Human
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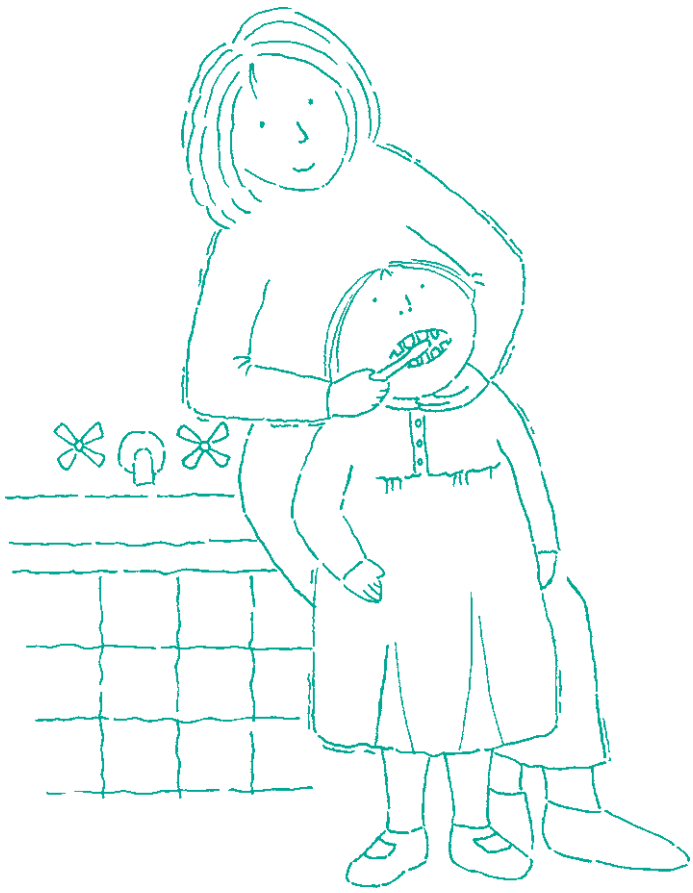
Dental Health for Children 0–6 Years

Information for Maternal and Child Health Nurses



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Foreword

This resource manual is part of a joint initiative to improve the oral health of preschool children in Victoria.

Office of the Family, (Youth & Family Services—Department of Human Services); Health Development Section (Public Health, Department of Human Services) and Dental Health Services Victoria, have worked together to devise a program that aims to:

- Provide oral health information to maternal and child health nurses and their clients.
- Screen for oral abnormalities such as dental decay (nursing caries).
- Refer dental problems onto a dental professional.

The content of this resource manual is based on the Child and Youth Health and the South Australian Dental Service, Nursing Decay Information Booklet, 1996. Changes to the text and format have been made in consultation with the Victorian reference group.

This resource has accompanying support material such as photos and recent research articles and can be used as a reference and guide in providing dental information for families with young children.

Contents

Introduction

This manual is one of many resources produced to support the Victorian School Dental Service, Child and Adolescent Health Promotion Strategy 1995–2000 in its goal to:
reduce the incidence of dental caries and periodontal disease amongst Victorian Children (0–12 Years).

It is intended to increase the percentage of caries-free five-year-olds to 62 per cent by the year 2000. The Health Development Unit, Office of the Family and Dental Health Services Victoria have worked together to devise a program that aims to:

1. Reduce the incidence of dental caries (nursing caries) in Victoria's children with the assistance of maternal and child health nurses.

2. Advise maternal and child health nurses of issues relating to prevention of dental disease and dental health promotion.

3. Provide maternal and child health nurses with the knowledge and skills to detect early signs of nursing caries in young children (0–6 year olds) and to refer identified problems onto a dental professional.

Program Goals for 0–6 Year Age Group

For Parents and Caregivers

All parents are to be provided with dental health information via the *Victorian Child Health Record* recommended health surveillance stages at:

- 6–8 weeks
- 6–8 months
- 18–21 months
- 3 to 3 $^1/_2$ year
- School entry
- School age
- Adolescence.

For the Child

The child will receive a mouth examination (teeth, gums and other soft tissues) by the maternal and child health nurse. If assessed to be at risk of early dental decay (nursing caries), the child will be referred to a public or private dental provider for counselling and/or treatment.

Program Objectives

1. To develop a resource manual and photocard and deliver a half-day workshop to all Victorian maternal and child health nurses.

2. To provide maternal and child health nurses with a checklist that will help them promote relevant dental health issues with parents of children 0–6 years of age at the recommended child health surveillance stages.

3. To ensure that maternal and child health nurses can identify the early signs of dental caries (nursing caries).

4. To ensure that maternal and child health nurses have access to this resource manual.

Tooth Development

Growth and Development—Life Cycle of a Tooth

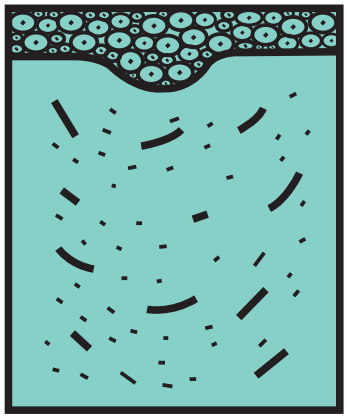
The formation of deciduous teeth is a process that begins during the fifth or sixth week in utero. The lower anterior teeth are formed first followed by the upper anterior teeth. This process continues after birth until the full set of ten upper (maxillary) teeth and ten lower (mandibular) teeth are formed.

Permanent teeth begin forming during the fourth or fifth month 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 are formed.

Deciduous teeth take two to three years to form and permanent teeth nine to ten years.

Tooth development starts with the formation of a tooth germ which produces the different layers of the tooth. This stage is often referred to as the 'bud stage' because the tooth layers thicken and grow downwards resembling the shape of a bud.

Bud Stage



The cells multiply at a rapid rate and take on the shape of a 'cap'. The tooth buds of the permanent teeth begin to form.

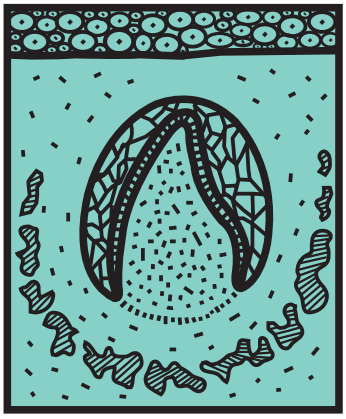
Cap Stage

As the cells increase in number, they assume the shape of a bell. Later the cells become specialised and form the different layers of the tooth.

