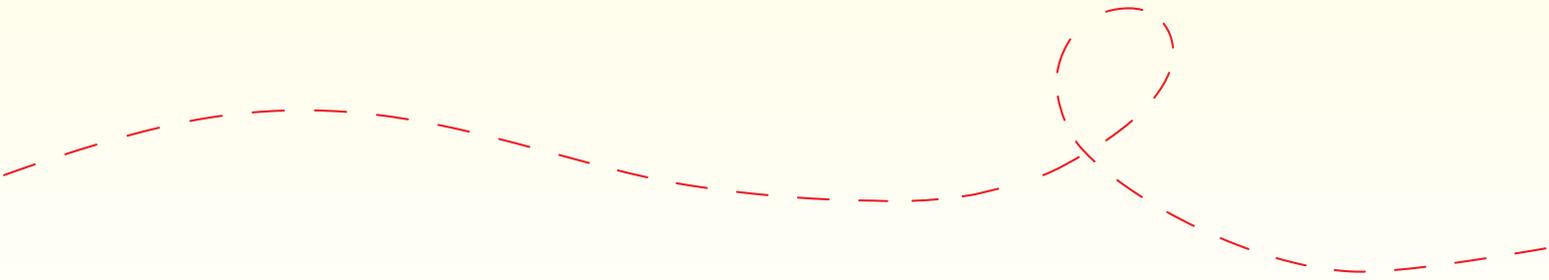
### ***Signs of teething may include:***

- ❖ irritability
- ❖ a child placing objects or fingers in their mouth and biting on them
- ❖ increased dribbling
- ❖ a child being choosy about foods or refusing foods altogether
- ❖ redness of cheeks
- ❖ swelling of gums
- ❖ restlessness by day, sleeplessness by night
- ❖ rashes on face or buttocks
- ❖ gums appearing red and swollen, and if pressed, may feel hard and pointed.

There has been much discussion and research around whether or not teething causes any adverse effects such as fever, diarrhoea, ear infections or other such illnesses. The literature does not support these claims and encourages parents and health professionals to investigate other possible causes to ensure that a potentially serious illness is not overlooked (Wake, Hesketh & Lucas 2000) (Macknin et al 2000).

### ***Temporary relief from teething discomfort:***

- ❖ Give the child something to bite on, such as a cold (but not frozen) teething ring, toothbrush or dummy.
- ❖ Give the child something firm to suck on, like a sugar-free rusk.
- ❖ A child may be more likely to accept soft food at this time as it requires less chewing.
- ❖ Gently rub the child's gums with a clean finger.



## 2.7 Tooth grinding (bruxism)

Babies can sometimes rub their gums together when new teeth are starting to erupt. Many children grind their teeth at some stage. Some children just clench their jaws quite firmly, while others might grind their teeth so hard that it makes a noise. Some children grind their teeth during sleep. Often, they don't wake up when they do it.

Most of the time, teeth grinding does not cause damage to a child's teeth and is temporary (Raising Children's Network 2009). Sometimes teeth grinding can cause wear facets.

Teeth grinding in infants and toddlers, and occasional teeth grinding in older children, does not require any intervention. However, if a child is experiencing headaches, tooth pain, jaw joint dysfunction or is wearing down the teeth, this should be discussed with an oral health professional (Mindell & Owens 2010). Devices to protect teeth can help and are available from oral health professionals.

## 2.8 Thumb and finger sucking

Finger, thumb or dummy sucking are common childhood habits. Many parents are concerned that these habits will affect their children's dental development.

Sucking of the thumb or fingers is a natural reflex in babies and young children. Most children grow out of finger sucking between two and four years of age. Tired, stressed or hungry children are likely to suck their thumb or fingers. The effects of thumb sucking are usually reversible up until the age of six or seven, because children still have their deciduous teeth. If thumb and finger sucking occurs beyond the age of six or seven, dental problems may arise including:

- ❖ **Buck teeth** – excessive sucking can push the front teeth out of alignment, causing teeth to protrude. This can alter shape of the face and lead to an open bite.
- ❖ **A lisp** – a child who sucks their fingers and thumbs can push their teeth out of their normal position. This interferes with the correct formation of certain speech sounds resulting in a lisp.

A lisp may also be created by a condition called tongue thrust, which is a habit of sealing the mouth for swallowing by thrusting the top of the tongue forward against the lips. Tongue thrust exerts pressure on the front teeth, increasing the likelihood that the teeth will be pushed out of their normal position and interfere with the correct formation of certain speech sounds. If tongue thrust is suspected, a referral to a speech pathologist is recommended.

### ***Thumb sucking versus a dummy or pacifier***

Parents will often ask, 'What is worse, thumb sucking or the use of a pacifier?' Studies of thumb suckers show they have a greater problem in breaking their habit than do dummy (pacifier) suckers (Adair 2003).

### ***Lip sucking***

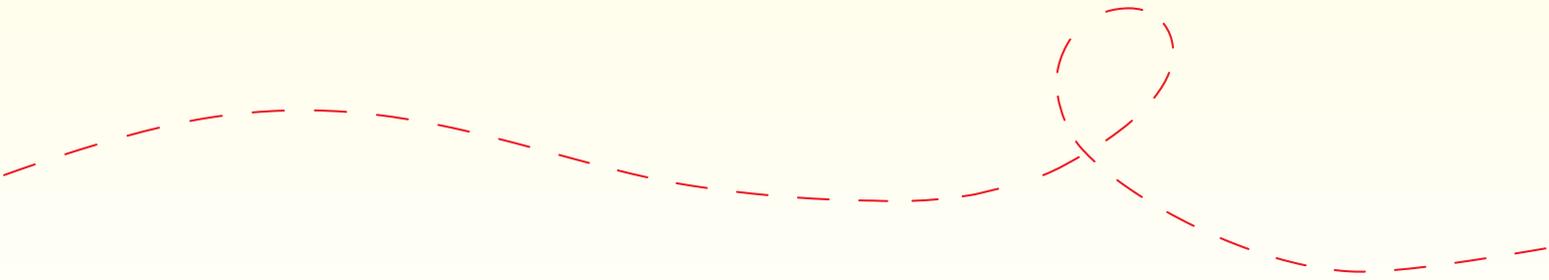
Sucking of the lower lip (lip sucking) may occur in isolation or it may occur with thumb sucking. When the lower lip is repeatedly held beneath the upper front teeth the result is usually an open bite.



*Open bite*



*Effects of lip sucking*



### **Discussion with parents and carers**

Sucking on fingers or thumbs is healthy and normal for infants. Most children stop somewhere between two and four years of age. Parents should encourage children to stop sucking their thumb or fingers and lip around that age, but this can be difficult as children need to have an understanding of the habit and want to stop before it will cease. Some tips for parents and carers to assist a child to break the thumb and finger sucking habit are outlined below (these strategies can also be adapted to lip sucking).

### **Tips for parents and carers to assist the child to break the thumb or finger sucking habit**

#### *Reward a child:*

- ✦ Use praise or a hug to reinforce their decision to stop the habit.
- ✦ Use ticks or stars on a calendar for each day or week the child does not suck their thumb or fingers. After the successful period, reward the child with a treat such as a surprise outing, a toy or a special privilege (food is not encouraged as a reward).
- ✦ The younger the child, the more frequently the reward may be required. Reward periods can gradually be stretched out. Some children do not lose the impulse to suck until they have collected as many as three or four rewards, which may take as long as three to four months.

#### *Offer encouragement:*

- ✦ Parents and other family members can offer encouragement. Family members need to be patient to assist children through their difficult time.
- ✦ Parents may choose to encourage a child to bond with their favourite toy.

#### *Limit nagging:*

- ✦ The frequent repetition by parents to take the child's thumb out of their mouth can be counterproductive. It is children, not parents, who must learn to control the habit. If children feel they are being nagged, they may become defensive.
- ✦ Occasional good humoured comments that bring the sucking activity to the child's notice can be helpful.

#### *Reminders:*

- ✦ Give the child a mitten to wear as a reminder not to suck, or apply unpleasant-tasting nail paint, (available from pharmacies) on the fingers or thumb.
- ✦ Place a band-aid over the thumb at bedtime.

#### *Offer distractions:*

- ✦ While a child is watching TV, have toys available to play with.
- ✦ Sit with a child during TV time and give them a cuddle (another form of comfort).
- ✦ For car rides, have toys and books available to keep their hands occupied.

Children can easily drift back to their old habit and it may take several attempts before the habit is completely broken. Remember that patience is the key, and that a child's first days without sucking are usually the most difficult. Like all habits, the yearning slowly diminishes and it eventually becomes easier to control. Effective methods will vary according to each child and their situation.



## 3. Mouth Checks

### This section covers:

- 3.1 Lift the lip
- 3.2 Healthy mouth checks
- 3.3 Identifying dental caries
- 3.4 Anticipatory guidance for parents and carers at each of the maternal and child health key ages and stages consultations

When conducting mouth checks at the 8 month, 18 month and 3.5 year consultations, or any of the key ages and stages consultations, please refer to 'Healthy mouth checks' (3.2) and 'Anticipatory guidance for parents and carers at each of the maternal and child health key ages and stages consultations' (3.4). Parents should be aware that this is just a check and they still need to take their child to see an oral health professional.

Maternal and child health nurses are encouraged to refer children to an oral health professional at the two-year visit.

An immediate referral to an oral health professional is recommended where the maternal and child health nurse identifies an oral health problem.

### 3.1 Lift the lip

Maternal and child health nurses are encouraged to lift-the-lip, look, and locate:

- ✦ lift-the-lip to view inside the mouth
- ✦ look at the tooth surfaces
- ✦ locate an oral health professional if a problem is identified.

It is important to get a child into the correct position before examining their mouth. This position varies depending on the age of the child.

The technique shown here (lap to lap) is an effective way for parents and health professionals to view young children's teeth.



### ***Infants or toddlers (Birth – three years of age)***

The lap-to-lap position works well when conducting a mouth check on an infant or toddler, allowing you to get a reasonable view of the child's mouth.

1. Sit opposite the child's parent with your knees touching. The child should be positioned in their parent's lap, facing their parent.
2. Slowly lower the child's head onto your lap so that the top of his or her head is against your tummy.
3. You are now ready to begin the mouth check.



*Photos courtesy of New Zealand Dental Association*

Infants and toddlers may resist attempts to look in their mouths and may not keep them open long enough for you to perform the check. Some children will allow the use of a tongue depressor, while other children may become upset. The parent should be warned in advance of using a tongue depressor.

### ***Older children (from three years of age)***

1. Place the child in a position that will allow a reasonable view of the mouth. Children can lie on an examination table or sit in front of you. Ask the child's parent to stand next to or behind the child and assist in positioning them if needed.
2. Ask the child to open their mouth wide.
3. Ask the child to move their tongue in different directions and say, 'ahh', (this depresses the tongue for a full view of the back of the mouth). If needed, use a tongue depressor or flashlight.
4. For a close look at the buccal mucosa (inside of the cheek), ask the child to use their fingers to move the outer lip and cheek to one side.



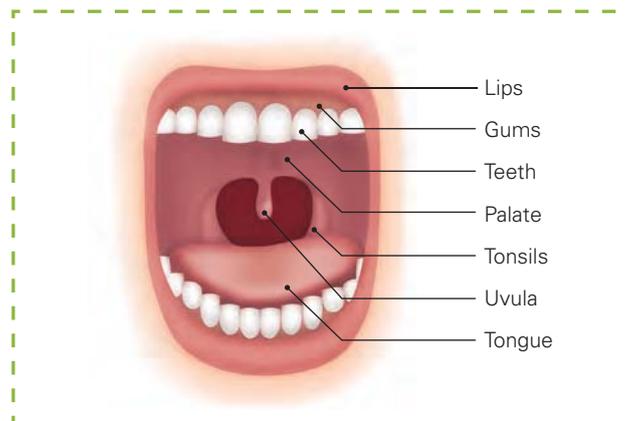
## 3.2 Healthy mouth checks

Listed below are some points of reference for you to consider when conducting mouth checks. Please look at these each time you complete a mouth check.

### **A healthy mouth**

Some of the major structures that are visible when looking inside the mouth include:

- lining of the lips
- cheeks
- gums
- teeth
- tongue
- palate
- uvula
- tonsils.



### **Signs of a healthy mouth**

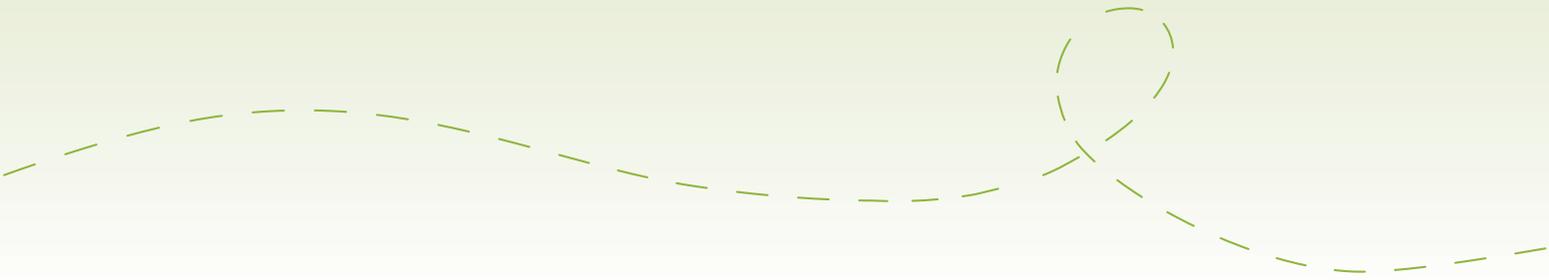
- The mucous membranes that line the lips, cheeks, palate and underside of the tongue should be pink, smooth, glistening, uniform and moist.
- If teeth are present they should be whitish in colour, smooth and free of plaque (a sticky soft film which forms on teeth which contains bacteria). The number of teeth present is also important (for eruption times see Section 2 — Tooth Development).
- The gums should be pink and stippled. In dark skinned children the gums are more deeply coloured and a brownish area is often observed along the gum line.
- The tongue should have papillae (small projections that contain several taste buds), which give the tongue its rough appearance.
- The roof of the mouth consists of the hard palate near the front of the cavity, and the soft palate towards the back of the pharynx, which has a small midline protrusion called the uvula. The arch of the palate should be dome shaped (Hockenberry et al 2003).



*Healthy infant's mouth*



*Healthy child's mouth (age five years)*



***What to look for during a mouth check:***

- ☞ Does the mouth look healthy? (See 'Signs of a healthy mouth').
- ☞ Present and erupting teeth (see Section Two — Tooth Development).
- ☞ Number of teeth — is the number within the average range for age? (See Section Two — Tooth Development).
- ☞ Look at the teeth, the neck of the upper front teeth and the gum lines for any discolouration or stains, specifically chalky white spots or patches, or yellowish or brownish discolouration.
- ☞ Are there any clearly visible holes?
- ☞ Oral hygiene status — check for visible plaque build up (usually visible on the top front teeth) and odour.
- ☞ Any unusual lumps, sores or abscesses (see Section Seven — Oral Medicine).
- ☞ Is the child suffering from any oral pain?

It is anticipated that maternal and child health nurses will refer anything of concern to an oral health or medical professional (see Section Eight — Dental Services and Contacts).

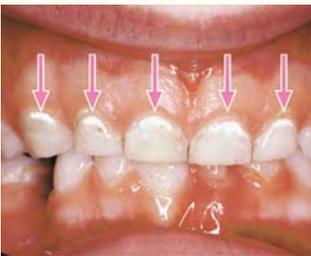
### 3.3 Identifying dental caries



#### ***A healthy mouth***

Pink gums indicate a healthy blood supply.  
Teeth are not discoloured.

Upper and lower teeth meet each other when biting.



#### ***First stage of caries***

The upper incisors develop a dull white band (demineralisation) along the gum line, which usually goes undetected by the parents or carers. This first stage of caries is called a white spot lesion and is reversible.

Refer to an oral health professional.  
Encourage good oral hygiene practices.

*Photo is courtesy of South Australian Dental Service*



#### ***Early stages of caries***

Some brown spots on teeth, redness and swelling of gums.

Refer to an oral health professional.  
Encourage good oral hygiene practices.



#### ***Advanced stages of caries***

Blackened areas and very red and inflamed gums.

This level of caries can lead to the removal of teeth.  
Refer to an oral health professional.

### 3.4 Anticipatory guidance for parents and carers at each of the maternal and child health key ages and stages consultations

To support maternal and child health nurses in oral health education, tooth tips for parents, grandparents and carers, which cover key oral health information from 0-12 months, 12-18 months and 18 months to six years, are provided as a part of the following key ages and stages consultations:

- ✦ eight-month consultation – tooth tips 0-12 months
- ✦ twelve-month consultation – tooth tips 12-18 months
- ✦ eighteen-month consultation – tooth tips 18 months -6 years.

*The tooth tips are also available in Arabic, Vietnamese, Chinese, Somali, Turkish and Macedonian on the Dental Health Services Victoria website: [www.dhsv.org.au](http://www.dhsv.org.au).*

Listed below are some of the important oral health topics that may be discussed during the different key ages and stages consultations with parents and carers.