Bell Stage

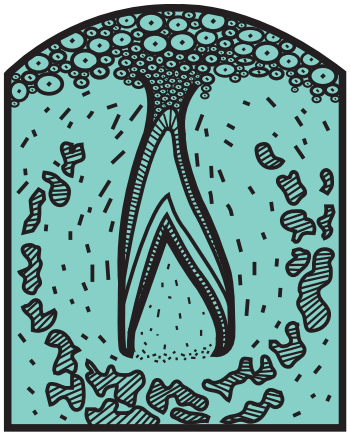
While the tooth germ is developing, the surrounding area of the jaw also continues to develop. The bone cells form the upper jaw (maxilla) and the lower jaw (mandible). The tooth takes on the shape of a crown and a root.

Assumes Shape of a Tooth



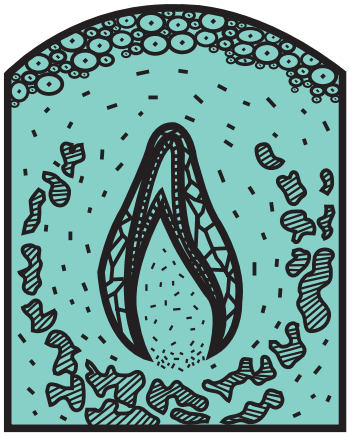
In the final stage of tooth development, the different layers calcify. Once a tooth is formed it cannot repair itself (if damaged) like bone or skin. Damage at this point can have a great impact on the health of teeth.

Tooth Mineralises



During the final stages of tooth formation, the enamel and dentine increase in layers until the tooth is completely shaped. However, 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 is attained.

Tooth Completely Shaped



Tooth Structure

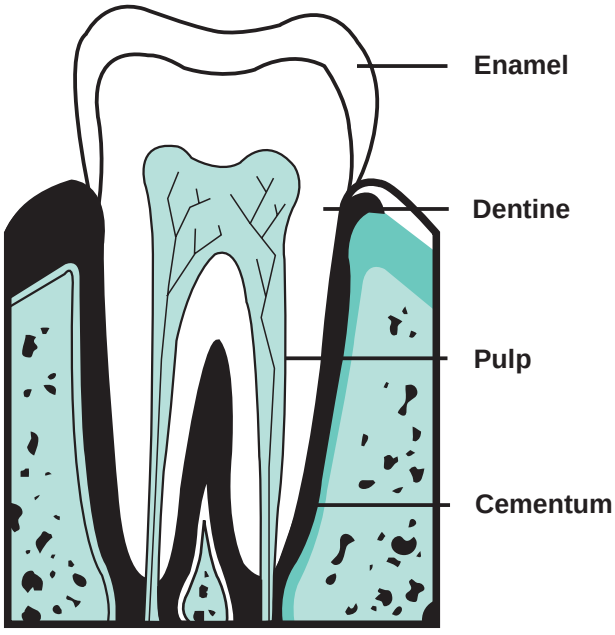
The portion of the tooth visible in the mouth is called the crown. The crown is covered with **enamel** which is a hard, white, shiny substance. Enamel is highly calcified bone and is the protective layer of the tooth.

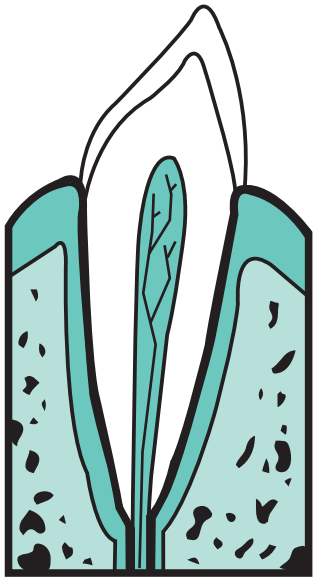
Enamel is made up of millions of tiny rods which form the framework of the tooth. It is thickest at the biting surface of the tooth and very thin near the gum line. The colour of enamel ranges from yellow to white depending upon its translucency—the more translucent the enamel, the more the yellow colour of the underlying dentine is apparent. The enamel portion of the tooth has no feeling. Even though the enamel is very hard, it can wear away due to attrition (abrasion) or erosion (be dissolved by acid), and it may be fractured due to stress, and/or affected by dental decay.

The layer found under the enamel is the **dentine**. It forms the bulk of the crown and the roots and is yellowish in colour. Dentine is softer than enamel and carries sensations such as temperature and pain to the 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.

Cementum forms a very thin layer over the root of the tooth and is similar to bone. It is yellowish 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).





Tooth Types

Deciduous Teeth

Deciduous teeth are also known as baby teeth, milk teeth, primary teeth or first teeth.

They are shed and replaced by **permanent teeth**—this process is called **exfoliation**.

Deciduous teeth are much whiter than permanent teeth and are also softer. Therefore, deciduous teeth can appear very worn due to grinding and normal wear through eating.

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

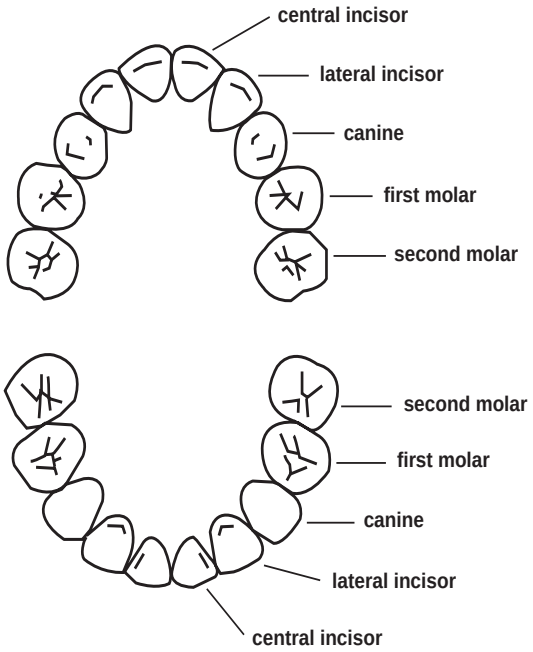
In the **upper arch** (maxilla) there are ten deciduous teeth:

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

In the **lower arch** (mandible) there are ten deciduous teeth:

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

Deciduous Teeth



Healthy deciduous teeth are important for:

- Efficient mastication of food.
- Maintaining normal facial appearance.
- Formulating clear speech.
- Maintaining a proper diet—missing or badly decayed teeth may cause young children to reject foods that are difficult to chew.
- Maintaining space for the permanent teeth.
- Jaw development.
- 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.

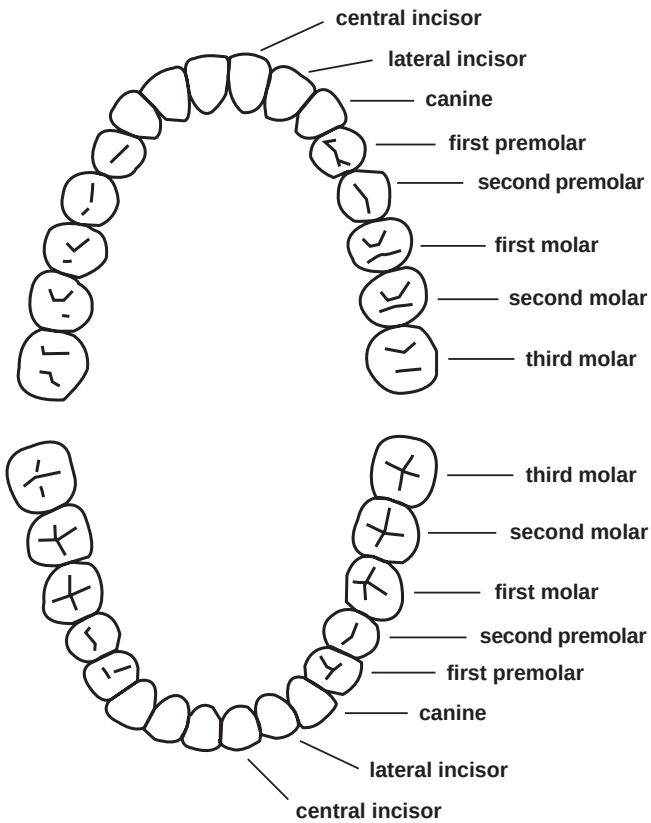
In the **upper arch** (maxilla) there are 16 permanent teeth:

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

In the **lower arch** (mandible) there are 16 permanent teeth:

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

Permanent Teeth



Tooth Eruption

Deciduous Teeth

Although deciduous teeth begin to form in utero, they do not usually begin to erupt till six months of age. Eruption times vary from child to child just as the individual growth rate varies.

Normally no teeth are visible in the mouth at birth. Occasionally, however, some babies are born with an erupted incisor tooth (neonatal tooth), but these are not true teeth and are usually lost soon after birth.

Deciduous teeth do not usually begin to erupt until six months of age.

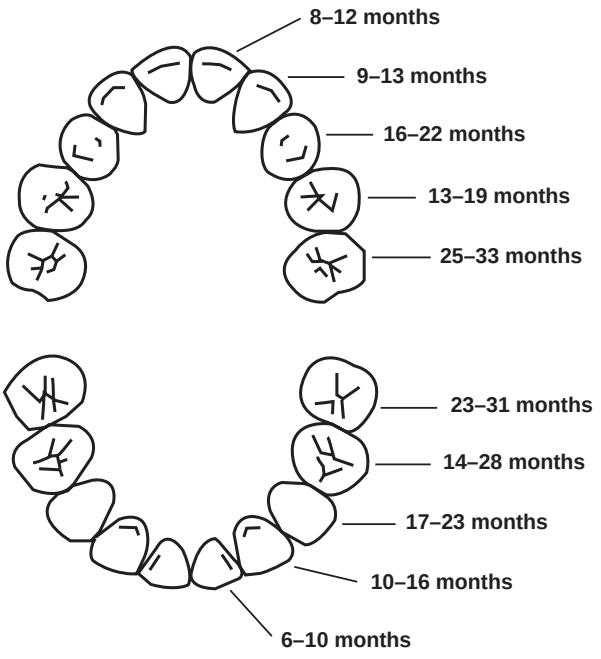
Eruption Patterns

- 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.

By the time the child reaches the age of two to three years of age, all the deciduous teeth should have erupted.

Usual Eruption Sequence for Deciduous Teeth

Tooth	Months (approx)
lower central incisor	6–10
lower lateral incisor	10–16
upper central incisors	8–12
upper lateral incisors	9–13
lower first molars	14–28
upper first molars	13–19
lower canines	17–23
upper canines	16–22
lower second molars	23–31
upper second molars	25–33



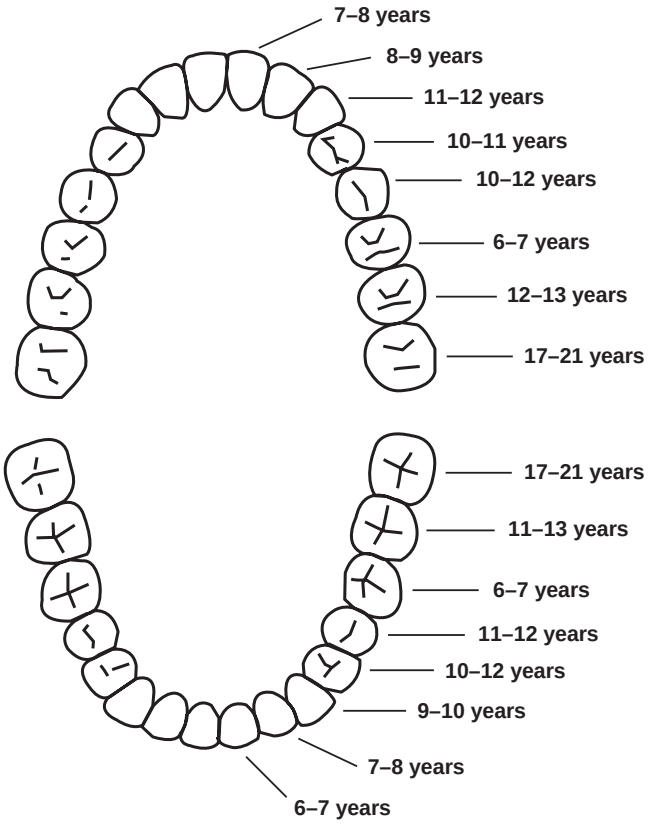
Permanent Teeth

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

Between the age 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.

Usual Eruption Sequence for Permanent Teeth

Tooth	Years (approx.)
lower first molars	6–7
upper first molars	6–7
lower central incisors	6–7
lower lateral incisors	7–8
upper central incisors	7–8
upper lateral incisors	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



Common Issues in Tooth Development

Teething

Teething refers to the eruption of the deciduous and permanent teeth. It is a natural occurrence and can happen without any problems. However, some children may feel discomfort before their first tooth erupts (at about six months) and may continue to experience this discomfort with every one of their 20 baby teeth.

When teething, children may be irritable and may place objects or fingers in their mouth and bite on them. Dribbling may increase and the child may be very choosy about foods or refuse foods altogether. The gums may appear red and swollen and if pressed, may feel hard and pointed.