#### ***Birth to four months***

##### ***Early identification***

- ✦ The oral cavity — does it look healthy?
- ✦ Palate structure — inspect both the hard and soft palate to ensure they are intact. Look for any clefts.
- ✦ Tongue tie.
- ✦ Oral thrush.
- ✦ Natal and neonatal teeth.
- ✦ Epstein's pearls.
- ✦ Bohn's nodules.
- ✦ Any unusual lumps or sores.

See Section Seven – Oral Medicine for more information on these conditions.

##### ***Feeding patterns***

- ✦ A relevant discussion would be around early feeding.

##### ***Dummies***

- ✦ Do not dip the dummy in any foodstuffs or liquids.

Refer to the Maternal and Child Health Practice Guidelines.



## **Four to 18 months**

### **Teething**

- Indicate eruption sequence.
- Strategies for relieving the symptoms of teething.

See Section Two – Tooth Development for more information on these topics.

### **Feeding patterns**

- Warn against using the bottle or breast as a comforter.
- Discourage sweet drinks in the bottle.
- Avoid prolonged periods with the bottle in the mouth, especially at night and during sleep. The key concern is the frequency of sugar intake and the period of time that the teeth remain in contact with sweet or acidic foods and drinks.

### **Solids**

- Sugar, salt and fat should not be added to solid foods.

### **Introducing the cup**

- Recommend introduction of a cup from the age of six months.
- A bottle should be discontinued at 12 months.

### **Dummies**

- Do not dip the dummy in any foodstuffs or liquids (see Section Six – Dental Disease and Trauma for more information on early childhood caries and dummies).
- Encourage weaning from dummy at 12 months.

### **Cleaning teeth**

- Start cleaning children's teeth twice a day as soon they erupt (after meals and before bed).
- Wrap a clean, damp face washer or gauze around a finger and wipe the front and back of each tooth.
- A small, soft toothbrush may be introduced as tolerated. Only use water on the toothbrush until 18 months of age (unless otherwise recommended by an oral health professional). A low-fluoride toothpaste can be introduced at 18 months.

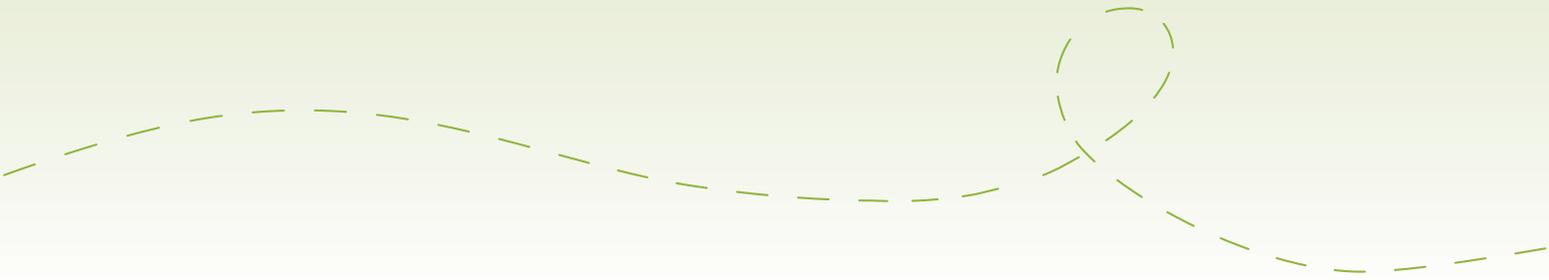
### **Dental visits**

- Advise parents on the importance of dental visits.

### **Injury prevention**

- Warn about injuries to the face and teeth once the child is pulling themselves up onto things and learning to crawl, walk and run.

Refer to the Maternal and Child Health Practice Guidelines.



## ***Eighteen months to three years***

### ***Teething***

- Indicate eruption sequence.
- Strategies for relieving the symptoms of teething.

See Section Two – Tooth Development for more information on these topics.

### ***Appropriate use of the bottle***

- Discontinue the bottle and encourage the use of a cup as the main drinking vessel.

### ***Nutritious snacks and drinks***

- Encourage water as the preferred drink for thirst.
- Encourage nutritious foods as snacks. The key factor in dental caries is frequency of sugar intake and the period of time that the teeth remain in contact with sweet or acidic foods.

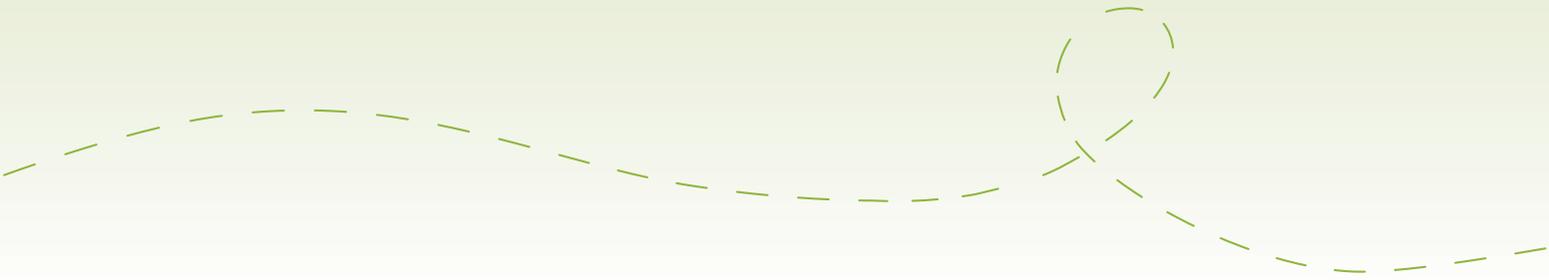
### ***Dummies***

- Encourage complete weaning from the dummy.
- Do not dip the dummy in any foodstuffs or liquids.

### ***Cleaning teeth***

- Encourage use of a small, soft toothbrush.
- When a child reaches 18 months of age it is the optimum time to commence the use of low-fluoride (400–550 ppm) toothpaste. Fluoride in toothpaste prevents dental caries at all ages, but when used before the age of 18 months, much of the toothpaste may be swallowed, which increases the risk of dental fluorosis (mottling) (see Section Five – Fluoride).
- A pea sized amount of low-fluoride toothpaste should be smeared onto the toothbrush. Children should be encouraged to spit the toothpaste out and not swallow it and not rinse their mouth with water afterwards. Guidelines set by the Australian Research Centre for Population Oral Health (2006) state that:

*For children who do not consume fluoridated water or who are at elevated risk of developing caries for any other reason, guidelines about toothpaste usage should be varied, as needed, based on dental professional advice. Variations could include more frequent use of fluoridated toothpaste, commencement of toothpaste use at a younger age, or earlier commencement of use of standard toothpaste containing 1mg/g (1000 ppm) fluoride.*



### *Thumb or finger sucking*

- Reassure parents and carers that non nutritive sucking is normal, and that children usually stop the habit between two and four years of age.

(see Section Two – Tooth Development).

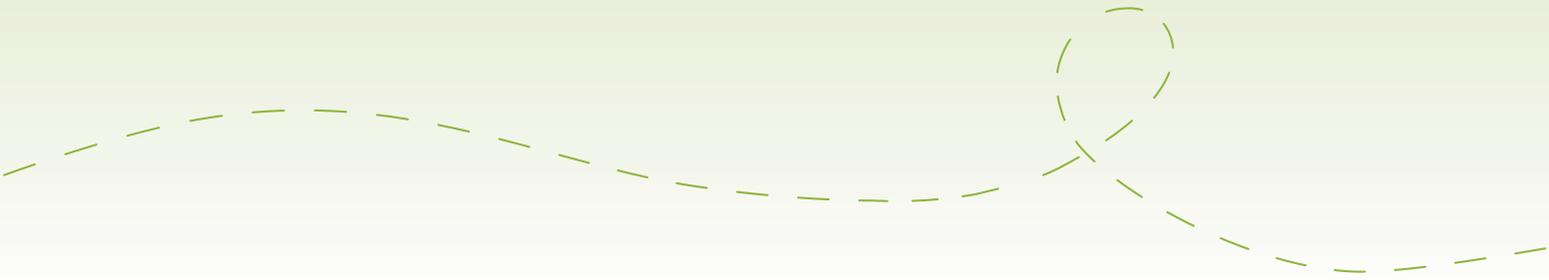
### *Dental visits*

- Two years of age is a good time to take a child to see an oral health professional. These early visits can create a positive experience for both child and parent and help with early diagnosis and prevention of oral disease. The oral health professional will recommend how regular visits should be.
- Suggest that the parent take the child with them when having a check up, or with older brothers and sisters for their check up.
- This visit can be a positive experience for the child and allows parents to ask questions relating to the child's dental development.
- At this visit the oral health professional will be able to advise on oral hygiene, diet and future use of sealants.

### *Injury prevention*

- Warn about injuries to the face and teeth once the child is walking, running and climbing.

Refer to the Maternal and Child Health Practice Guidelines.



### ***Three to school age***

#### ***Appropriate use of the bottle***

- ☛ If the bottle is still in use, discuss strategies for complete weaning.

#### ***Nutritious snacks and drinks***

- ☛ Encourage nutritious snacks and drinks.
- ☛ Encourage water as the preferred drink.

#### ***Dummies***

- ☛ If a dummy is still in use, discuss strategies for complete weaning.
- ☛ Do not dip the dummy in any foodstuffs or liquids.

#### ***Cleaning teeth***

- ☛ Encourage use of a small, soft toothbrush designed for children.
- ☛ Encourage the use of a low-fluoride toothpaste for children aged between 18 months and six years, unless otherwise recommended by an oral health professional.
- ☛ A pea sized amount of low-fluoride toothpaste should be smeared onto the toothbrush. Children should be encouraged to spit the toothpaste out and not swallow and not rinse their mouth with water afterwards.
- ☛ Parents should brush their children's teeth up to the age of six or seven years. Children's fine motor skills are not sufficiently developed until this age. A good indication of sufficient dexterity to brush teeth can be when a child is able to tie their own shoelaces.

#### ***Thumb or finger sucking***

- ☛ May cause orthodontic problems if it continues after the permanent teeth begin to erupt (at about six to seven years of age). Tips for parents and carers to assist children to break the thumb or finger sucking habit can be found in Section Two – Tooth Development.

#### ***Dental visits***

- ☛ Outline the importance of visiting an oral health professional regularly.

#### ***Injury prevention***

- ☛ Warn about injuries to the face and teeth during play and at other times.

Refer to the Maternal and Child Health Practice Guidelines.



## 4 Promoting Individual Oral Health Practices

### This section covers:

- 4.1 Importance of establishing good oral health practices at an early age
- 4.2 Diet and nutrition
- 4.3 The value of dental visits and at what age they should begin
- 4.4 The importance of mother's oral health during and after pregnancy

The tooth tips for parents, grandparents and carers (0-12 months, 12-18 months and 18 months to six years) have been developed for maternal and child health nurses to provide to parents as part of a discussion of these practices. These have been made available at the 8-month consultation, the 12-month consultation and the 18-month consultation.

*The tooth tips are also available in the following languages – Arabic, Vietnamese, Chinese, Somali, Turkish and Macedonian on the Dental Health Services Victoria website [www.dhsv.org.au](http://www.dhsv.org.au).*

### 4.1 Importance of establishing good oral health practices at an early age

Early childhood is when many lifetime habits are established. It offers the opportunity to prepare for good health in later years. As young children grow and develop they are constantly exposed to new experiences and they respond by developing new behaviours and skills. Through the socialisation of a child, parents and carers can influence behaviours in early life, which can then be carried into adulthood. This includes establishing good health behaviours, such as sound oral hygiene practices. Thorough tooth brushing is required for the maintenance of healthy teeth and gums. An important aspect of brushing infants' and toddlers' teeth is the establishment of a regular habit from an early age.

#### **Infants**

As soon as the first tooth appears, cleaning may begin. Using a damp piece of gauze or a damp face washer wrapped around a finger, wipe each tooth's front and back. Infant teeth should be cleaned at least twice each day, after meals and before bed. At approximately 12 months of age a toothbrush designed for children (small head and soft bristles) can be introduced. Cleaning with a damp toothbrush may be introduced sooner if accepted by the infant.



### **Toddlers and preschool children**

As most children have insufficient manual dexterity to brush effectively until they are at least six or seven years of age, parents should help children to brush their teeth until they are old enough to do it properly by themselves.

**A good indication of sufficient dexterity to brush teeth can be when a child is able to tie their own shoelaces.**

- ✦ The best way to brush young children's teeth is to sit the child on your lap or to stand behind the child, tilting the child's head upwards so that all tooth surfaces can be seen. Using a small soft toothbrush, brush all surfaces of teeth using a gentle scrubbing motion.
- ✦ Eighteen months of age is the optimum time to start using toothpaste. Fluoride in toothpaste prevents dental caries at all ages, but when used before the age of 18 months much of the fluoride may be swallowed, which increases the risk of dental fluorosis (see Section Five – Promoting Population Oral Health – Fluoride).
- ✦ A pea sized amount of low-fluoride toothpaste should be smeared onto the toothbrush. Children should be encouraged to spit the toothpaste out and not swallow it and not rinse their mouth with water afterwards (ARCPOH 2006).

*For children who do not consume fluoridated water or who are at elevated risk of developing caries for any other reason, guidelines about toothpaste usage should be varied, as needed, based on dental professional advice. Variations could include more frequent use of fluoridated toothpaste, commencement of toothpaste use at a younger age, or earlier commencement of use of standard toothpaste containing 1mg/g (1000ppm) fluoride (ARCPOH 2006).*

## 4.2 Diet and nutrition

### ***For newborns and infants***

#### ***Breastfeeding***

Exclusive breast feeding is recommended up to six months of age. Infant formula is the only alternative if a mother is partially or no longer breastfeeding. It is recommended that mothers then continue breastfeeding until the infant is 12 months of age, and further continued if both mother and infant wish (NHMRC 2003).



#### ***Bottle-feeding***

When bottle-feeding with infant formula or expressed breast milk, appropriate use of a bottle should be encouraged. Recommendations include:

- ✦ Babies need to be bottle fed by an adult. When feeding is complete, the bottle should be taken away.
- ✦ The bottle should only contain breast milk or appropriate infant formula.
- ✦ Do not dip pacifiers or bottle teats in sugar or honey.
- ✦ A cup should be introduced from six months of age. A bottle is not necessary after the age of 12 months.

#### ***Solid foods***

Solid foods should be introduced at around six months of age, as an infant's nutritional needs (particularly iron) may no longer be sufficiently met by exclusive breast feeding or infant formula, and their development and digestion is better able to manage other foods.

A wide variety of foods may be introduced to infants starting on solids. It's a good idea to encourage parents to use iron-fortified cereals and avoid adding salt, sugar, fat or other flavour to foods. Introducing foods one at a time is also a useful way of easily identifying a possible intolerance or allergy should one exist.

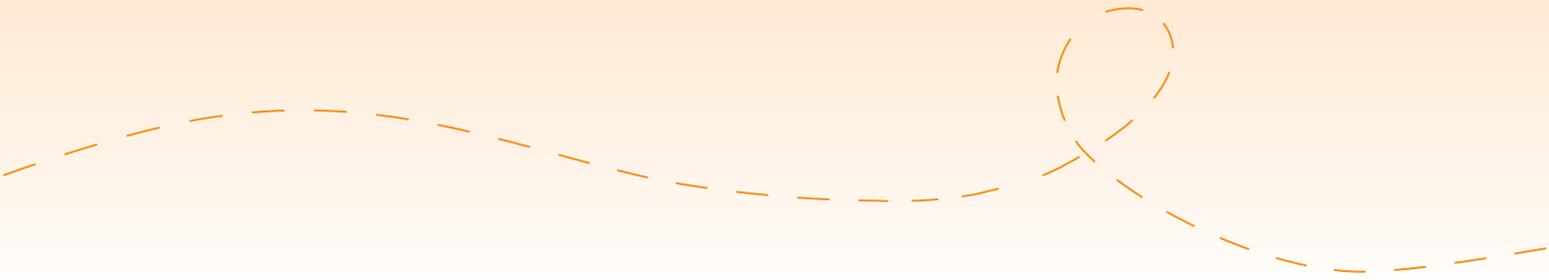
When introducing solids, it is important for parents to create a positive environment. At this stage, solids are a learning activity for the baby – and breast milk or infant formula will still likely be meeting their needs. If an infant is not interested in a food, they should not be forced to eat it, and parents should allow the infant's appetite to dictate their needs.

Caution must be taken with hard foods, as choking is still a risk (Department of Health and Ageing 2009).

### ***For toddlers and children***

Eating a wide variety of nutritious foods is important, especially during childhood when growth and development are occurring. Childhood is a time when eating and drinking habits are established, so it is important for parents and carers to encourage healthy eating and drinking behaviours (NHMRC 2003). Parents should be encouraged to create a positive atmosphere around mealtimes, and not force their child to eat. Often, foods will need to be introduced repeatedly before a child will try it.

Frequent consumption of sweet sticky foods can contribute to dental caries (DHS 2000). Foods and drinks containing added sugars should be limited, especially between meals. If consumed, they are best eaten at mealtimes (DHS 2003).