Signs of teething may include a rise in temperature, redness and swelling. Restlessness by day, sleeplessness by night, rashes or diarrhoea are also associated with teething.

Temporary relief may be achieved if baby is given something to bite on such as a cold teething ring, dummy or toothbrush. Mushy food is also a good idea at this time as it requires less chewing.

Using lemon juice on gums to relieve teething is **not** recommended if any teeth are present. Lemon juice is very acidic and can dissolve tooth enamel, especially newly erupted baby teeth.

Thumb and Finger Sucking

Questions often arise concerning infants and non-nutritive sucking, that is sucking thumbs, fingers, pacifiers and other objects. Numerous studies indicate that a large majority of newborns suck their digits, but the percentage drops with increasing age. These studies indicate that most children spontaneously **discontinue** non-nutritive sucking sometime between two and four years of age (Traismann and Traismann, 1958; Nowak et al, 1986).

Children often combine a sucking habit with another repetitive activity such as carrying a personal blanket or toy while sucking their thumb or playing with their hair. Tired, stressed or hungry children are more likely to suck their thumbs as are children in a new or threatening environment.

Generally, sucking on fingers, thumbs and toys is healthy and normal in infancy and should not be a cause for parental alarm.

Effects of Thumb Sucking

The effects of non-nutritive sucking on the developing deciduous teeth are usually totally reversible up until the age of six to seven years when the permanent teeth start to erupt. Beyond the age of seven, dental problems may occur due to bony structural changes.

Extensive sucking of fingers or thumbs has a tendency to push the front teeth out of alignment causing teeth to protrude (buck teeth). This may alter the growth of the face) and cause an open bite. Preschool children who suck their thumb or fingers may develop a lisp. The 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.

How To Help Children Break the Habit

Children must make the decision to stop sucking their thumbs or fingers before the habit will cease. Parents, maternal and child health nurses and dental clinic staff can assist children to achieve their goal through a variety of methods. Remember, what is effective will depend on each individual child and their situation.

- Give the child a reward, such as a hug or praise, to reinforce their determination to stop the habit.
- Put up a calendar on which a star or a tick is placed for each period the child does not suck their thumb. After the successful period, reward the child with a treat such as a special outing, a toy or a special privilege.
- Place sticky plaster on the thumb before bedtime to remind the child not to place the thumb in the mouth.
- Encourage a bond with a special toy.
- Buy a special glove, chosen by the child, and thread ribbon through the glove (to prevent it from being removed) so that it can be fitted to the hand during times of need.
- Place unpleasant tasting nail paint, (available from pharmacies) on the fingers or thumb.

How Often Should Rewards Be Given?

The younger the child the more frequent the reward must be given. A five to six-year-old may need some special reward after the first difficult night. Reward periods can gradually be stretched out to several nights, a week and eventually a period of 30 nights without sucking. Some children do not lose the impulse to suck until they have collected as many as three to four awards.

Thumb Sucking Versus a Pacifier

This is a question that is commonly asked by parents. Studies of thumb suckers show they have a greater problem in breaking their habit than do dummy suckers. (Naturally one can lose or misplace a dummy and go cold turkey, however it is a little more difficult to lose a thumb).

Can Parents Become Overly Concerned About Their Children's Sucking Habits?

Yes. Frequent repetition by parents to take the child's thumb out of their mouth can be counterproductive. It is children and not parents who must learn to control the habit. If children feel they are being nagged they will become defensive and view parents as the opposition and not an ally in the fight against sucking. Occasional good humoured comments that bring the sucking activity to the child's notice can be helpful.

What Frustrations Do Children Face when They Attempt To Break a Sucking Habit?

A child's first days without sucking are usually the most difficult. Like all habits, the yearning slowly diminishes and eventually becomes easier. Parents and other family members can offer encouragement and rewards. Family members need to be patient to assist children through their difficult time.

Often children who have stopped sucking can drift back to their old habit and it can be frustrating for all concerned. It may take several attempts before the habit is completely broken.

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. As discussed above, stopping the habit relies on the child wanting to stop.

Strategies may include:

- Giving the child a reward such as a hug or praise to reinforce the child's determination to stop the habit.
- Putting up a calendar and placing a star or a tick for each period when the child does not suck their lip. After the successful period the child is rewarded with a treat such as a special outing, a toy or a special privilege.

Common Oral Pathological Conditions in Children 0–5 Years

Aphthous Ulcers

Aphthous ulcers occur in approximately 20 per cent of the population and are characterised by painful, recurrent solitary or multiple lesions or ulcerations. They are usually a few millimetres in size. There is no preference for age, sex or race. Aphthous ulcers can occur in any site in the mouth and heal spontaneously in two to four weeks.

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 small children.

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

Traumatic Ulcer

A traumatic ulcer may be the result of damage caused by a sharp object, cheek biting or eating overheated foods or drinks. These ulcers usually heal within a week.

Thrush

Thrush is a fungal infection also known as a Monilia or Candida Albicans. It is a fungus that affects the superficial layers of the mouth tissues. Thrush commonly occurs in young babies and infants.

Thrush is generally a local surface infection that produces milky white patches in the mouth. These patches are not as easily wiped off as milk curd. It 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.

Treatment consists of antifungal agents applied directly to the affected areas.

Herpes

The herpes simplex virus which causes cold sores on the lips, can also cause a general infection of the mouth and nose. The virus causes many painful ulcers which can take up to 14 days to disappear. It is usually transmitted to the child by a parent, relative or friend who has active cold sores when kissing the child.

This primary form of infection usually occurs before the child is five years of age. The child generally develops immunity after the onset of the primary infection and thereafter develops local lesions, that is 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.

Treatment of herpes involves maintenance of a nutritious and substantial diet. Fluid intake must be maintained and bland foods such as yoghurt and custard should be offered. Avoid salty, spicy or acidic foods as they irritate the mouth. Herpes usually heals within 12 to 20 days.

Recurrent Herpes Simplex

Following the original infection, people may suffer from recurrent bouts which are often precipitated by a triggering event such as sunlight, heat, stress, fever or trauma. Recurrent herpes simplex tends to produce clusters of vesicles that ulcerate. The lesions are characterised by the appearance of small clusters of vesicles that erupt and form slightly depressed, yellow-brown ulcers that have distinct red halos. Most people complain of tingling, throbbing and burning 24 hours before the eruption of

the lesions. Vesicles rupture to form painful lesions. When they appear on the lips they are commonly referred to as cold sores.

Treatment involves applying antiviral creams or anaesthetic ointments directly to the affected areas.

Measles

This common infection 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 2–3 days before the general rash and coincide with the most infectious period. They disappear with the development of the general skin rash.

Hand-Foot-and-Mouth Disease (HFM)

HFM is a common viral illness characterised by vesicular lesions 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, chiefly on the tongue and buccal mucosa and peripheral lesions on the hands and feet, and occasionally on the buttocks.

HFM is mild and self-limiting. Treatment is supportive.

Eruption Cyst

An eruption cyst appears as a smooth, localised dome-shaped swelling. It is bluish in colour and overlies an erupting tooth. The cyst drains once the tooth erupts and usually no treatment is necessary.

Geographic Tongue

Geographic Tongue is a term describing a patchy appearance of the tongue. It is characterised by single or multiple areas of pink to red smooth patches where the taste buds appear to be absent. The areas continually change position and migrate from site to site. It is a benign condition and generally does not require any treatment.

The patches on the tongue may become tender especially to spicy and acidic foodstuffs. Parents should be assured that Geographic Tongue is of a benign nature.

Abscess

An abscess is an infection around the root of a tooth. An abscess on a deciduous tooth can affect the development of the permanent tooth. It is often referred to as a gum boil. An abscess generally appears as a pimple on the gum around the affected tooth. When pressed there may be a discharge of pus. The child should be referred to a dental professional so that the tooth can be treated.

Treatment of Avulsed (Knocked Out) Teeth

Deciduous Teeth

If a deciduous tooth is avulsed, **do not place it back in the socket**. Deciduous teeth which have been replaced tend to fuse themselves to the tooth socket and difficulties arise when it is time for the tooth to be shed. Also, the permanent tooth underneath can be damaged when the deciduous tooth is replaced.

Permanent Teeth

If a knocked out permanent tooth can be replaced in the socket immediately it has an excellent chance of surviving. Every minute the tooth is out of the socket decreases the chance of the tooth surviving. Dental advice should be sought straight away.

First Aid Procedures

1. Find the tooth.

2. Handle the tooth by its crown, not by its root.

3. If root has debris on it, gently rinse tooth in saliva, milk or cool water for a few seconds only.

4. Do not attempt to clean the tooth with vigorous scrubbing or cleaning agents.

5. Replace the tooth in its socket immediately. Hold the tooth in place with some foil and/or by gently biting on a handkerchief.

6. Contact your dental professional immediately.

If you cannot replace the tooth in its socket:

1. Wrap the tooth in glad wrap or store in milk.

2. Seek dental help immediately, as it is essential that the tooth be replaced as quickly as possible.

Dental Health and Preventive Information

Dental Caries

Dental caries is a multifactorial disease. The factors involved include:

- tooth/teeth
- bacterial dental plaque
- fermentable carbohydrates
- acidic foods and drinks
- time
- saliva.

Teeth

Genetic structure, eruption sequence, position and closeness of teeth can predispose them to decay. For more detailed information see the section on Tooth Development.

Bacterial Dental Plaque

Immediately after cleaning teeth, a thin organic layer called **acquired pellicle** rapidly forms on the teeth. It cannot be removed by forceful rinsing. Although it does not initially contain microorganisms, it is soon colonised by various cocci and rod bacteria. Once bacteria are established this is called **bacterial dental plaque**.

Bacterial dental plaque continues to form 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 surface and each other. They also reduce the buffering action of saliva. A by-product of this process is the production of acid which can dissolve tooth structures.

Plaque is always present on the teeth, even after thorough cleaning, as many sites are not easily cleaned.

Fermentable Carbohydrates

This refers to sugars and starches that can be converted into acids by microorganisms. They are generally simple sugars such as glucose, sucrose, fructose, maltose and lactose. Microorganisms in the mouth can ferment simple sugars to polysaccharides forming acids as a by-product. When considering the relationship of the diet and dental decay, 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 decay. This factor is the one 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 decay 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 or some fruit juices) are consumed frequently, they have the potential to dissolve tooth structures.

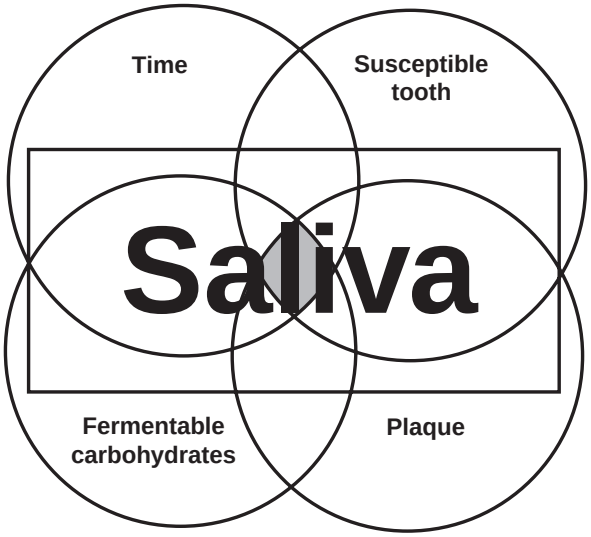
Time

The time it takes for teeth to decay varies and is influenced by many factors such as areas affected on the teeth, position of teeth in the mouth, the length of time the teeth have been in the mouth and individual differences. For example, new baby teeth can decay very rapidly if frequently exposed to sugar as they have not had very long to be strengthened by the topical effect of fluoride in the mouth.

Saliva

The ability of the saliva to neutralise acid and aid in the remineralisation of enamel affects the decay process. The rate of flow of the saliva is an important factor in dental decay. A steady flow of saliva assists the pH to return to normal in a relatively short time, provided oral hygiene is good. The saliva buffers the acids and provides minerals necessary for the remineralisation of tooth

enamel. Diseases and drugs which reduce the flow of saliva also increase the risk of tooth decay. When a person sleeps, the saliva rate slows down.



Infant Feeding Caries

The unique distribution of infant feeding caries between the upper and lower incisors and the variation in severity of the carious lesions between the incisors and other teeth is related to three main factors:

- The pattern of eruption of primary teeth.
- Duration of the sucking habit.
- The muscular pattern of infant sucking.

Between six and nine months, infants usually get their first teeth. The newly erupted teeth are particularly at risk of dental caries since maturation of the enamel with fluoride is yet to occur. Dental caries is an infective process initiated by the transmission of oral bacteria (Streptococcus mutans) from parent to infants. This transmission appears to be from mother to infant by way of saliva, possibly by the mother using her eating utensils to feed the infant, by kissing, or by the infants placing their fingers into their mother's mouth and then into their own.