### ***Encourage water consumption***

Children should be offered water as the drink of choice most of the time to develop the preferred habit over the longer term.

The frequent exposure of teeth to any acidic food or drink may cause loss of enamel by dental erosion. As sweet drinks are acidic in nature they should be limited especially between meals. Sweet drinks may also reduce a child's appetite for nutritious foods. Sweet drinks include fruit juices, soft drinks and cordials, either bought or home made.

### ***Foods and drinks to encourage***

From 12 months of age, children can start eating family foods and meals on plates. For good nutrition, children need to eat a variety of foods from the following food groups each day:

- ✦ breads, cereals, rice, pasta, noodles and other grains
- ✦ vegetables and legumes
- ✦ fruit
- ✦ milk, yoghurt, cheese and/or alternatives (reduced-fat dairy products are not suitable for children under two years)
- ✦ lean meat, fish, poultry, eggs and legumes.

### ***Foods and drinks to limit***

- ✦ sweetened breakfast cereal
- ✦ fruit bars and strips
- ✦ muesli and health bars high in sugar
- ✦ cake and cake icing
- ✦ biscuits
- ✦ chocolate and lollies
- ✦ sweet spreads (such as jam, honey, hazelnut spread)
- ✦ hot chips and crisps
- ✦ meat pies and sausage rolls
- ✦ ice cream, dairy dessert
- ✦ fruit juice, cordial, soft drinks.

*For further information, please refer to the 'Dietary Guidelines for Children and Adolescents in Australia', incorporating the 'Infant Feeding Guidelines for Health Workers'. These can be found on the National Health and Medical Research Council website: [www.nhmrc.gov.au](http://www.nhmrc.gov.au).*

### 4.3 Visiting an oral health professional

Oral examinations completed by an oral health professional for children as early as two years of age are beneficial to promote good oral health practices and to facilitate early identification of oral health problems.

Maternal and child health nurses are encouraged to refer children to an oral health professional at the two-year visit. An immediate referral to an oral health professional is recommended where the maternal and child health nurse identifies an oral health problem. The oral health professional will recommend how regular visits should be.

For many children the first dental visit is about becoming familiar with the dental setting. The following information may be useful when discussing the first dental visit with the parents.

- ✦ Suggest the child accompany the parent to visit the oral health professional.
- ✦ Help children to accept that dental visits are part of a regular routine.
- ✦ Make the child's appointment for early in the day so that the child is not tired.
- ✦ Arrive a little before the appointment time, to let the child become familiar with the new surroundings.
- ✦ Suggest the parent talk to the child about the dental visit in a positive way, avoiding language such as 'be brave'. Explain to the child that the oral health professional will give them a ride in the chair and count their teeth.
- ✦ Encourage parents to be a passive observer and allow the staff to capture the child's full attention.
- ✦ It is not necessary to bribe children to see an oral health professional, nor for children or parents to feel anxious.



## 4.4 Mother's oral health

It is important for mothers to look after their own oral health during and after pregnancy. Studies have found an association between a mother's oral health status and that of her child. A mother's mutans streptococci count, active decay and sugar consumption are strong risk indicators for children's caries (Smith et al 2002; Thorild, Lindau Jonson & Twetman 2002).

### **Oral health during pregnancy**

During pregnancy, women can experience an increased risk of gingivitis (early gum disease), erosion and dental caries associated with normal hormone changes.

Research suggests that there is a link between severe gum disease in an expectant mother and an increased risk of a premature birth and/or low birth weight for her baby (Clothier, Stringer & Jeffcote 2007). An association has also been demonstrated between moderate to severe periodontitis in early pregnancy and an increased risk of spontaneous preterm birth, independent of other risk factors (Jeffcote et al 2001) (Offenbacher et al 2006). More recently, research by Canakci et al. (2004) has identified an association between maternal periodontal health and higher incidence of preeclampsia, which most commonly causes high blood pressure and protein in the urine (Better Health Channel 2008b).



Common signs of gum disease include:

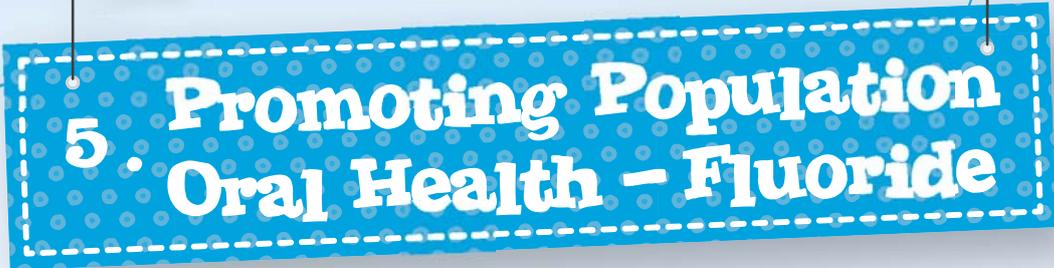
- ❗ bleeding gums
- ❗ red gums (instead of pink)
- ❗ swollen gums
- ❗ bad breath.

It is therefore important for mothers to:

- ❗ maintain good oral hygiene practices during pregnancy
- ❗ maintain a low-sugar diet
- ❗ consume adequate calcium and vitamin D for optimal development of their babies' teeth and bones
- ❗ visit an oral health professional
- ❗ seek dental or medical advice for prolonged vomiting, as this may lead to erosion or dental caries (Dental Practice Education Research Unit 2004).

Visiting an oral health professional while pregnant is highly recommended. A regular check-up is an important routine to develop for mother and child.

Pregnant women who have a current concession card do not have to go on a waiting list to see a public oral health professional and will be given the next available appointment. To find the nearest community dental clinic call 1300 360 054 or visit [www.dhsv.org.au](http://www.dhsv.org.au).



## 5 Promoting Population Oral Health – Fluoride

### This section covers:

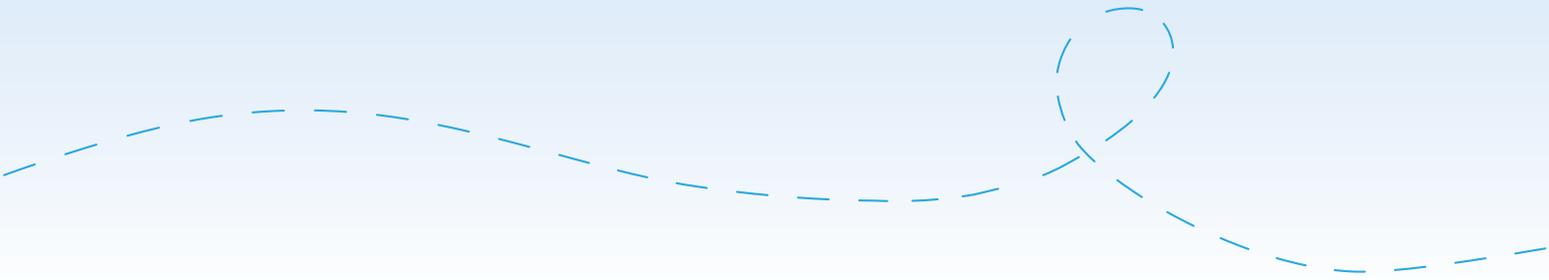
- 5.1 What is fluoride?
- 5.2 The role of fluoride in oral health
- 5.3 Fluoride in toothpaste
- 5.4 Fluoride supplements
- 5.5 Water fluoridation
- 5.6 Water filters
- 5.7 Safety of fluoride
- 5.8 Dental fluorosis
- 5.9 Fluoride and infant formula.

The majority of the information in 'The role of fluoride in oral health' (5.2), 'Water fluoridation' (5.5) and 'Dental fluorosis' (5.8) has been adapted from the Department of Human Services document Water Fluoridation – Information for Health Professionals (2008).

For more information on fluoride, visit: [www.health.vic.gov.au/environment/fluoridation/index](http://www.health.vic.gov.au/environment/fluoridation/index)

The following resources can be found on that website:

- Water Fluoridation – Consumer Information Booklet.
- Water Fluoridation – Information for Health Professionals.
- Water Fluoridation – Question and Answer Sheet.



## 5.1 What is fluoride?

Fluoride is a naturally occurring compound found:

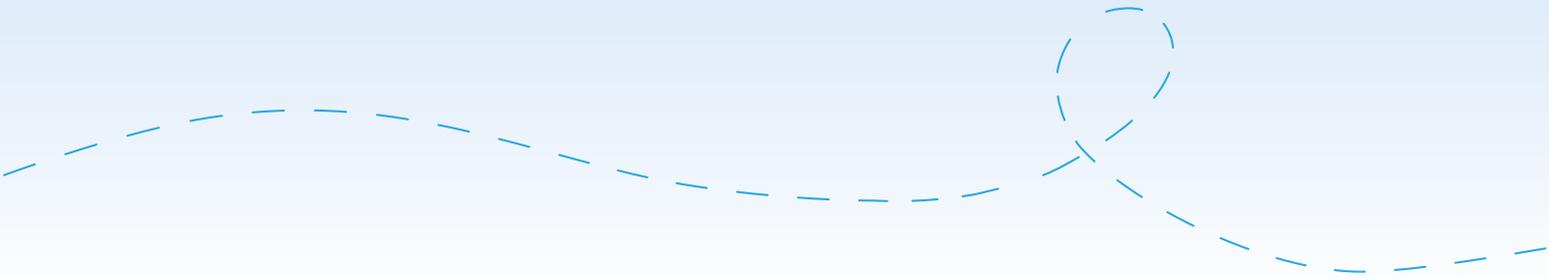
- in plants, rocks and at very low levels in almost all fresh water
- in virtually all foodstuffs, in trace amounts
- naturally at a beneficial level in the local water supplies of some Victorian communities, and added to some community water supplies to achieve optimal levels, assisting in the prevention of dental caries (DHS 2009a).

There is almost no fluoride present in breast milk. 'Fluoride is poorly transported from plasma to milk and concentrations of fluoride in milk remain low even when the intake of fluoride by the woman is high' (Fejerskov, Ekstrand & Burt 1996).

## 5.2 The role of fluoride in oral health

Fluoride protects both developing and erupted teeth against caries, and therefore benefits individuals of all ages. The presence of fluoride in the pre-eruptive phase is incorporated into developing tooth structure where it renders the tooth more resistant to later acid attack.

In the post-eruptive phase, fluoride acts as a constant 'repair kit' for teeth, after its redistribution into saliva. Dental caries develops when sugars from food and drinks are metabolised by bacteria in the mouth, resulting in acid production at the tooth surface. Following acid attack and the subsequent removal of calcium and phosphate from the tooth surface (the process known as demineralisation), the fluoride in saliva interacts with these minerals and salts at the tooth surface to remineralise the damaged enamel. A constant supply of a low level of fluoride within the saliva is beneficial for replacement of lost minerals and therefore reduction of dental caries.



### 5.3 Fluoride in toothpaste

Fluoridated toothpaste is effective in the prevention of dental caries. 'In countries where toothpaste use is widespread, fluoride toothpastes are probably the most important method for the topical application of fluoride' (Chu, Mei & Lo 2010).

The most common concentration of fluoride used in toothpaste is 1,000 ppm (parts per million), although toothpastes for adults may include concentrations of 1,500 ppm or more. These higher fluoride concentration toothpastes are available for use under the direction of an oral health professional. Low-fluoride concentration toothpastes typically contain 400–500 ppm and are designed for younger children aged from 18 months up to six years.

### 5.4 Fluoride supplements

Fluoride supplements in the form of drops or tablets have been used in the past as a substitute for water fluoridation for children in non-fluoridated areas (ARCPOH 2006). Due to the high risks of dental fluorosis, the current recommendation is that fluoride supplements should not be used at all, whether drinking water is fluoridated or not (DHS 2008).

### 5.5 Water fluoridation

Water fluoridation is the adjustment of the natural amount of fluoride in the water supply to a level recommended for optimal dental health benefits. Natural levels of fluoride in water supplies tend to be lower than the optimal level recommended for the prevention of dental caries.

There is an overwhelming weight of scientific evidence that supports the safety and effectiveness of water fluoridation. It has been endorsed worldwide by numerous organisations including:

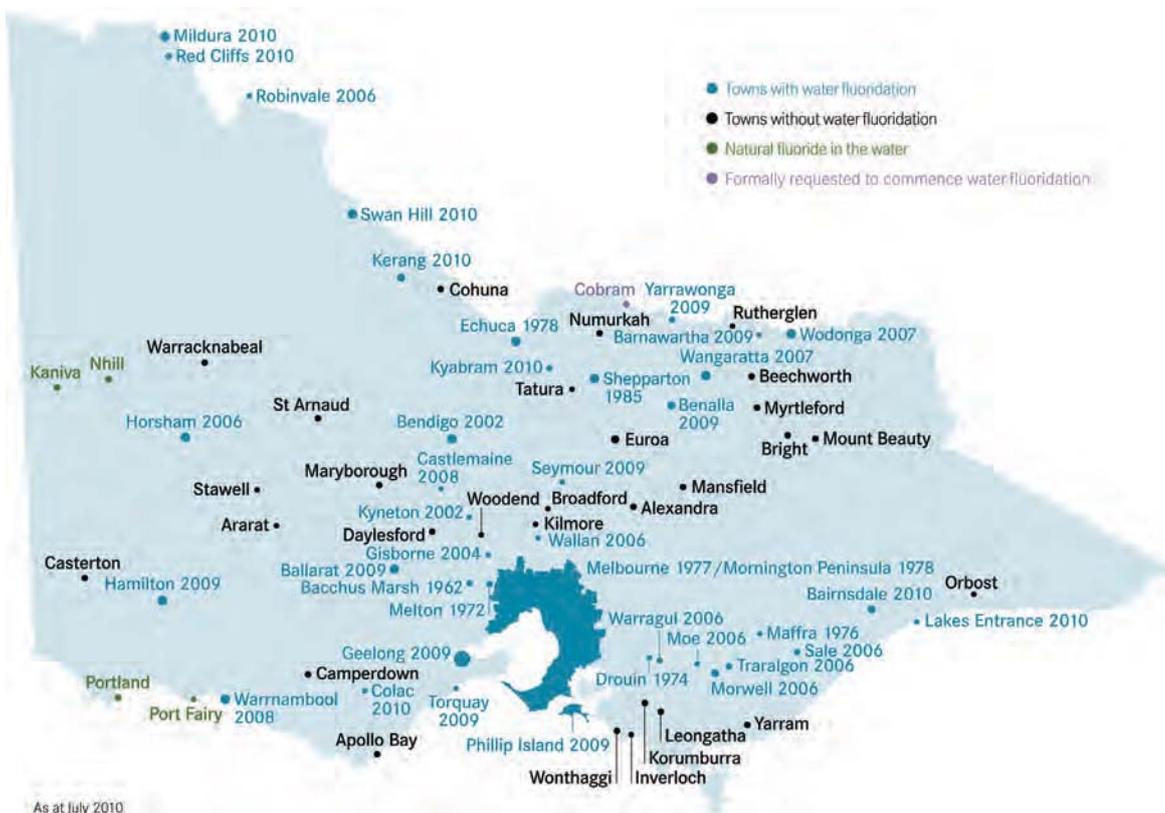
- ✦ World Health Organization
- ✦ World Dental Federation
- ✦ National Health and Medical Research Council
- ✦ Australian Dental Association
- ✦ Australian Medical Association
- ✦ Public Health Association of Australia (DHS 2008).

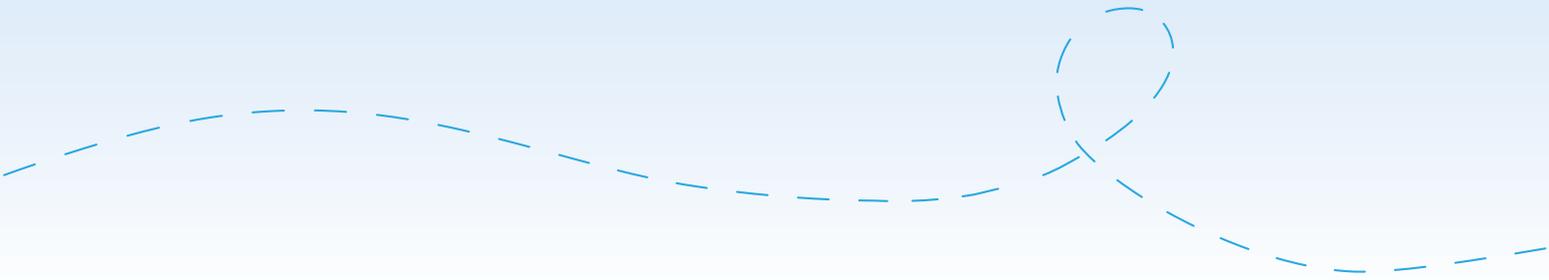
Water fluoridation benefits individuals regardless of age or education and reduces the socioeconomic inequalities in dental caries experience (DHS 2008). Studies of children and adolescents in the late 20th century reveal that lifetime exposure to water fluoridation had reduced caries by 20 to 40 per cent (ARCPOH 2006).

Australia has fifty years of experience with community water fluoridation following the introduction of the first program in 1953 in Beaconsfield, Tasmania. More than three quarters of Victorians have water with either naturally occurring or added fluoride; Figure 1 depicts the pattern of fluoridation within Victoria.