If the infant has a high sugar diet, or the bottle (containing fluids other than water) is used as a pacifier, these bacteria become well established and multiply. This may result in infant feeding caries.

During sucking, the natural or artificial nipple rests against the 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 physically protected by the tongue. If the 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 it will be converted by the bacteria into acids that demineralise the enamel surface of the teeth. In this stagnant acid environment, infant feeding caries can develop quickly. This can occur in children as young as 6–12 months. 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.

Key Signs of Infant Feeding Caries

- Initially, the upper incisors develop a dull white band (demineralisation) along the gum line that usually goes undetected by the parents/carers.
- As the condition progresses, these white areas develop into cavities that girdle the necks of the teeth in a yellow, brown or black collar.
- In advanced cases, the crowns of the four upper incisors may be destroyed completely leaving decayed brownish-black root stumps. The four lower incisors remain relatively unaffected.

Parents usually first notice these cavities when the child is about 20 months old. At this age, the treatment may be difficult, costly and distressing to both parents and infants. Treatment frequently requires general anaesthesia in an operating theatre.

Early detection of infant feeding caries is necessary to prevent this hardship for both the child and parents.

Prevention

Infant Feeding Caries

Education of parents and carers on diet and nutrition, recommended nursing techniques, oral hygiene procedures, appropriate use of fluoride and early detection of dental disease will assist in the prevention of infant feeding caries. Following are some recommended practices that will help prevent infant feeding caries.

Feeding

Breastfeeding is the preferred method of infant feeding and carries a reduced risk of infant feeding caries. However, it is the frequency and duration of consumption as well as the time (that is, during waking hours or during sleep when saliva flow is reduced) which are the contributing factors to the development of infant feeding caries. Where breastfeeding is not possible or supplementation with additional food/fluids is required, appropriate use of a bottle should be encouraged. Recommendations include:

- Feeding should be done under parental supervision.
- When the child has had enough, take the bottle away.
- Use cooled boiled water in a bottle if it is required to comfort the baby or if extra fluid is needed.
- From 6–8 months introduce the baby to a feeding cup. In most cases the bottle can be discarded by the age of 12 months.
- Children should be encouraged to drink water when they are thirsty. Water is a much better thirst quencher than fruit juice or sweetened drinks as these will not quench thirst, are acidic in nature and may reduce a child's appetite for nutritious foods.

Toothbrushing

- As soon as the first tooth appears, cleaning may begin. Using a piece of gauze or face washer, wrapped around a finger, wipe each tooth front and back. Continue this method of cleaning after each feed till the infant is approximately 12 months of age when a toothbrush (small head and soft bristles) can be introduced. Toothbrushing may be introduced sooner if accepted/tolerated by the infant.
- Once a child is able to spit out, toothpaste may be used.
- Current information supports the use of low fluoride toothpaste for children under seven. For children up to three years of age, use just a smear of toothpaste on the brush. For children older than three, use a pea size amount of low fluoride toothpaste.
- Children should be encouraged to spit toothpaste out and not swallow it.
- The recommended toothbrushing method is the simple sideway scrub (backwards and forwards). The brush should be placed at the junction where the gums and teeth meet.
- The chewing surfaces can be scrubbed. This is often the surface which is easiest for children to do on their own.
- Parents should brush the child's teeth or supervise brushing until they are sure the child can brush thoroughly.
- The most important aspect of toothbrushing is to develop a regular habit from an early age.

Dummies

Do not dip the dummy in any foods or liquids. Coating the dummy in substances such as honey may lead to extensive tooth decay and using liquids such as glycerine encourages the child to develop a sweet tooth.

Medicines

Many medicines contain a large percentage of sugar and are often given before the child goes to sleep. This can become a hazard for teeth if the child suffers from a chronic illness and is continually taking medicines. Ask your doctor to prescribe a sugar-free form, if available. The pharmacist may also be able to help.

Dental Checks

A dental examination should be carried out within six months of the eruption of the first tooth and no later than 12 months of age. This will help in early diagnosis and

prevention of dental disease. This is best done by a dentist, dental therapist or dental hygienist. Maternal and child health nurses and/or medical practitioners can identify the presence of infant feeding caries (dental caries), provide counselling to parents and refer them to the appropriate dental practitioner.

The Child Health Record recommends two mouth checks by the age of three and a half.

Encourage parent and child to have a regular dental check-up with a dental professional at least once every two years and more often if required. When discussing the first dental visit with the parents, the following information may be useful to include:

- Allow your child to accompany you when you visit the dentist. The dentist may have time to offer your child a ride in the chair.
- Make the dental appointment an accepted part of a regular routine.
- Make your child's appointment for early in the day so that your child is not tired.
- Arrive a little before time, to let your child become familiar with the new surroundings.
- Talk to your child about the dental visit in a positive way. Explain to your child that 'the dentist may give you a ride in the chair and count your teeth'.

Fluoride

Fluoride has been responsible for a marked improvement in the dental health of many Australians, particularly children.

Benefits of Fluoride

Seventy-five per cent of people in Victoria have direct access to fluoridated water (H&CS 1995). This means every time a glass of water is drunk, fluoride comes in contact with the teeth. The presence of fluoride in the mouth encourages the remineralisation of the tooth enamel in the early stages of attack and acts to make a more caries-resistant tooth by hardening tooth enamel. Fluoride also reduces the effect of the bacteria by interfering with their metabolism and therefore reducing the acid attack.

Where To Find Fluoride

Fluoride can be found in water supplies, either naturally or introduced. Some water supplies have naturally high levels of fluoride and this has to be reduced to stop the occurrence of brown mottling of teeth. Other areas have no natural fluoride and it is added to provide the maximum benefits to prevent tooth decay without the brown mottling. That level is between 0.3 and 1.0 part fluoride to every one million parts water.

Another source of fluoride is from toothpaste. In Australia, toothpaste must not have more than 1000 parts per million of fluoride. Toothpaste is not designed to be ingested but many young children eat or inadvertently swallow toothpaste. This is the reason for the introduction of low fluoride toothpaste for children under seven years of age.

Breastmilk contains very low levels of fluoride (<1 microgram/kg/day). However, many of the infant formulas on the market have high levels of fluoride and when constituted with fluoridated water are even higher (150–250 microgram/kg/day). In Australia there is a move by manufacturers to reduce the fluoride levels of their formulas and this move is supported by the dental profession.

Fluoride is available in the following forms:

- Naturally occurring in foods and drinks.
- Added to community water supply (fluoridation).
- Fluoride toothpastes, gels and mouth rinses.
- Fluoride gel painted on the teeth by a dental professional.
- Drops and tablets.

When Is a Fluoride Supplement Needed?