Since the introduction of community water fluoridation to metropolitan Melbourne in 1977, the caries prevalence within Victoria has markedly decreased. Dental Health Services Victoria data indicates that children under the age of five in fluoridated areas of Victoria have 19 per cent less caries experience in the deciduous dentition than those in non fluoridated areas. That difference increases to 28 per cent by the time children have reached six years of age (DHSV 2010a).

*Figure one: water fluoridation in Victoria (as at July 2010)*





## 5.6 Water filters

Some water filters may remove fluoride, so it is important to check the type of filter with the manufacturer or supplier. The Australian Dental Association (2007) advises that this is limited to those filters with:

- ▣ reverse osmosis
- ▣ distillation
- ▣ ion exchange.

Normal membrane filters will not remove a small ion such as fluoride (Cameron & Widmer 2003). These include:

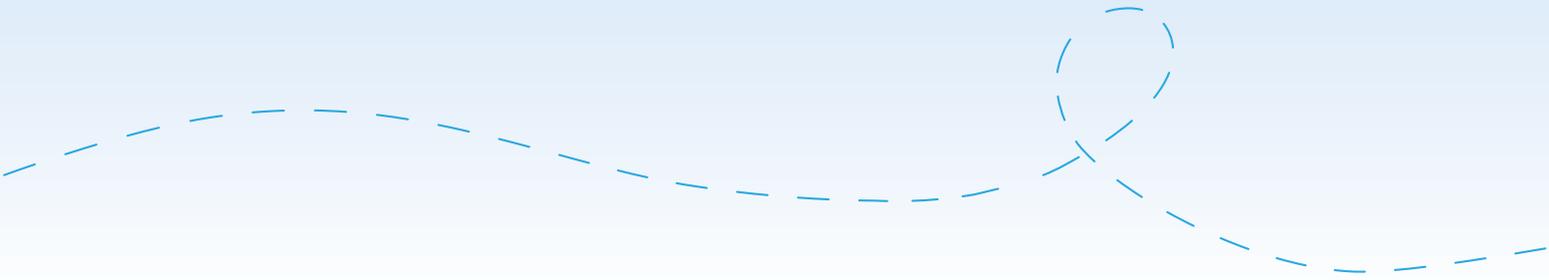
- ▣ carbon filters
- ▣ ceramic filters.

As the adjustment of fluoride in drinking water to around 1 mg/L is a safe and effective way to help protect teeth against dental caries, it is not necessary to use a water filter to remove the fluoride. It is therefore a personal choice to drink non-fluoridated water when the drinking water supply is fluoridated (DHS 2009a).

## 5.7 Safety of fluoride

With the exception of dental fluorosis, scientific studies have been unable to link community water fluoridation with adverse effects. The World Health Organization (1994) has concluded that 'community water fluoridation is safe and cost effective and should be introduced and maintained wherever socially acceptable and feasible'.

Fluoridated toothpaste has been proven effective in the prevention of dental caries (ARCPOH 2006). However, it is not designed to be ingested. Since many young children sometimes eat or inadvertently swallow toothpaste, it is important for parents to supervise and assist their children when using fluoridated toothpaste, and to encourage their children to spit the toothpaste out.



## 5.8 Dental fluorosis

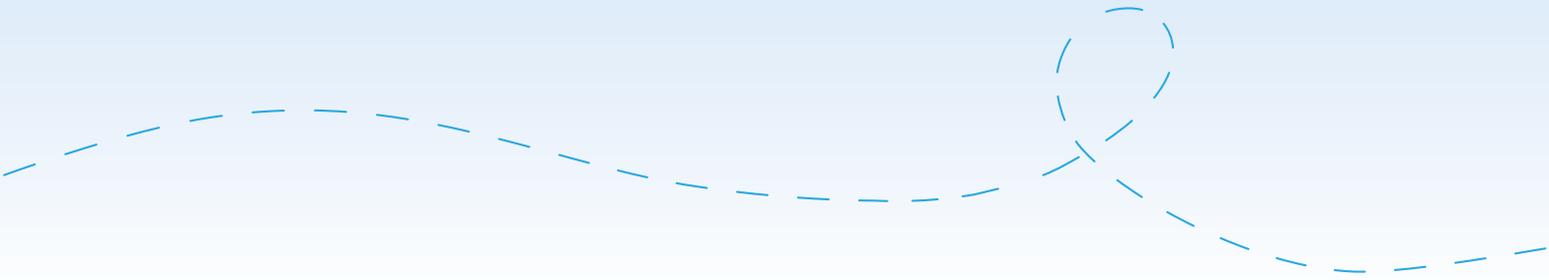
Dental fluorosis is defective formation of tooth enamel or dentine resulting from excessive fluoride ingestion during the period of tooth development, usually from birth until approximately six to eight years of age. In its mildest (and most common) form it may manifest as barely noticeable whitish striations, while more severe forms involve confluent pitting and staining of the dental enamel. Determining the exact level of fluorosis within a community is difficult as there are numerous other causes of enamel defects that may resemble fluorosis (DHS 2008).

Since the mid 1990s, the prevalence of dental fluorosis in Australia has markedly reduced, mainly attributable to the use of low-fluoride toothpastes in young children, and awareness raising of appropriate toothpaste use by children. In Australia, if dental fluorosis does occur, over 98 per cent of cases will be very mild or mild – and will be barely noticeable.

The risk of dental fluorosis occurring can be minimised by reducing exposure to fluoride in children with developing teeth, through measures such as:

- ❏ discouraging ingestion of toothpaste by children
- ❏ cleaning a child's teeth without toothpaste until the age of 18 months, unless otherwise recommended by an oral health professional
- ❏ using only a pea-sized amount of low-fluoride toothpaste, smeared over the toothbrush, between 18 months and until six years of age, unless otherwise recommended by an oral health professional
- ❏ spitting out and not swallowing toothpaste and not rinsing.

Dental professionals will determine suitability for additional fluoride therapies. Importantly, fluoride drops and tablets should not be used at all whether the drinking water is fluoridated or not.



## 5.9 Fluoride and infant formula

Historically, infant formula powder was manufactured with relatively high fluoride content, and when reconstituted with fluoridated water, there was potential for exposure to high levels of fluoride in relation to body weight (ARCPOH 2006). This is no longer a concern: 'Infant formula nowadays is safe for consumption by infants when reconstituted using fluoridated or non-fluoridated water' (ARCPOH 2006, p. 196). In order to limit the amount of fluoride in formula, infant formula manufacturers use non-fluoridated or de-fluoridated water in processing (NHMRC 2003). Recent Australian research demonstrates that regardless of the type of water used to reconstitute infant formula, no significant association exists between use of formula and dental fluorosis.

Food Standards Australia New Zealand (formerly ANZFA) is an independent statutory authority that develops food standards to protect the health and safety of the public. Standard 2.9.1 of the 2004 Australia New Zealand Food Standards Code relates to infant formula products. Clause 19 refers specifically to dental fluorosis. It states that infant formula containing more than 17 µg of fluoride per 100 kJ powder prior to reconstitution must include a warning about dental fluorosis on the label.

A study of the fluoride content of infant formulae in Australia, concluded that 'Prolonged consumption (beyond 12 months of age) of infant formula reconstituted with optimally fluoridated water may be a risk factor for the development of dental fluorosis of the anterior permanent teeth' (Silva & Reynolds, 1996). This is relevant for children requiring prolonged use of infant formula for medical reasons, but is not an issue for the vast majority of children weaned from infant formula by 12 months of age, in accordance with accepted guidelines.





## 6 Dental Disease and Trauma

### This section covers:

- 6.1 Dental caries
- 6.2 Early childhood caries
- 6.3 Gingivitis
- 6.4 Periodontitis
- 6.5 Trauma to teeth

To assist maternal and child health nurses to identify dental disease, photographs have been included. Referral to an oral health professional should occur immediately if any of the signs and symptoms of these conditions are identified.

### 6.1 Dental caries

Dental caries, commonly known as dental decay, is a diet-related transmissible infectious disease of the tooth structure whereby bacteria and bacterial by-products dissolve tooth structure.

#### **Prevalence**

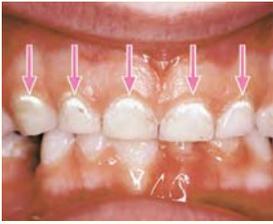
Dental caries is largely preventable, although many children still suffer unnecessarily from the pain and complications involved (Mount & Hume 2005).

- Data for children attending public dental clinics (2009–10) shows that 33 per cent of zero-to-five-year-old children experienced dental caries, and 69 per cent of those children were untreated (DHSV 2010a).
- The Child Dental Health Survey Australia 2003–04 (2009) shows that nearly half (48.9%) of six-year-old children had a history of dental caries in the deciduous teeth.
- The 10 per cent of four-to-six-year-old children with the most extensive history of deciduous dental caries had more than nine deciduous teeth affected, approximately four and a half times the national average, demonstrating that a minority of children carry a greater than average burden of disease (Armfield, Spencer & Brennan 2009).

## Signs and symptoms

A child may have dental caries if:

- There is a dull white band along the gum line (or white spot lesions) – this is the first sign and usually remains undetected by parents.
- There is a yellow, brown or black collar around the neck of the teeth – this indicates the progression to dental caries.
- Teeth that look like brownish-black stumps – this indicates that the child has advanced dental caries.
- A child has mouth pain or a toothache.



### 1. First stage

The upper incisors develop a dull white band along the gum line.



### 2. Early stages

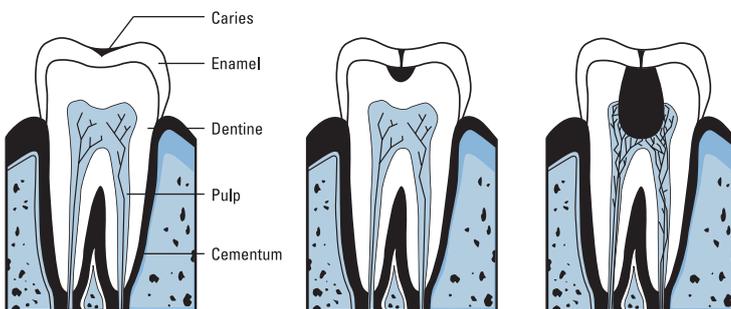
Some brown spots on teeth, redness and swelling of gums.

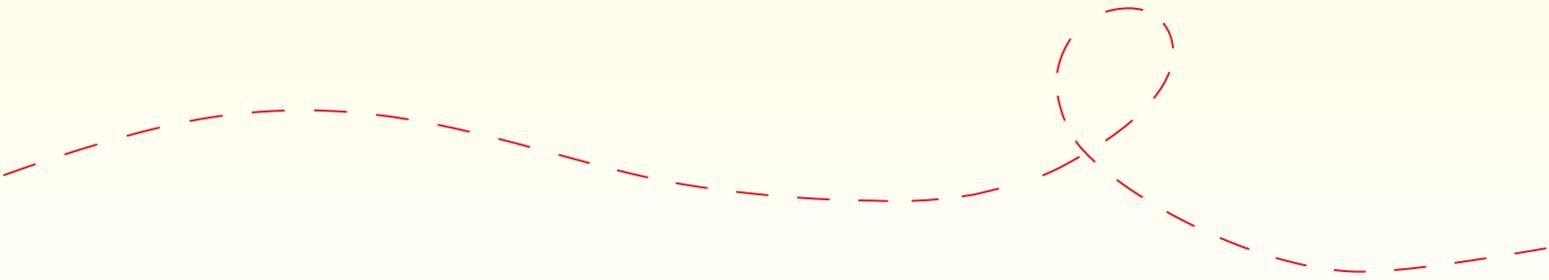


### 3. Advanced stages

Blackened areas and very red and inflamed gums.

## Process of caries invading the cross section of a molar





## **Causes**

Dental caries is a common and chronic disease. The following are the most influential factors in the formation of dental caries (Mount & Hume 2005):

- ❖ accumulation and retention of plaque
- ❖ frequency of exposure to fermentable carbohydrates
- ❖ frequency of exposure to dietary acids
- ❖ presence of natural protective factors such as saliva
- ❖ exposure to fluoride.

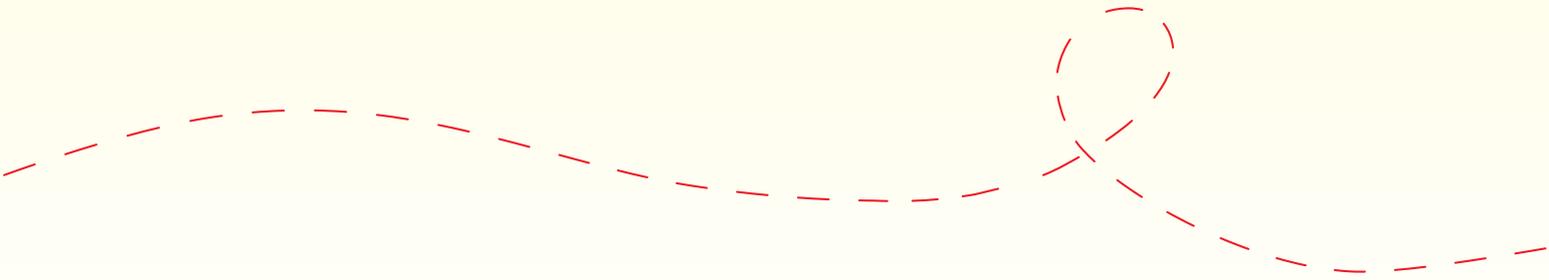
## ***Bacterial dental plaque***

Immediately after cleaning teeth, a thin organic layer called the acquired pellicle rapidly forms on the teeth. It has a protective function, and while it does not initially contain micro-organisms, it is soon colonised by the normal bacteria flora. Once bacteria are established, this is called bacterial dental plaque.

Over time, bacterial plaque becomes more virulent, with an increase of mutans streptococci and anaerobic bacteria. Bacterial dental plaque continues to form by bacterial reproduction and by breaking down sucrose and starches into polysaccharides, glucans and fructans. These are sticky, gelatinous substances that increase the plaque's ability to adhere to the tooth's surface and each other. They also reduce the buffering action of saliva. A by-product of this process is the production of acid, which cause a loss of mineral ions (demineralisation) from the tooth.

In a healthy mouth, this demineralisation process is short lived and balanced by remineralisation of the tooth. The chemical process of remineralisation occurs when the structure of the tooth is rebuilt by minerals (calcium or phosphate ions) found in saliva, and can be enhanced by the presence of fluoride. The remineralisation process is often initiated by the mineral rich saliva and assisted by plaque control. Plaque levels can be reduced and controlled by frequent tooth brushing.

Caries forms and progresses when the balance between demineralisation and remineralisation is upset, and favours demineralisation. In the early stages, demineralisation leads to formation of a white spot lesion – a non-cavitated reversible lesion. As caries progresses the enamel surface breaks down and cavitation occurs. Once cavitation occurs, the lesion is not reversible.



## *Diet*

### *Fermentable carbohydrates*

Fermentable carbohydrates are substrates for bacterial activity – they feed the bacteria. They are generally simple sugars and starches such as:

- ❖ glucose
- ❖ sucrose
- ❖ fructose
- ❖ maltose
- ❖ lactose.

Simple sugars such as sucrose, fructose and glucose are converted into acids like lactic acid, by microorganisms, through a glycolytic process called fermentation. These acids then cause demineralisation of the tooth. When considering the relationship of the diet and dental caries, the following factors need to be considered:

- ❖ The frequency of eating and drinking – the more frequently one eats or drinks, the greater potential there is for acid production in the mouth, leading to caries. This is the factor that has the greatest potential for damaging teeth.
- ❖ The consistency of foods eaten – some foods are cleared more rapidly from the mouth than others. Foods that stay around the mouth longer have more caries causing potential.

### *Acidic foods and drinks*

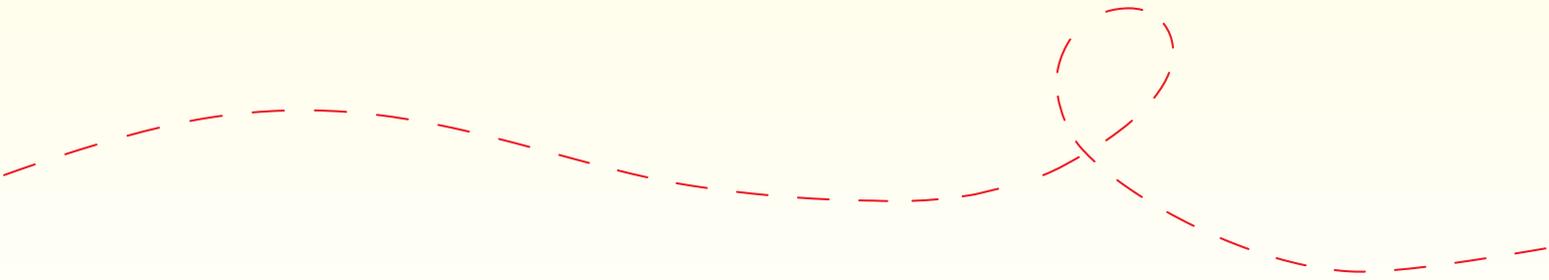
Acidic foods and drinks cause the oral environment to become acidic. When acidic foods (such as pickles, salad dressing, oranges, lemons, soft drinks, cordials, syrups and fruit juices) are consumed frequently, they can increase the demineralisation of the teeth, which is known as erosion.