Fluoride tablets or drops (supplements) are needed for some children living in areas without fluoride in the community water supply and for those who are particularly at risk of dental caries (decay). **Supplements are not required** when living in an area with a fluoridated community water supply. Parents are advised to discuss the issue with a dental professional.

Fluoride supplements are not required during pregnancy, breastfeeding or bottle feeding.

Safety—Toxic Effects

Water fluoridation has recently been reviewed and is fully supported by the NHMRC. Fluoride levels are adjusted to a relatively low level of only one part fluoride or less to one million parts of water.

It is beneficial for children and adults to be exposed to water fluoridation. Where fluoride has been present in drinking water for longer than five years and then removed, a reversal of protective benefits has been observed over the same time, approximately five years, even though fluoride toothpastes have been available.

There is increasing evidence that older age groups in areas with water fluoridation are experiencing half the decay on root surfaces than similar people who live in non-fluoridated areas. Fluoride is available from toothpaste, tablets, topical gels and rinses. In fluoridated areas, the use of fluoridated water in manufacturing increases the fluoride levels in foods, especially dehydrated foods that have to be reconstituted with water, such as infant formulas. The minimum dose that could cause toxic signs and symptoms and could require therapeutic intervention and hospitalisation, is called **Probable Toxic Dose** and has been set at **5mg Fluoride/kg of body weight**. It is very important for young children not to receive large quantities of fluoride as their body mass is small, so that a Probable Toxic Dose is soon reached.

Further Information

For more information on any aspect of fluoride, contact the Dental Health Promotion Unit at Dental Health Services of Victoria on tel: (03) 9341 0413.

Checklist for Nurses—Mouth Checks

The Child Health Record is an invaluable guide to a child's health. It contains important, up-to-date information about the growth of children including food and nutrition and oral health from birth through to the teenage years. The following recommendations regarding mouth checks and oral health information also appear in the Record. Bring these to the parent's attention when discussing regular health checks and/or oral health.

Mouth Checks

(as recommended in the *Child Health Record*)

6–8 Month Health Check

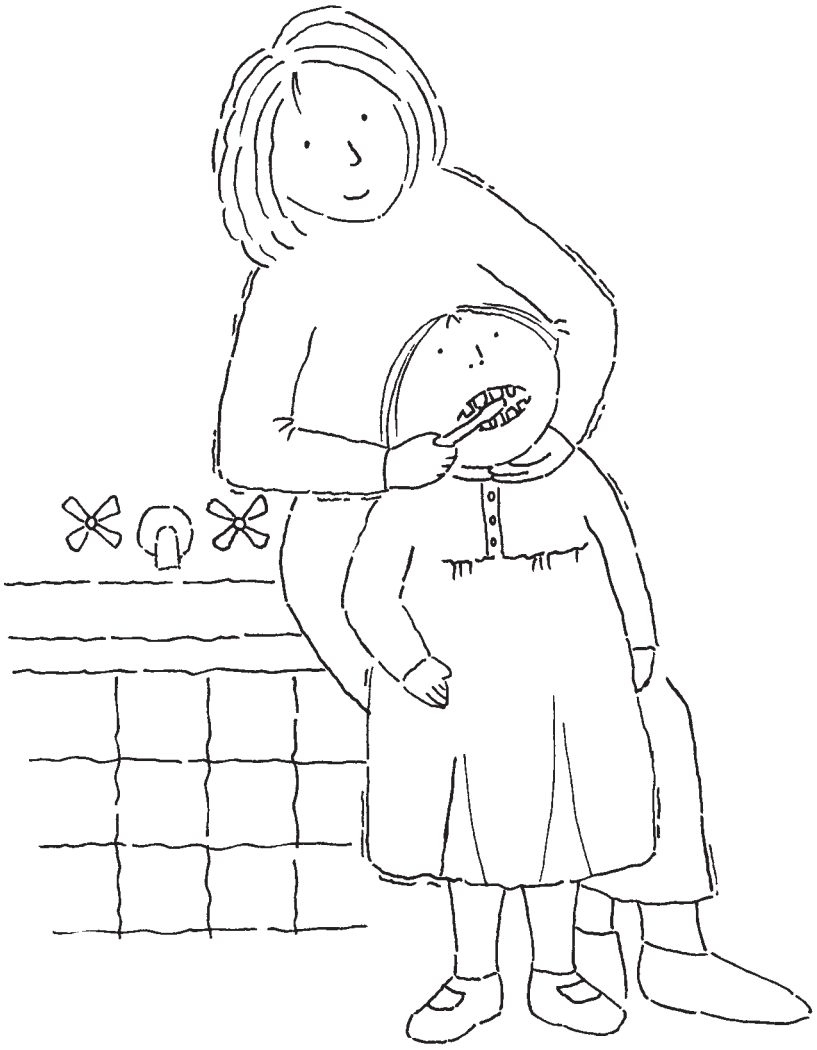
- Dental health information only.

18–21 Month Health Check

- Dental health information/toothbrushing.
- Examination of teeth and mouth.
- Dental visit.

3–3$^{1}/_{2}$ Years Health Check

- Dental heath information/toothbrushing.
- Examination of teeth and mouth.
- Dental visit.



Examination of Teeth

Place the child in a position that will allow a reasonable view of the mouth. The technique illustrated has been an effective way for parents and health professionals to view teeth.

What to look for:

1. Number of teeth—is number within the average range for age?

2. Colour of teeth—note any discolouration or stains, plaque, decay.

3. Any unusual lumps, sores, abscesses—does the oral cavity look healthy?

4. Is the child suffering from any dental pain?

Referrals

- To Dental Health Services Victoria, tel: 9341 0428
- To private dental practitioners, listed in yellow pages under ‘Dentists’. The Australian Dental Association (Vic Branch) can also provide names of dentists in your area, tel: 9826 8318.

Checklist for Nurses—Dental Health Information for Parents

6–8 Month Old Children

Teething

- Strategies for relieving the symptoms of teething
- Indicate eruption sequence.
- Recommend against using lemon juice on gums once any teeth are present. This can be harmful to new teeth as lemon juice is very acidic and can dissolve tooth enamel.

Solids

- Recommend that sugar, salt and fat are not added to solid foods. Follow the *Dietary Guidelines for Australians* (1992) and the *Dietary Guidelines for Children and Adolescents* (1995).

Feeding Patterns

- Stress importance of contents of bottle, consider acidity and sweetness.
- Encourage water as the preferred drink for thirst.
- Warn about using the bottle or breast as a comforter .
- Avoid prolonged periods with bottle in mouth, especially at night and during sleep.
- The key factor is frequency of sugar intake and the period of time that the teeth remain in contact with sweet or acidic foods and drinks.