## *Time*

The time it takes for teeth to form caries varies, and is influenced by the risk factors mentioned above and by factors such as:

- ❖ position and closeness of the teeth in the mouth
- ❖ ease of cleaning of the teeth
- ❖ the length of time the teeth have been in the mouth.

As new deciduous teeth have not had very long to be strengthened by the topical effect of fluoride in the mouth, they can become carious very rapidly if frequently exposed to sugar.



## ***Saliva***

Saliva protects the teeth from caries and performs a number of important functions, including:

- ❖ acting as a buffer to neutralise acids
- ❖ providing minerals necessary for the remineralisation of tooth enamel
- ❖ lubricating the mouth to assist food movement and speech
- ❖ assisting formation of the pellicle, a protective barrier formed on the enamel by salivary proteins.

Food and bacterial activity can decrease the pH in the mouth, and this acidic environment can lead to demineralisation. A steady flow of saliva assists the pH to return to normal in a relatively short time, provided oral hygiene is maintained. Diseases and drugs that reduce the flow of saliva also increase the risk of dental caries. It is important to note that saliva flow decreases during sleep, therefore the risk of dental caries is greater at night.

## ***Fluoride***

Fluoride acts as a constant repair kit for teeth after it is redistributed into saliva. Following acid attack and the demineralisation process, the fluoride in saliva interacts with these minerals and salts at the tooth surface to remineralise the damaged enamel. A constant supply of a low level of fluoride within the saliva is beneficial for replacement of lost minerals and therefore reduction of dental caries.

## ***Age***

Dental caries can be found in people of all ages who have natural teeth.

## ***Prevention***

The prevention of dental caries requires a holistic approach to the multitude of biological and social factors involved in the causation of the disease. These factors include:

- ❖ therapeutic levels of fluoride in the environment
- ❖ early detection and management of the disease
- ❖ preventive measures including tooth brushing, remineralisation of demineralised enamel
- ❖ reduced exposure of an individual to fermentable carbohydrates and sugars.

## ***Treatment***

Referral to an oral health professional is required. Because it is a slow process that is reversible in the early stages, assessment for dental caries should be undertaken regularly by an oral health professional. The taking of radiographs may be necessary to assist with diagnosis of dental caries. Treatment may involve measures such as oral hygiene advice or topical fluoride application. If caries is more advanced, treatment may include local anaesthesia, restorations (fillings) or possibly extractions.

## 6.2 Early childhood caries

Early childhood caries is a particularly severe form of dental caries affecting the deciduous teeth of infants and young children (Berkowitz 2003). A number of terms have been given to this condition, including nursing caries, infant feeding caries, baby bottle caries and nursing bottle syndrome.

### **Prevalence**

The reported prevalence ranges from 2.5 to 15 per cent (Cameron & Widmer 2003), but the prevalence and severity of early childhood caries in low socio economic, immigrant and indigenous communities is higher (Hallett & O'Rourke 2002).

The upper incisors will be the most severely affected because of their early eruption. The lower incisors, protected by the tongue and washed by saliva from the mandibular salivary glands, usually remain unaffected.

### **Signs and symptoms**

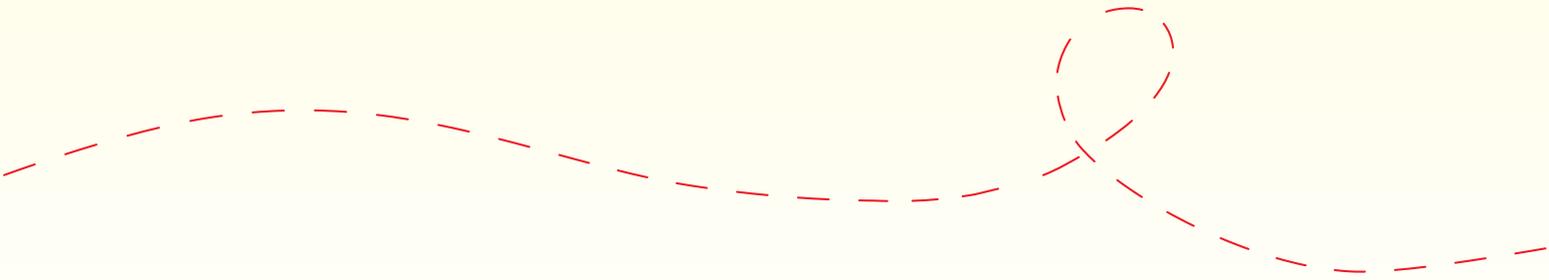
- Initially, the upper incisors develop a dull white band along the gum line (or white spot lesions) — this is the first sign and usually remains undetected by parents.
- As the condition progresses, these white areas develop into cavities around the neck of the teeth in a yellow, brown or black collar — this indicates the progression to caries.
- In advanced cases, the crowns of the four upper incisors may be destroyed completely, leaving brownish-black root stumps. The four lower incisors usually remain relatively unaffected.
- A child has mouth pain or a toothache.

Refer to Dental caries (6.1) - signs and symptoms for photographs of caries.

### **Causes**

The newly erupted teeth are particularly at risk of dental caries because maturation of the enamel with minerals is yet to occur. Development of early childhood caries is an infective process initiated by the transmission of oral bacteria (mutans streptococci) from mother to infant. This transmission of oral bacteria from mother to infant by way of saliva could be caused by:

- the mother using her eating utensils to feed the infant
- the mother tasting the food or testing the temperature in her mouth prior to feeding
- 'washing' a dummy in the mother's mouth and then giving it to the infant
- the infant placing their fingers into the mother's mouth and then into their own.



Once the transmission of bacteria has occurred between mother and infant, these bacteria can then become established and multiply if the infant has a high sugar diet, or if the bottle (containing fluids other than water) is used as a pacifier.

If liquid is consumed frequently and for prolonged periods during the day or night, the liquid will pool around the teeth. If the liquid contains simple sugars, they will be converted by the bacteria into acids that demineralise the enamel of the teeth. In this stagnant acid environment, early childhood caries can develop quickly.

During early feeding the natural or artificial nipple rests against the infant's palate while the tongue is extended over the lower incisors. Liquid from the nursing bottle or a mother's breast will bathe all of the teeth except the lower incisors, which are protected by the tongue.

### **Age**

Early childhood caries can occur as soon as the first tooth erupts, usually between six and 12 months. Parents usually first notice cavities when the child is about 20 months of age.

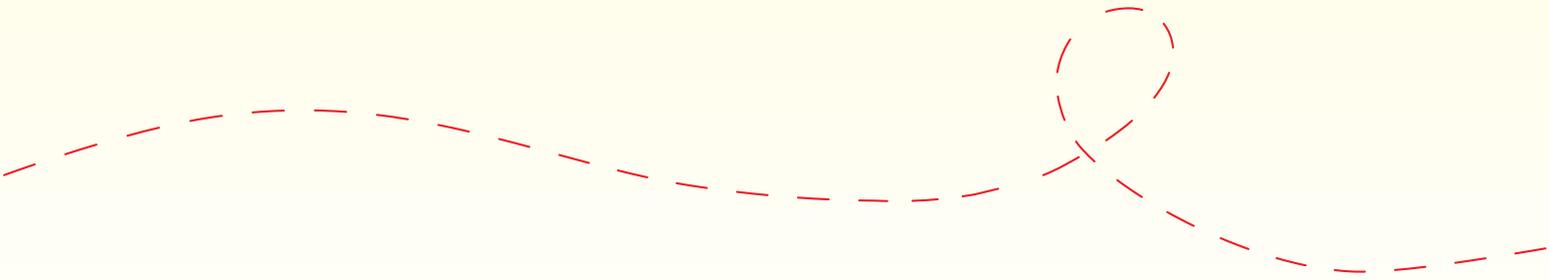
### **Prevention**

The prevention of early childhood caries also requires a holistic approach to the multitude of biological and social factors involved in the causation of the disease. These factors include:

- ❖ the importance of maternal oral health
- ❖ early detection and management of the disease
- ❖ the appropriate use of the feeding bottle
- ❖ the appropriate use of a dummy or pacifier
- ❖ limitation of sugary foods and drinks
- ❖ use of sugar-free medications (where appropriate)
- ❖ tooth brushing and cleaning
- ❖ regular dental visits.

### **Early detection of early childhood caries**

Early detection is necessary in order to prevent this condition in children. Maternal and child health nurses play a crucial role in the early detection of early childhood caries and in the education of parents and carers. Maternal and child health nurses are to complete comprehensive mouth checks (lift the lip, look and locate) at identified key age and stage consultations. For more information see Section Three — Mouth Checks.



### ***A mother's oral health and early childhood caries***

It is important for mothers to look after their own oral health during and after pregnancy. Studies have found an association between a mother's oral health status and that of her child. A mother's Mutans Streptococci bacterial count, active decay and sugar consumption are strong risk indicators for children's caries (Smith et al 2002; Thorild, Lindau Jonson & Twetman 2002). For more information, see Section Four — Promoting Individual Oral Health Practices.

### ***Feeding and early childhood caries***

Exclusive breast feeding is recommended up to six months of age. Infant formula is the only alternative if a mother is partially or no longer breastfeeding. It is recommended that mothers then continue breastfeeding until the infant is 12 months of age, and further continued if both mother and infant wish (NHMRC 2003).

Exclusive breast feeding may reduce the risk of development of tooth decay due to decreased and delayed consumption of sugary meals and snacks (Feldens et al 2010; Feldens et al 2007). Further, laboratory studies indicate that human breast milk does not appear to result in the drop of plaque pH that is required for the initiation and progress of dental caries, and may actually promote the deposition of calcium and phosphates ions on the tooth surface (Gussy et al 2006).

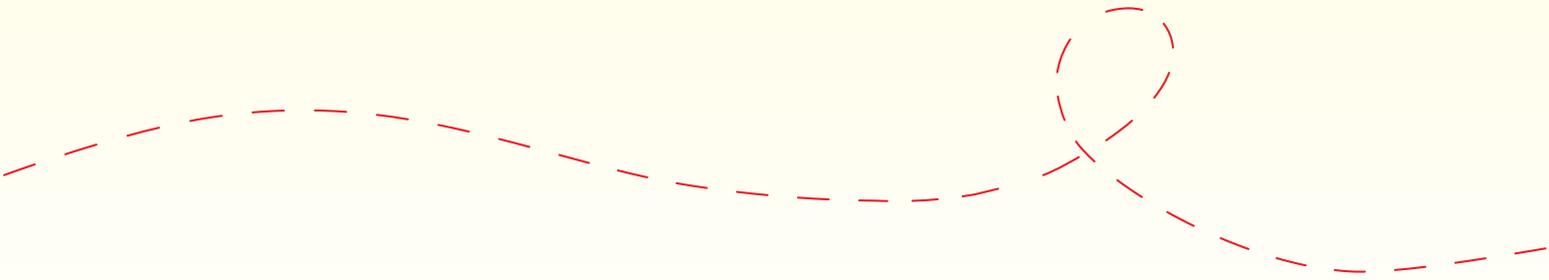
However, whether breast fed or bottle fed, infants can be at risk of developing caries. It is important to encourage the maintenance of oral health and hygiene from when teeth erupt. There is some concern that on-demand prolonged breast feeding during the night may increase the risk of early childhood caries in susceptible children, however the evidence is not strong (Valaitis 2000; Richards, 2008; Lida et al 2007). In reference to oral health and hygiene in breast fed infants, The Australasian Academy of Paediatric Dentistry Standards of Care states:

*The risk of early childhood caries also exists for susceptible children who are breastfed. Susceptibility relates to the nature of the nursing fluid, the frequency and duration of the nursing pattern and the absence of appropriate oral hygiene measures. The aetiology related to frequent and extended nursing times results in exposure of susceptible tooth surfaces to metabolic by products of cariogenic bacteria (Australasian Academy of Paediatric Dentistry, 2003).*

The Academy recognises that early childhood caries in breastfed infants is a complex issue and 'does not suggest the risk of dental disease contraindicates breastfeeding of susceptible children' (Australasian Academy of Paediatric Dentistry, 2003).

When bottle-feeding with infant formula or expressed breast milk, appropriate use of a bottle should be encouraged. Recommendations include:

- ❖ Babies should be fed by an adult. When feeding is complete, the bottle should be taken away.
- ❖ The bottle should only contain breast milk and appropriate infant formula.
- ❖ Do not dip pacifiers or bottle teats in sugar or honey.
- ❖ A cup should be introduced from six months. A bottle is not necessary after the age of 12 months.



### ***Dummies and early childhood caries***

Parents and carers should not dip the dummy in any foods or liquids. Coating the dummy in substances such as honey may lead to extensive dental caries.

### ***Medicines and early childhood caries***

Many medicines may contain a large amount of sugar and are often given before the child goes to sleep. This can become a problem for teeth if the child suffers from a chronic illness and is continually taking medicines.

Infants and children are often prescribed liquid medications because they are easier to administer. Parents and carers should be advised of methods for maintaining oral health when using risk of medicines containing sugars. If available a sugar-free form of medicine will avoid risk of caries. If not, parents should ensure their child rinses their mouth with water after taking medication to minimize risk. Medicines in capsule or tablet form do not cause dental caries.

A number of liquid medications contain sugar or contain high sugar content. These can include:

- ❖ antibiotic mixtures
- ❖ anticonvulsant syrups
- ❖ antihistamine syrups
- ❖ paracetamol syrups
- ❖ asthma mixtures
- ❖ cough and cold medicines
- ❖ cardiac medications.

### ***Treatment***

Referral to an oral health professional is required. In the early stages early childhood caries is reversible. The best treatment is to modify behaviour. In severe cases, the treatment may be difficult, costly and distressing to both parents and children. Treatment in severe cases may require general anaesthesia.

## 6.3 Gingivitis

Gingivitis is the early stages of gum disease. Gingivitis describes plaque-induced inflammation of the gingival tissues (gums). Gum disease, including gingivitis and periodontitis, describes a range of conditions that affect the supporting tissues for the teeth.



*Inflamed gingival tissues (gums)*

*Gingivitis in a ten year old*

### **Prevalence**

Gingivitis is relatively common in children. It occurs in about half the population by four or five years of age, and increases with age.

### **Signs and symptoms**

Inflamed red gums, bleeding on touching or when soft brushing occurs, oedema (swollen gums).

### **Causes**

Gingivitis is caused by the accumulation of plaque on the teeth and in the crevice between the gums and the teeth. Important contributors are crowded teeth and mouth breathing, which dries the gingiva.

### **Age**

Occurs in half the population by four or five years and peaks at puberty.

### **Duration**

Totally reversible in children by improving oral hygiene.

### **Prevention**

Good oral hygiene practices.

### **Treatment**

Referral to an oral health professional is required. Encourage good oral hygiene practices such as tooth brushing with a small, soft toothbrush.

## 6.4 Periodontitis

Periodontitis is the progression of gum disease to affect the deeper supporting tissues, including the bone, root surface and the ligament that connects the teeth to the bone.



*An adult mouth showing periodontal disease*

### **Prevalence**

Rarely affects children.

### **Signs and symptoms**

Loose teeth, migrated teeth to near positions and in rare cases spontaneous exfoliation of deciduous teeth with root resorption.

### **Causes**

Periodontitis is caused by certain bacteria in plaque that accumulate on the gum line of teeth. These bacteria produce toxins that seep down between the gum and the tooth, irritating the gum tissues and causing them to become reddened, inflamed and to bleed. Periodontitis may also be a manifestation of a serious underlying immunological or genetic disorder.

### **Age and duration**

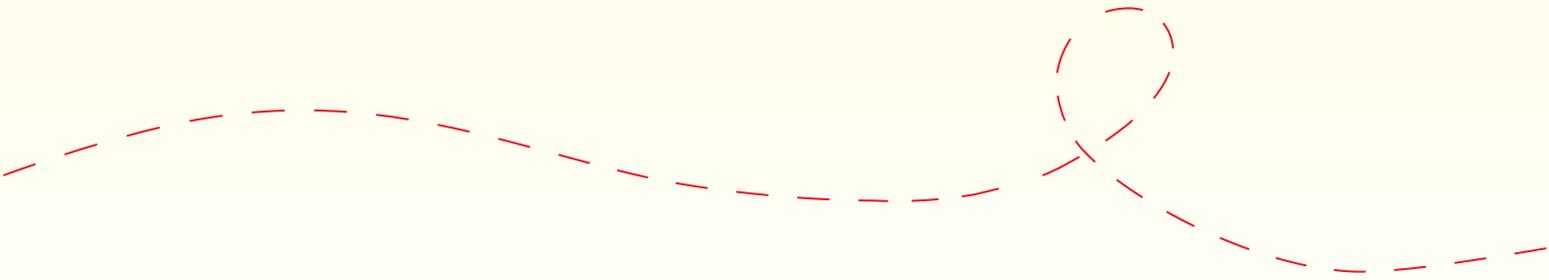
Periodontitis is a chronic disease that rarely affects pre-pubertal patients. The number and severity of affected sites increases steadily with age, demonstrating that adult periodontitis can often begin in adolescent years.

### **Prevention**

Like dental caries, it can be preventable unless there is a strong genetic or medical component. Periodontitis responds well to improved oral hygiene techniques such as plaque removal, especially in the earlier stages. In adults it is more common and severe.

### **Treatment**

Referral to an oral health professional is required. If the plaque is not cleaned away, the toxins may gradually destroy the fibres and the bone which hold teeth in place. This eventually leads to the loosening of teeth, whose removal may be necessary. Antibiotic prophylaxis has also been shown to be helpful in conjunction with oral hygiene techniques.



## 6.5 Trauma to the teeth

### ***Deciduous teeth***

Trauma to a deciduous tooth can lead to fracture of the tooth itself, or even the tooth root or the supporting bone. It can also lead to displacement of the knocked tooth into the bone, or the tooth could be knocked out.

Because the roots of deciduous teeth are often close to the underlying permanent tooth, it is advisable that any trauma be referred to an oral health professional as soon as possible.

If a deciduous tooth is knocked out, do not place it back in the socket. Deciduous teeth which have been replaced tend to fuse themselves to the bone of the socket. Also, the permanent tooth underneath can be damaged when the deciduous tooth is replaced. Seek dental advice as soon as possible, taking any tooth fragments with you to the oral health professional.

### ***Permanent teeth***

It is advisable that any trauma be referred to an oral health professional as soon as possible. If a permanent tooth is knocked out and is promptly replaced in the socket it has a good chance of survival. Every minute the tooth is out of the socket decreases the chance of the tooth surviving. The treatment for a permanent tooth that has been knocked out is:

1. Find the tooth.
2. Handle the tooth by the crown only, avoid handling the root.
3. If root has debris on it, gently rinse the tooth in saline solution, milk or the patient's own saliva for a few seconds only.
4. Do not attempt to clean the tooth by scrubbing or using cleaning agents.
5. Do not let the tooth become dry.
6. Replace the tooth immediately if the patient is conscious. Make sure it is put back facing the right way round. Hold the tooth in place with some aluminium foil or by gently biting on a handkerchief.
7. Contact an oral health professional immediately.
8. Consideration should be given to a tetanus injection.

If you cannot replace a permanent tooth in its socket:

1. Store the tooth in milk, saline solution or the patient's own saliva, or wrap the tooth in plastic cling wrap.
2. Avoid handling the root.
3. Seek dental help immediately as it is important that the tooth be replaced as quickly as possible.



## 7. Oral Medicine

### This section covers:

- 7.1 Natal and neonatal teeth
- 7.2 Gingival cysts
- 7.3 Eruption cyst
- 7.4 Abscess (periapical abscess)
- 7.5 Cellulitis
- 7.6 Geographic tongue
- 7.7 Mucocele
- 7.8 Ulcers
- 7.9 Oral candidiasis (thrush)
- 7.10 Primary oral herpes simplex infection
- 7.11 Recurrent herpes simplex and herpes labialis
- 7.12 Hand, foot and mouth disease
- 7.13 Measles
- 7.14 Tongue tie
- 7.15 Cleft lip and palate
- 7.16 Asthma
- 7.17 Diabetes

This section is intended to broaden maternal and child health nurses' knowledge and recognition of oral conditions. The information covered in this section is to be used in conjunction with existing resources. Maternal and child health nurses will use their own professional judgement about appropriate referral to a medical or oral health professional. This section describes the generally accepted practice at the time of publication. It is a guide only and as such is a general summary of the clinical knowledge. Maternal and child health nurses should regularly update their knowledge of the area and exercise their clinical judgment when applying this information.

## 7.1 Natal and neonatal teeth

A natal tooth is one that is present at birth. A neonatal tooth is one that erupts within 30 days of birth. Generally, the distinction between natal and neonatal teeth is artificial, and it is more appropriate to call them all natal teeth.



*Natal tooth*



*Neonatal tooth*

### **Prevalence**

Around one in 2000–3000 births feature a natal tooth (Adekoya-Sofowora 2008). Eighty-five per cent of natal teeth are mandibular (lower) incisors (Leung & Robson 2006).

### **Signs and symptoms**

Teeth are present at birth, or erupting within 30 days of birth. In most cases, natal teeth are the normal primary incisor teeth erupting early. Prematurely erupted teeth are often mistakenly called natal teeth.

### **Causes**

Epithelial remnants trapped along lines of fusion of embryological processes.

### **Age**

Newborns aged 0–30 days.

### **Duration**

As the natal tooth is often a prematurely erupted baby tooth, it is acceptable to leave it alone, unless the tooth is mobile, in which case the risk of inhaling the tooth dictates its extraction.

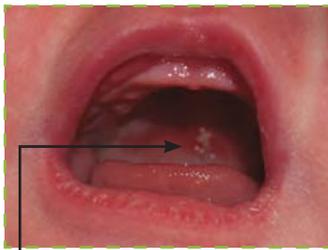
### **Treatment**

Treatment depends on the effect these teeth may be having on either the child or the mother. If the natal teeth are not too mobile they can be retained as they may firm with time. If very loose, they may fall out (exfoliate), and there is a risk of them being swallowed or inhaled. In this case, they should be removed by an oral health professional. This will have no effect on the underlying permanent teeth. In some cases, natal teeth can cause damage to the baby's opposing gums or can cause pain to the mother during breastfeeding. In both cases extraction may be warranted and advice should be sought from an oral health professional.

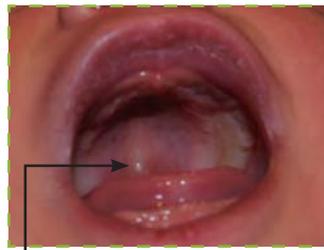
## 7.2 Gingival cysts

Gingival cysts are hard, raised nodules, and are classified as follows:

**Epstein's pearls** — are small, white, pearl-like spots that appear in the middle of the hard palate (on the roof of the mouth). These bumps are harmless and tend to disappear within a few weeks.

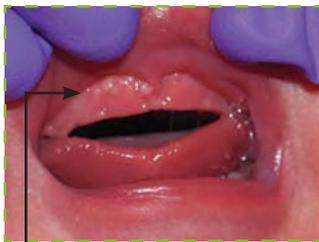


• A cluster of Epstein pearls



• An Epstein pearl

**Bohn's nodules** — are remnants of the dentinal lamina and occur on the labial (cheek side) of the maxillary alveolar ridges (gum ridge). These small, whitish bumps or cysts look like Epstein's pearls, but can be differentiated by their site of presentation.



• Bohn's nodules

*Photos courtesy of Associate Professor Janelle Aby*

### **Prevalence**

Gingival (keratin) cysts are relatively common in newborns. Epstein's pearls occur in 60–85 per cent of newborns (Eichenfield & Larralde 2004). Bohn's nodules occur in up to 85 per cent of newborns (Eichenfield & Larralde 2004).

### **Signs and symptoms**

Hard, raised nodules, classified as above.

### **Causes**

Epithelial remnants trapped along lines of fusion of embryological processes.

### **Age**

Usually occur in newborns. They are present in all children, but are normally shed in utero.

### **Duration**

Nodules usually slough off in the first three months.

### **Treatment**

No treatment is required other than the reassurance of parents.

### 7.3 Eruption cysts

An eruption cyst occurs above an erupting tooth (deciduous and permanent teeth).



*Eruption cyst*

#### **Prevalence**

Relatively common (Koch, Kreiborg & Andreasen 2009).

#### **Signs and symptoms**

An eruption cyst appears as a smooth, localised, dome shaped, fluid filled swelling. It is bluish in colour if it contains blood, is painless and overlies an erupting tooth.

#### **Causes**

The cyst is caused by abnormal follicular enlargement just before eruption. Trauma leads to bleeding within the follicle, producing the purplish brown appearance.

#### **Age**

Children aged between six months and 12 years.

#### **Duration**

The cyst drains once the tooth erupts; this length of time varies from individual to individual.

#### **Treatment**

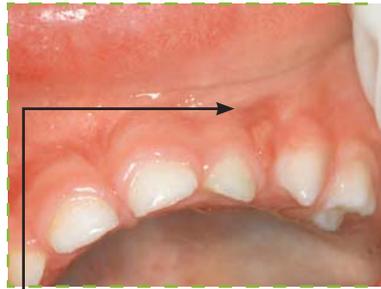
Usually no treatment is necessary unless the cyst becomes infected. In this case, a referral to an oral health professional is required.

## 7.4 Dental abscess (periapical abscess)

A periapical abscess is caused by the spread of infection from the dental pulp (tooth nerve) to the periapical area — the area around the tooth root apex. The abscess may track through to the gingival mucosa where it forms a draining sinus.



• Abscess



• Abscess

### **Prevalence**

A periapical abscess is the most common tooth-related abscess in children (Harris 2008).

### **Signs and symptoms**

There may be a dull throbbing pain associated with the abscess. This pain may be worse while eating or at night. Pus may be visible. A draining sinus associated with an abscess generally appears as a pimple on the gum around the affected tooth.

### **Causes**

A dental abscess is caused by an infection around the root of a tooth. The source of the infection is usually dental caries that has spread to the pulp and then to the periapical area.

### **Age**

All ages of people with teeth.

### **Duration**

A dental abscess will last until definitive treatment is performed. If asymptomatic (shows no noticeable symptoms), an oral health professional may decide to delay treatment.

### **Treatment**

The child should be referred to an oral health professional so the tooth can be treated. Treatment depends on which tooth is involved and the extent of the abscess. It may require extraction or root canal treatment. A long-standing abscess on a deciduous tooth can affect the development of the permanent tooth.

## 7.5 Cellulitis

Cellulitis is an acute spreading infection and inflammation of the dermis and connective tissues deep to the dermis, resulting in pain, redness, swelling and warmth.



*Cellulitis*

### **Prevalence**

Facial cellulitis is more common in children under the age of three (Micali & Dhawan 2010), but can also occur in adults following spreading infection from a grossly carious tooth.

### **Signs and symptoms**

The infection commonly occurs in the facial planes of the lower jaw and is associated with swelling, redness, and inflammation. The patient may display systemic signs of fever.

### **Causes**

Cellulitis is caused by bacteria, usually *Staphylococcus aureus* (also called Staph) and Group A beta haemolytic streptococcus. Cellulitis has the same causes as an abscess, but the organisms will have the ability to spread. This is an extension of infection through soft tissues, and can occur if the resistance of the child is low or the virulence of the infecting organism very high.

Dental caries can cause infection of the periapical area (the area around the root of the tooth). If this infection spreads to the surrounding connective tissues and causes gross inflammation, exudate and oedema, together with toxæmia and fever, facial cellulitis may occur. Cellulitis around the head and neck should always be treated immediately as the sequelae are potentially life threatening. Referral to an oral health or medical professional is mandatory. In some cases, cellulitis can spread to the floor of the mouth and down to the pharynx and larynx. This is an extremely serious condition known as Ludwig's angina, which can cause obstruction of the patient's airway.

### **Age**

All age groups.

### **Duration**

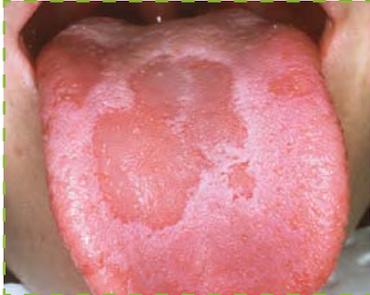
Cellulitis is not self limiting, and will last until appropriate treatment is provided.

### **Treatment**

Cellulitis should always be treated with urgency. Management of severe cases may require hospitalisation, antibiotics, fluid replacement and removal of the cause, for example, extraction or endodontic (root canal) treatment of the tooth.

## 7.6 Geographic tongue

Also known as benign migratory glossitis or wandering rash of tongue.



*Geographic tongue*

### **Prevalence**

Occurs in up to 3 per cent of the general population (Kelsch 2010).

### **Signs and symptoms**

The condition is usually asymptomatic, but it may be associated with sensitivity to acidic foods. Geographic tongue makes the tongue appear patchy. It is characterised by single or multiple areas of pink to red smooth patches where the taste buds appear to be absent, with raised white borders. The areas continually change position and migrate from site to site. Geographic tongue is benign.

### **Causes**

Unknown, but emotional stress, nutritional deficiencies and hereditary factors have been suggested.

### **Age**

It may occur at any age, but it is more predominant in adults than in children (Kelsch 2010).

### **Duration**

May appear suddenly and persist for months or years. It often recurs.

### **Treatment**

It is a benign condition and generally does not require any treatment.

## 7.7 Mucocele

A mucocele is a cyst-like swelling caused by saliva build-up within subcutaneous tissue following damage to salivary ducts.



*Mucocele*

### **Prevalence**

2.4 cases per 1,000 people (Flaitz, & Hicks 2009; López-Jornet 2006). The mucocele constitutes the most common nodular swelling of the lower lip.

### **Signs and symptoms**

These swellings are asymptomatic, soft, fluctuant, bluish grey (although long standing lesions may have a whitish appearance) and are usually less than one centimetre in diameter. Saliva builds up in connective tissue, which is surrounded in a fibrous capsule. The most common location is the lower lip.

### **Causes**

Arises from trauma to one of the minor salivary glands in the lips or cheeks. Often caused by lower-lip biting or other minor injuries.

### **Age**

Seventy per cent of mucoceles occur in individuals younger than 20 years (Flaitz, & Hicks 2009).

### **Duration**

Superficial lesions usually burst and heal within three to six weeks. Persistent lesions require treatment for resolution.

### **Treatment**

Superficial mucoceles usually burst and heal spontaneously. Persistent mucoceles are treated by surgical excision.

The development of a bluish swelling after trauma is suggestive of a mucocele; investigation by an oral health professional is suggested to exclude other lesions.

## 7.8 Ulcers

Ulcers can be classified as aphthous, traumatic, herpetic or malignancy.

### ***Aphthous ulcer***



*Aphthous ulcer*

### ***Prevalence***

Approximately 20 per cent of the general population is affected by Aphthous ulcers (Vucicevic Boras & Savage 2007). They usually first appear in childhood or adolescence (Scully 2006).

### ***Signs and symptoms***

Aphthous ulcers are characterised by painful, recurrent solitary or multiple lesions or ulcerations. They are usually less than five millimetres in diameter. Aphthous ulcers can occur in any site in the mouth, especially on the cheeks, lips and tongue.

### ***Causes***

The exact cause is not known, but aphthous ulcers are often triggered by minor trauma, stress and nutritional deficiencies.

### ***Age***

They usually first appear in childhood or adolescence, but can occur in people of all ages.

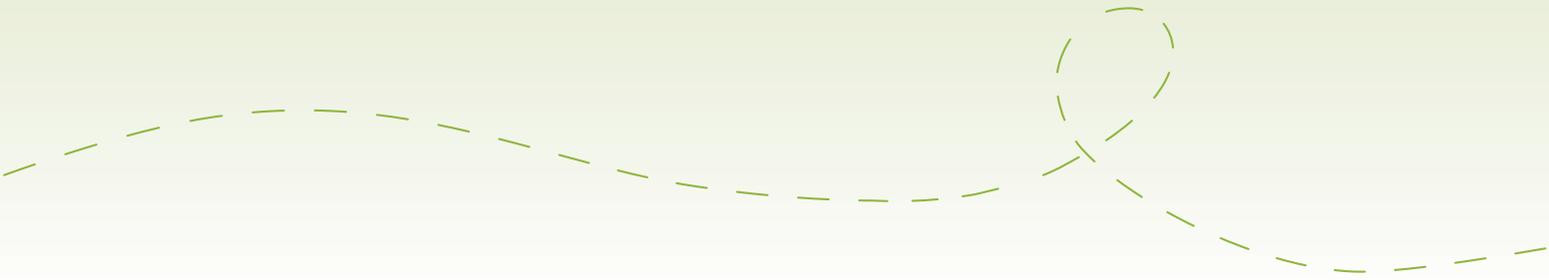
### ***Duration***

Usually heal spontaneously in one to two weeks.

### ***Treatment***

Treatment for aphthous ulcers is limited and confined to restricting the intake of food that irritates ulcers such as citrus foodstuffs like orange juice, and salty items like Vegemite. A suitable topical anaesthetic may be applied to the affected site for temporary relief, particularly before eating.

Any ulcer that does not heal within two weeks should be investigated by a medical or an oral health professional.



### ***Traumatic ulcer***

A traumatic ulcer may be the result of:

- ▣ mechanical trauma caused by a sharp object (such as a pencil)
- ▣ cheek biting
- ▣ thermal trauma (such as eating overheated foods or drinks)
- ▣ chemical trauma (such as holding aspirin against the oral mucosa).

These ulcers usually heal within a week to 10 days.

### ***Herpetic ulcer (infectious ulcers)***

If multiple lesions resembling aphthous ulcers occur accompanied by a fever, an infection with the herpes simplex virus must be considered. This is often seen in babies and young children (see Section 7.10, primary oral herpes simplex infection).