Introducing the Cup

- Recommend introduction of cup from the age of 6–8 months.

Dummies

- Do not dip the dummy in any food stuffs or liquids.

Cleaning Teeth

- Start cleaning each day as soon as teeth erupt.
- Use a clean face washer or gauze as tolerated.

Fluoride

- Establish fluoride content of water supply in area where child lives. If supply has less than 0.3 ppm fluoride, then recommend that advice be given by the local dental professional regarding systemic fluoride supplements.

Infant Formulas

- Many infant formulas have high levels of fluoride. There is a move by manufacturers to reduce the fluoride levels in infant formulas.

18–21 Month Old Children

Feeding Patterns

- Warn about using the bottle or breast as a comforter.
- Stress importance of contents of bottle, consider acidity and sweetness.
- Encourage water as the preferred drink for thirst.
- Avoid prolonged periods with bottle in mouth especially at night and during sleep.
- The key factor is frequency of sugar intake and the period of time that the teeth remain in contact with sweet or acidic foods and drinks.

Nutritious Snacks and Drinks

- Encourage nutritious foods as snacks and drinks.

Bottle

- Encourage complete weaning of the bottle from 12 months of age.
- Introduce a cup from the age of 6–8 months.
- Encourage use of cup as the main drinking vessel from 12 months of age.

Dummies

- Do not dip the dummy in any food stuffs or liquids.
- Encourage complete weaning of dummy from 12 months of age.

Cleaning Teeth

- Encourage use of a small, soft toothbrush.

Fluoride

- Establish fluoride content of water supply in area where child lives. If supply has less than 0.3 ppm fluoride, then recommend that advice be given by the local dental professional regarding systemic fluoride supplements.

3–3$^{1}/_{2}$ Year Old Children

Cleaning Teeth

- Encourage use of a small, soft toothbrush. A smear of low fluoride toothpaste can be introduced as soon as the child can spit out.

Nutritious Snacks and Drinks

- Encourage nutritious foods as snacks and drinks.
- Encourage water as the preferred drink for thirst.

Bottle

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

Dummies

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

Thumb or Finger Sucking

- May cause orthodontic problems if it continues after the permanent front teeth erupt (about six to seven years).

Fluoride

- Establish fluoride content of water supply in area where child lives. If supply has less than 0.3 ppm fluoride, then recommend that advice be given by the local dental professional regarding systemic fluoride supplements.

Dental Visits

- Now is a good time to take the child along to a public dental service or private dentist.
- 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 the parent to ask questions relating to the child's development.

Tooth Care for School Age Children

Cleaning Teeth

- Encourage use of a small, soft toothbrush. A smear of low fluoride toothpaste can be introduced as soon as the child can spit out.

Nutritious Snacks and Drinks

- Encourage nutritious foods as snacks and drinks.

Dental Visits

- Make sure your child regularly attends a family dentist or school dental service. Ask them about the application of fissure sealants.

Remind your child to:

- Brush teeth after meals and floss daily.
- Use a child's fluoride toothpaste.
- Avoid sweet foods and drinks between meals.
- Drink water for thirst.

Dental Services in Victoria

Private Dental Services

Private dentists are listed in the yellow pages (under 'Dentists') in alphabetical order or by area. The Australian Dental Association (Vic Branch), tel: 9826 8318, can also provide names of dentists in your area.

Preschool Dental Services

There are ten preschool dental clinics operating in nine of Victoria's 78 municipalities. Eligibility for the Preschool Dental Clinic varies across municipalities. The maternal and child health nurses will need to investigate their local council before referring clients.

School Dental Services

(A division of Dental Health Services Victoria)

The objectives of the School Dental Service are to:

- Educate children, their parents and the community to achieve and maintain good oral health.
- Control existing dental disease in children.
- Prevent further dental disease.
- Promote a positive attitude towards seeking regular dental care.

The services of the School Dental Service are delivered by staff in nine regions. The regions are responsible for local planning and staff management with performance targets and staffing levels being set centrally.

The School Dental Service currently provides a 12 or 24 month program where children at schools are offered care every 24 months. High-risk children are recalled every 12 months by dental teams consisting of dentists, dental therapists and dental nurses. Care is provided from mobile dental vans, fixed clinics or dental centres.

Field dental therapists employed within the School Dental Service are trained to provide a range of dental care including examinations, scaling and cleaning, fissure sealants, x-rays, fillings, extractions, local anaesthesia, dental health promotion and the application of topical fluoride.

A dental officer visits the van or clinic on a regular basis to carry out treatment beyond the scope of the dental therapists. The dentist will discuss with parents if their child needs to consult a specialist.

In the School Dental Service, emphasis is placed on identifying and evaluating an individual child's potential risk for dental diseases and providing an individualised approach to care. Each child's treatment and preventive plan takes into account such factors as their age, home care practices, dental disease pattern, diet, motivation and fluoride experience. Health promotion and preventive care programs for individuals aim to create favourable attitudes and behaviours for continuation of care and to encourage greater responsibility for personal dental health.

Preventive care consists of:

- Methods of oral hygiene.
- Advice on diet.
- Fluoride therapy.
- Fissure sealants.

Further Information

Further information on the School Dental Service can be provided by Dental Health Services Victoria on tel: (03) 9341 0428.

Royal Dental Hospital Melbourne

(A Division of Dental Health Services Victoria)

The Royal Dental Hospital Melbourne, offers a range of general dental services and specialist services for eligible people. A small number of non-eligible people are admitted for teaching purposes.

There are waiting lists for most types of treatment, although patients who are in pain will be given emergency care without delay. An after hours emergency dental clinic operates at the Royal Dental Hospital Melbourne.

Community Dental Service

General dental care for eligible adults is now available at community dental clinics throughout metropolitan Melbourne and in all major country centres. There are subsidised patient fees and waiting lists for most types of treatment, although patients who are in pain will be given emergency care as soon as practicable.

To supplement the care provided at community dental clinics, the Pensioner Denture Scheme was introduced in 1981. Under this scheme, patients can receive dentures from private dentists or clinical dental technicians of their choice if they are prepared to pay a small portion of the fee.

Eligibility

Dental care at the Royal Dental Hospital of Melbourne or through the Community Dental Service is available to the holders of the following Commonwealth Department of Social Security Concession Cards:

- Pensioner Concession Card
- Health Care Card

Further information

Further information on any of the services provided by Dental Health Services Victoria can be obtained by contacting tel: (03) 9341 0428. As eligibility for these services varies, it is recommended that individual enquiries are made.

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