### ***Malignancy ulcer***

The most significant of these is caused by leukaemia. These ulcers appear as swelling and ulceration of the gingivae with spontaneous bleeding. Squamous cell carcinoma may present as a discrete ulcer with a characteristic rolled edge, but would be very rare in a child.

## 7.9 Oral candidiasis (thrush)

Oral candidiasis (thrush) is an overgrowth of oral candida albicans. Candida albicans is a yeast-like fungus that is present in many foods and is part of the healthy bacterial flora that live in the mouths of around half the Australian population.



*Thrush*

### **Prevalence**

Oral candidiasis is the most common human fungal infection, especially early in life (Akpan & Morgan 2002). It is often seen in babies and infants, or in individuals on long term antibiotics or immuno suppressive drugs (Akpan & Morgan 2002).

### **Signs and symptoms**

The yeast affects the superficial layers of the mouth tissues. Thrush is generally a local surface infection that produces milky white patches in the mouth that can be easily wiped off the oral mucosa. Oral infection may be associated with infection in the nappy area. Very rarely, fever and gastrointestinal irritation may accompany the disorder, and this signifies a more general infection.

### **Causes**

Overgrowth of candida albicans. Candidiasis can be caused by inhaled cortico-steroids used to treat asthma. Parents should rinse children's mouth with water after inhalation to reduce the likelihood of infection.

### **Age**

Candidiasis commonly occurs in young babies and infants.

### **Duration**

Infection can persist for days or weeks.

### **Treatment**

Referral to an oral health professional is required. Treatment consists of topical anti fungal agents applied directly to the affected areas.

## 7.10 Primary oral herpes simplex infection

The primary form or initial contact of the herpes simplex viruses (types one and two) within the oral cavity may be mild and unnoticed. Some cases can result in extensive oral ulceration involving most of the oral surfaces.



*Oral herpes simplex infection*

### **Prevalence**

The herpes simplex infection is very common. Around 90 per cent of adults have herpes simplex antibodies in their bloodstream, which means that they have been infected with the virus at some time (Better Health Channel 2008a). People are usually infected in childhood or young adulthood.

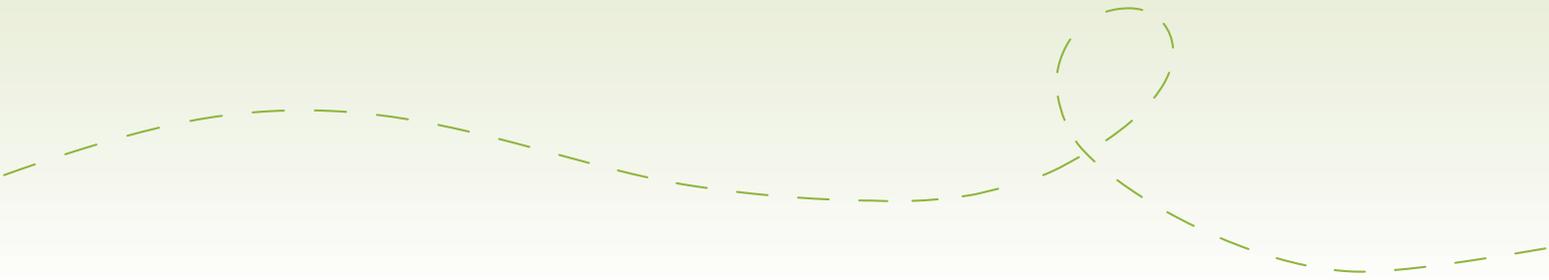
### **Signs and symptoms**

Localised inflammation and blistering on the skin. Intra-oral infection may cause vesicles to form, which then burst to cause painful ulceration of the oral mucosa. Infection may be associated with:

- intensely red gums
- gingivitis
- swollen lymph glands
- fever
- restlessness
- bad breath
- dribbling
- dehydration.

### **Causes**

The herpes simplex virus is usually transmitted to the child by a parent, relative or friend who has active cold sores when kissing the child.



### **Age**

This primary form of infection usually occurs before the child is five years of age.

### **Duration**

Herpes usually heals within 12 to 20 days.

### **Treatment**

- ✦ maintain a nutritious and substantial diet
- ✦ maintain fluid intake
- ✦ offer bland foods such as yoghurt and custard
- ✦ avoid salty, spicy or acidic foods (which irritate the mouth).

## 7.11 Recurrent herpes simplex and herpes labialis

Herpes labialis (cold sores) are small blisters that usually form on the lips or skin around the mouth, nose and on the chin. There are two types of herpes simplex infection: herpes simplex virus type 1 (HSV-1) and herpes simplex virus type 2 (HSV-2) (Better Health Channel 2010). Cold sores around the mouth are generally caused by HSV-1 and are a reoccurrence of the earlier infection.



*Adult mouth showing secondary herpes infection (cold sores)*

### **Prevalence**

One third of infected people experience cold sores (Better Health Channel 2010).

### **Signs and symptoms**

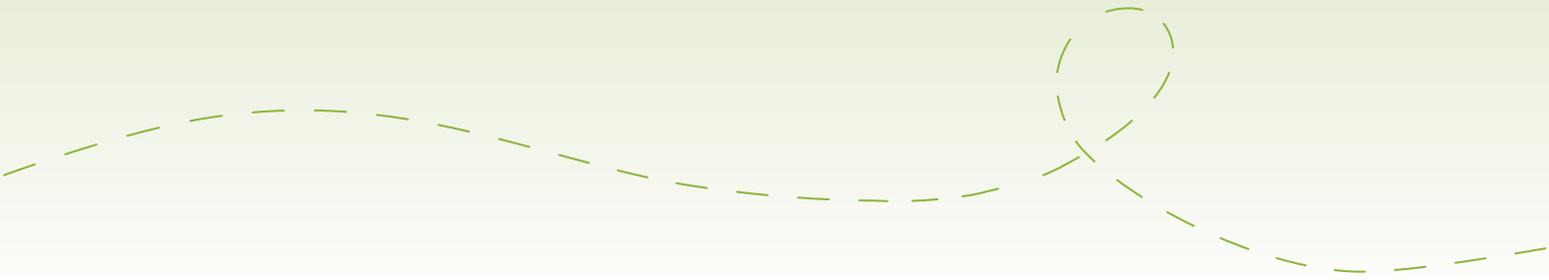
Recurrent infections can occur on any site but are more common on the face. The lips are most commonly affected, but infections can occur within the mouth, nose and eyes. The virus causes many painful blisters, which break down to form a collection of ulcers, which can take up to 14 days to disappear. When they appear on the lips they are commonly referred to as cold sores.

The child generally develops immunity after the onset of the primary infection and thereafter develops local lesions (a discreet cold sore). The infected child may suffer fever, malaise and irritability. Small clusters of vesicles rapidly erupt in the mouth and the gums will be very red and swollen and bleed if they are touched. When the vesicles burst, they form yellowish ulcers surrounded by a red halo. Joining of adjacent lesions forms large ulcers in the mouth including the lips and tongue.

Following the original infection, people may suffer from recurrent bouts. Recurrent herpes simplex tends to produce small clusters of vesicles that erupt and form slightly depressed, yellow-brown ulcers that have distinct red halos. Most people report symptoms such as tingling, throbbing and burning one to 24 hours before the eruption of the lesions.

### **Causes**

Recurrence can be caused by trauma to the skin and lips, other infections, sun exposure, emotional stress or there may not be any obvious reason.



**Age**

All ages can be affected by the recurrent herpetic infection.

**Duration**

Lesions can last seven to 14 days.

**Treatment**

Treatment involves applying antiviral creams during the prodromal (tingling) stage or anaesthetic ointments directly to the affected areas.

## 7.12 Hand, foot and mouth disease



*Hand ulcer*



*Mouth ulcer*

### **Prevalence**

Hand, foot and mouth disease occurs worldwide, sporadically and in epidemics. It is more common in summer and early autumn. Outbreaks occur frequently among groups of children in childcare centres and schools (DHS 2005).

### **Signs and symptoms**

Characterised by numerous shallow painful ulcers in the anterior mouth and on the hands and feet. Most children complain of a sore throat or mouth and may refuse to eat. A low grade fever lasting one to two days is accompanied by a distinctive pattern of oral vesicles and peripheral small flat blisters on the hands and feet, and occasionally on the buttocks. Hand, foot and mouth disease is mild and self limiting.

### **Causes**

Hand, foot and mouth disease is a symptom of the Coxsackievirus.

### **Age**

Occurs mainly in children under 10 years and in young adults.

### **Duration**

Seven to ten days.

### **Treatment**

Treatment for symptoms include antiseptic mouthwashes, simple analgesics and provision of fluids and a soft diet.

## 7.13 Measles



*Appearance of Koplik's spots prior to the eruption of skin lesions in measles*



*General skin rash and Koplik's spots in the mouth*

### **Prevalence**

Measles is now rare in Australia, and cases can usually be linked to its importation from endemic countries (Durrheim et al 2007).

### **Signs and symptoms**

Measles can be identified by the presence of characteristic mouth lesions called Koplik's spots. They are small white spots (like grains of salt) surrounded by a zone of inflammation and are often numerous on the inside of the cheeks or around the upper salivary duct in the upper cheek area. Koplik's spots appear about two to three days before the general rash and coincide with the most infectious period. They disappear with the development of the general skin rash that usually starts behind the ears and spreads down over the face and body. It consists of purplish or red raised spots that run together to form blotchy areas. Red eyes and a dry cough can also be features.

### **Causes**

Measles is caused by the measles virus (paramyxovirus).

### **Age**

Infants and children are especially vulnerable.

### **Duration**

Incubation period is approximately ten days, but varies from seven to ten days from exposure to the onset of fever. It is usually 14 days until the rash appears.

### **Treatment**

Because of the risk of complications, referral to a medical professional is required. The child should have an isolation period of at least five days from the appearance of the rash. The treatment is similar to that of fever, and involves analgesia for fever, and providing fluids and a soft diet.

## 7.14 Tongue tie (ankyloglossia)

Tongue tie is caused by a short frenum that restricts tongue movement.



*Tongue tie*

*Photo is courtesy of Associate Professor Janelle Aby*

### **Prevalence**

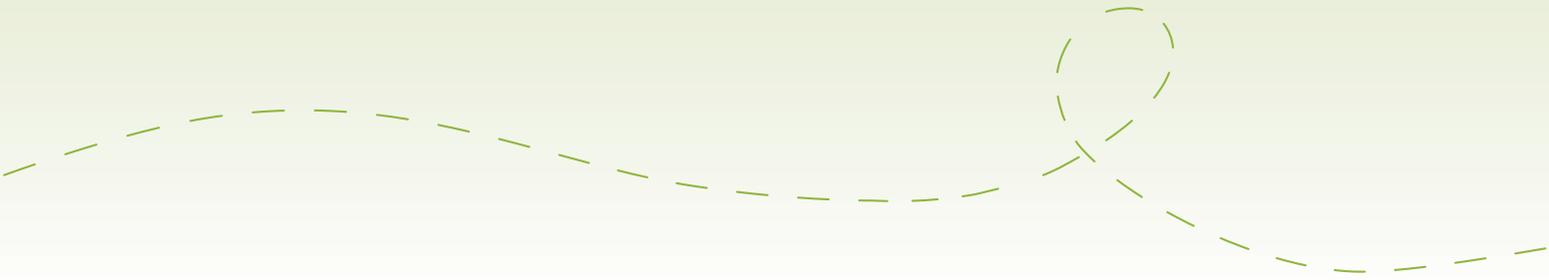
Some studies have shown that around three to five per cent of babies have tongue tie (Klockars 2007; Ricke et al 2005). Others found it to be much more common, affecting 10–11 per cent of babies (Hogan, Westcott & Griffiths 2005).

### **Signs and symptoms**

Many babies with tongue tie breast and bottle feed successfully, but a tight tongue tie can interfere with a baby's ability to breastfeed and, in some cases, bottle feed.

The symptoms of tongue tie can include:

- ❏ tongue can't poke out past the lips
- ❏ tongue tip can't touch the roof of the mouth
- ❏ tongue can't be moved sideways to the corners of the mouth
- ❏ tongue tip may look flat or square, instead of pointy when the tongue is extended
- ❏ tongue tip may look notched or heart shaped
- ❏ may have breastfeeding or bottle-feeding problems
- ❏ the front teeth in the lower jaw may have a gap between them.



Tongue tie can be hard to diagnose in newborns. It is important for a mother to consult with a medical professional or lactation consultant if they are having trouble breastfeeding. Signs that a baby could be tongue tied include:

- ❏ mother has sore nipples during and after breastfeeding
- ❏ mother has squashed nipples after breastfeeding
- ❏ mother has a white compression mark on the nipple after breastfeeding
- ❏ the baby has difficulty latching on to the nipple
- ❏ the baby often loses suction while feeding and sucks air
- ❏ the baby's mouth makes a clicking sound while feeding
- ❏ the baby fails to gain weight.

### ***Causes***

There are two main causes of tongue tie: either the frenum is too short and tight, or it failed to move back down the tongue during development and is still attached to the tongue tip. In the second case, a heart-shaped tongue tip is one of the obvious symptoms. It is not clear whether or not tongue tie is inherited.

### ***Age***

Tongue tie is congenital, but may not be noticed until the child has trouble eating or speaking.

### ***Duration***

Tongue tie can resolve in early childhood if the frenum loosens by itself, allowing the tongue to move freely for eating and speech. In some cases the child may need to have an operation (frenectomy) to release the tongue.

### ***Treatment***

The preferred treatment is to wait to see if the tongue tie resolves spontaneously. Where a newborn baby has feeding problems a consultation with a paediatrician or paediatric dentist is recommended.

Parents of tongue tied babies with feeding problems should see a lactation consultant or feeding specialist to confirm whether or not the tongue tie is causing the feeding problem.

Toddlers or older children should see a speech therapist to work out whether the tongue tie is causing the speech or eating problem.

## 7.15 Cleft lip and palate

A cleft is an incomplete fusion of the mouth parts during early foetal development. It may affect the lip and/or the palate of the upper lip. If the nose is affected, it is called a complete **cleft lip**. A **cleft palate** leads to an opening between the mouth and nose.



*Cleft lip*

*Photos courtesy of Associate Professor Janelle Aby*



*Cleft palate - only the lateral margins of the palate are visible*



*Normally formed palate*

### **Prevalence**

Approximately one in every 700 births are affected by cleft lip or palate or both (Hodgkinson et al 2005).

### **Signs and symptoms**

A cleft palate may lead to feeding problems, as the child is unable to achieve the suction necessary to draw the milk. When babies with cleft lip and/or palate feed they may:

- ❑ feed slowly
- ❑ cough and splutter during feeding
- ❑ become windy and need to be burped more frequently
- ❑ have milk escape from their nose during feeding (nasal regurgitation), especially if the flow of milk from the teat is fast
- ❑ fail to gain appropriate weight for age.

### **Causes**

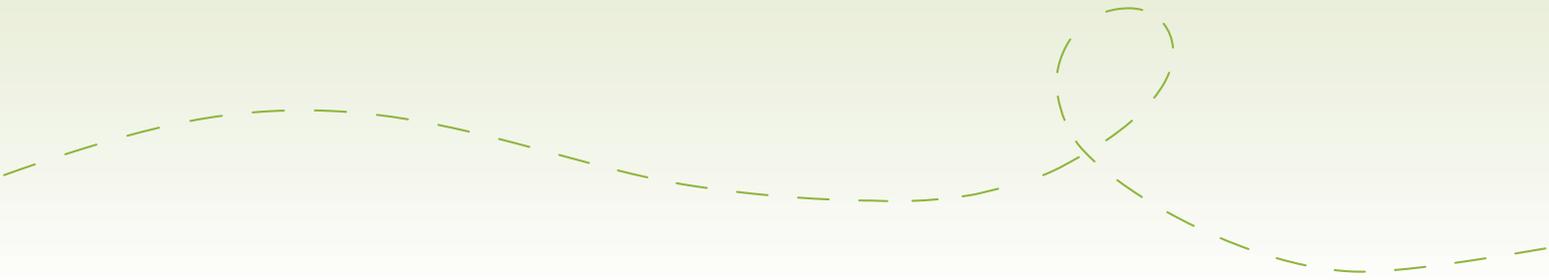
The cause of a cleft lip and/or palate is unknown. In some cases it might be hereditary.

### **Age**

While a cleft lip and/or palate is apparent at birth, a cleft palate may be overlooked until other signs and symptoms are present.

### **Treatment**

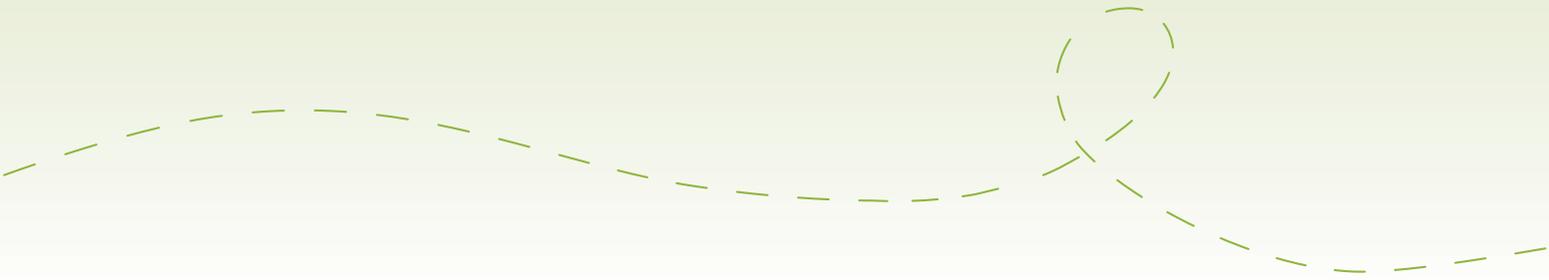
- ❑ Referral to a paediatrician is required if a previously undiagnosed cleft palate is suspected.
- ❑ The amount of treatment required for a child with a cleft lip or palate depends on a range of factors, and severe defects do not always require complex treatment.
- ❑ Depending on the case, a range of specialists may be required, including audiologists, dental specialists, ear, nose and throat surgeons, oral and maxillofacial surgeons, paediatricians, plastic surgeons and speech pathologists.



## 7.16 Asthma

### ***Oral effects***

Asthma medication comprises bronchodilators, corticosteroids and anticholinergic drugs. Most of these drugs are inhaled using various forms of inhalers or nebulisers. Patients taking asthma medication may be at risk of dental caries, dental erosion, periodontal diseases and oral candidiasis (thrush). It is recommended that patients with asthma receive regular oral examinations.



## 7.17 Diabetes

### **Oral effects**

Diabetes can affect the teeth, periodontium (gums), and the oral mucosa.

- ▣ Teeth: diabetics are often on tooth-friendly low-carbohydrate diets, but they are at increased risk of dental caries because of elevated salivary glucose levels and decreased salivary flow.
- ▣ Periodontitis: poorly controlled diabetics are more likely to develop periodontitis (gum disease) and other periodontal pathology.
- ▣ Oral Mucosa: diabetics have increased risk of candidal infections and ulcers as well as other oral mucosal changes.



## 8. Dental Services

### This section covers:

- 8.1 Overview of the public dental system
- 8.2 Access for children to the public dental system
- 8.3 The Royal Dental Hospital of Melbourne
- 8.4 Community dental service contacts
- 8.5 Private dental services
- 8.6 Other useful contacts

### 8.1 Overview of the public dental system

#### **Eligibility**

Public dental services (including denture and specialist care) are provided to eligible Victorians through community dental clinics in community health services, rural hospitals and the Royal Dental Hospital of Melbourne.

The following groups are eligible for public dental services:

- ✦ All children aged 0–12 years.
- ✦ Young people aged 13–17 years who are health care or pensioner concession card holders, or dependants thereof.
- ✦ All children and young people up to 18 years of age in residential care provided by the Children, Youth & Families division of the Department of Human Services.
- ✦ All youth justice clients in custodial care, up to 18 years of age.
- ✦ Children enrolled in special development schools.
- ✦ People aged 18 years and over who are health care or pensioner concession card holders or dependants of concession card holders.
- ✦ All refugees and asylum seekers.
- ✦ All Aboriginal and Torres Strait Islander people who wish to be treated at the Royal Dental Hospital of Melbourne.

(Department of Health 2010)

### **Victorian concession cards include:**



*Health Care Card*



*Pensioner Concession Card*

### **Priority access**

People who have priority access will be offered the next available appointment for general care and will not be placed on the general care wait list. Where you have denture care needs, you would be offered the next available appointment for denture care or placed on the priority denture list, where applicable.

The following groups have priority access to care:

- ✦ Aboriginal and Torres Strait Islanders
- ✦ children and young people (under 18 years of age)
- ✦ homeless people and people at risk of homelessness
- ✦ pregnant women
- ✦ refugees and asylum seekers
- ✦ registered clients of mental health and disability services, supported by a letter of recommendation from their case manager or staff of special developmental schools.

All other people seeking routine general and denture care will need to place their name on a waiting list. Clients seeking urgent dental care should be triaged, assessed and managed for their emergency (Department of Health 2010).

### **Fee exemptions**

Free treatment for public dental services applies to the following:

- ✦ Aboriginal and Torres Strait Islanders
- ✦ homeless people and people at risk of homelessness
- ✦ refugees and asylum seekers
- ✦ children and young people aged 0–17 years who are health care or pensioner concession card holders or dependants of concession card holders
- ✦ all children and young people up to 18 years of age who are in residential care provided by the Children, Youth & Families division of Department of Human Services
- ✦ all youth justice clients up to 18 years of age in custodial care
- ✦ registered clients of mental health and disability services, supported by a letter of recommendation from their case manager or staff of special developmental schools
- ✦ those receiving care from undergraduate students
- ✦ those experiencing financial hardship.

(DHSV 2010)

## 8.2 Access for children to the public dental system

### **Eligibility**

- ✦ All children who are 12 years and under are eligible to access the public dental system through community dental clinics.
- ✦ Children receive general oral health advice as well as dental check-ups and treatment.
- ✦ Children will receive priority access, meaning they do not have to go on a waiting list and will be given the next available appointment.
- ✦ This service is free for those who hold a valid health care card or a pensioner concession card.
- ✦ A fee of \$29\* for a course of general care per child applies to non-card-holders (the most a family will pay is \$116\*).

\* Fees are subject to change

### ***When should children visit an oral health professional, and how frequently?***

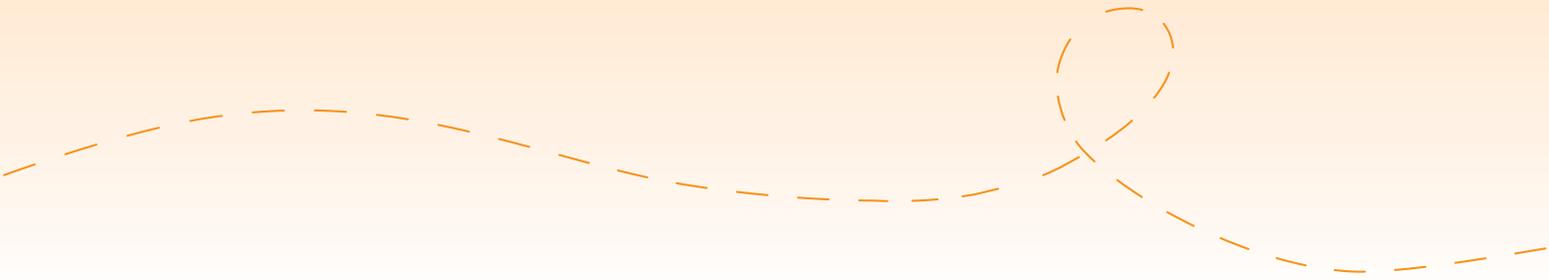
Two years of age is a good time to take a child to see an oral health professional. These early visits can create a positive experience for both child and parent and help with early diagnosis and prevention of oral disease. A child should be taken to see an oral health professional immediately if a problem is identified. The oral health professional will recommend how regular visits should be.

### ***Type of treatment and care for children***

Following an examination, treatment and care provided may include:

- ✦ fissure (dental) sealants — a tooth-coloured plastic film that is professionally applied to the deep groves on the back of the teeth where decay most often starts.
- ✦ application of fluoride
- ✦ scaling and cleaning
- ✦ fillings in deciduous and permanent teeth
- ✦ radiographs (x-rays)
- ✦ extractions
- ✦ oral hygiene instruction and dietary advice.

Generally, dental therapists provide general dental care, while more complex care is performed by dentists. Referrals to dental specialists can also be arranged for eligible children. One of the main reasons children are referred to the Royal Dental Hospital of Melbourne is for treatment under a general anaesthetic. Children may be referred through any dental provider, including community dental clinics or private oral health professionals.



### 8.3 The Royal Dental Hospital of Melbourne

Oral health care can be provided to eligible Victorians through the Royal Dental Hospital of Melbourne. Emergency dental care is available to all Victorians.

#### **General enquiries**

Telephone: (03) 9341 1000 or 1800 833 039 for country calls

Location: 720 Swanston Street, Carlton, Victoria, Australia, 3053

Hours of operation: Monday to Friday only: 8:30 a.m. to 5:00 p.m.

#### **Emergency**

Telephone: 1300 360 054 (standard charges apply)

Location: 720 Swanston Street, Carlton, Victoria, Australia, 3053

Hours of operation: Monday to Friday: 8:30 a.m. to 9:15 p.m.

Weekends and public holidays: 9:00 a.m. to 9:15 p.m.

### 8.4 Community dental service contacts

To find the closest community dental service, call 1300 360 054. The Dental Health Services Victoria website ([www.dhsv.org.au](http://www.dhsv.org.au)) also provides a listing of community dental services by region.

### 8.5 Private dental services

Private dentists are listed in the Yellow Pages (under 'dentists') in alphabetical order or by area.

The Australian Dental Association can also provide names of most private dentists. Visit [www.ada.org.au](http://www.ada.org.au) and go to 'find a dentist'.

## **8.6 Useful contacts and websites**

### ***Australian Dental Association (Victorian branch)***

Ph. (03) 8825 4600

[www.ada.org.au](http://www.ada.org.au)

### ***Better Health Channel***

[www.betterhealth.vic.gov.au](http://www.betterhealth.vic.gov.au)

### ***Colgate***

Ph: 1800 802 307

[www.colgateprofessional.com.au](http://www.colgateprofessional.com.au)

### ***Dental Health Services Victoria***

Ph. (03) 9341 1203 (Health promotion team)

Email: [health.promotion@dhsv.org.au](mailto:health.promotion@dhsv.org.au)

[www.dhsv.org.au](http://www.dhsv.org.au)

### ***Department of Education and Early Childhood Development***

[www.education.vic.gov.au/](http://www.education.vic.gov.au/)

### ***Department of Health***

[www.health.vic.gov.au/](http://www.health.vic.gov.au/)

### ***Health Translations Directory***

[www.healthtranslations.vic.gov.au](http://www.healthtranslations.vic.gov.au)

### ***Oral B***

Ph. 1800 641 820

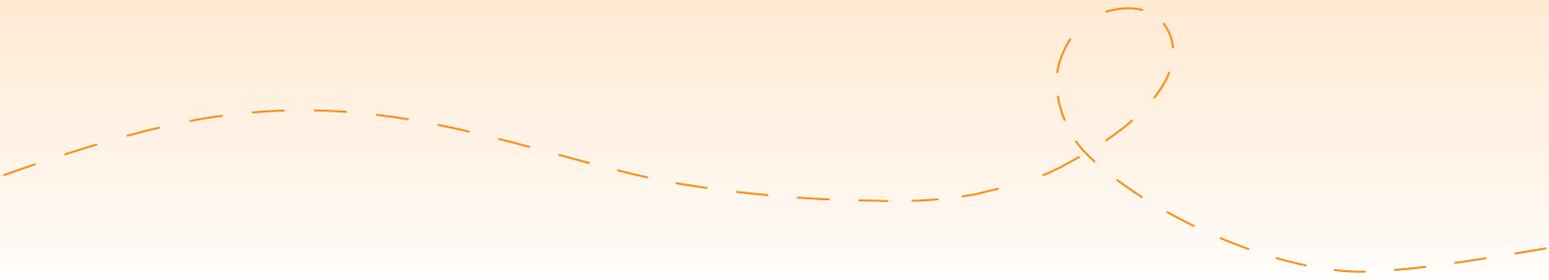
[www.oralb.com.au](http://www.oralb.com.au)

### ***Oral health promotion clearing house***

[www.adelaide.edu.au/oral-health-promotion/](http://www.adelaide.edu.au/oral-health-promotion/)

### ***Raising children's network***

[www.raisingchildren.net.au/](http://www.raisingchildren.net.au/)



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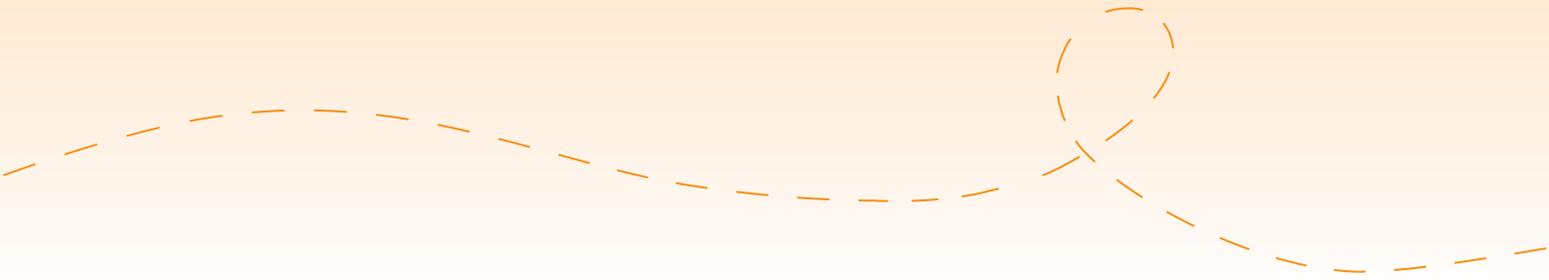
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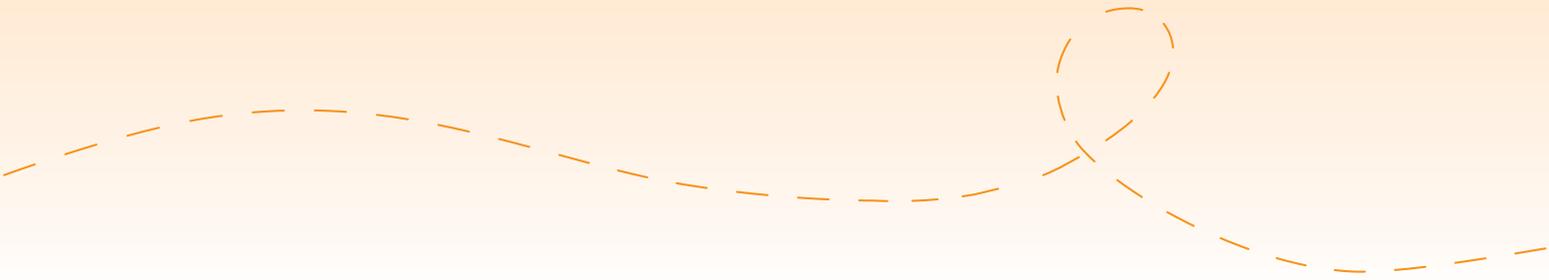
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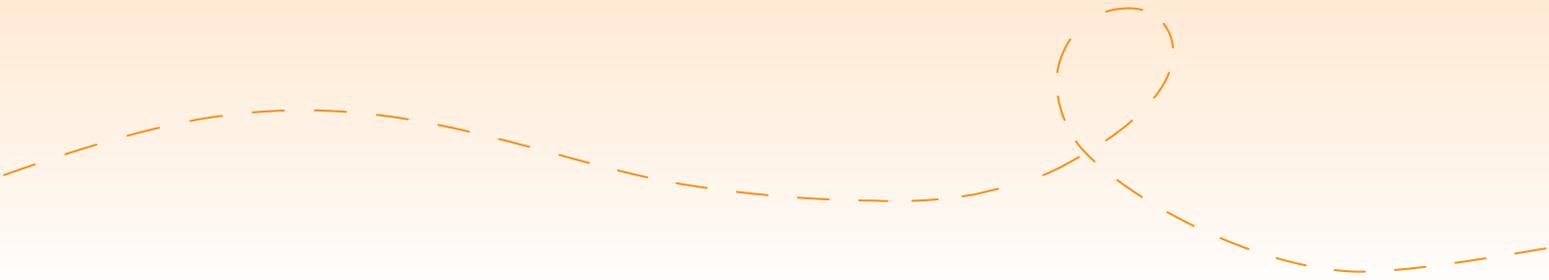
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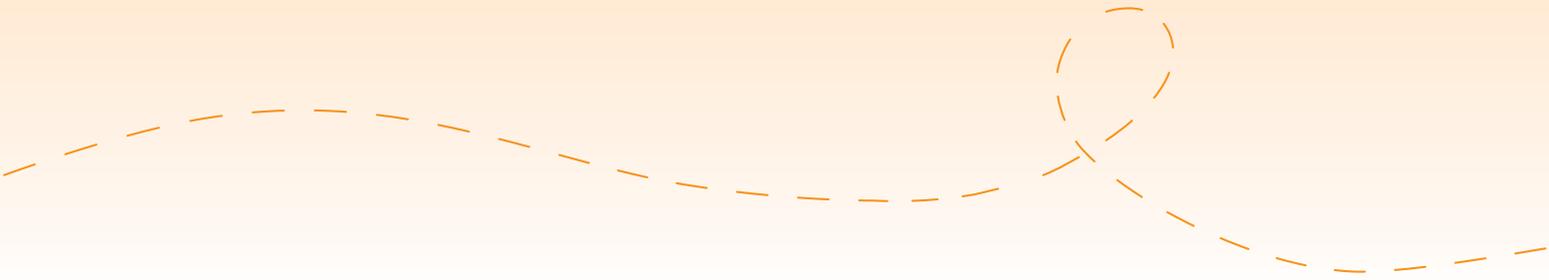
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