



The Royal Australasian
College of Physicians

The Royal Australasian College of Physicians Oral Health in Children and Young People Position Statement

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The RACP Paediatric and Child Health Policy Committee is responsible for this position statement

*The Royal Australasian College of Dental Surgeons supports this
position statement and its recommendations*

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1 Foreword

The Royal Australasian College of Physicians (RACP) believes that oral health is integrally linked to the overall health of children and young people.*

The importance of child oral health has been highlighted in the recent final report of Australia's National Advisory Council on Dental Health. The report states:

A good oral health foundation in childhood is the key determinant of oral health throughout life... Children are a priority because improvements to child oral health and prevention will reduce the overall burden of disease and improve long-term oral health across the population.¹

Addressing oral health in children and young people can significantly improve lifelong oral health which is a key determinant of health and wellbeing throughout the life of the individual.

Alongside this, RACP subscribes to the 4 key themes that underpin Australia's National Oral Health Plan (2004-2013), namely that:

1. Oral health is integral to general health;
2. Population health approaches are effective;
3. All Australians and New Zealanders should have access to appropriate and affordable services; and
4. Education is crucial, both to achieve an appropriately skilled workforce and to foster community behaviours that support good oral health.²

These themes are worthy of even greater emphasis in the context of paediatric oral health, as the impacts of poor dental health in childhood can be lifelong. Indeed we know there are significant inequalities with certain subpopulations in Australia and New Zealand experiencing poor paediatric oral health outcomes.

* Throughout the remainder of this document the term "child/children" will be understood to designate both children and young people.

2 Executive Summary

Oral health is an integral component of general health. Poor oral health has a significant functional impact on many other aspects of health, and can have long term consequences for a person's appearance and hence their self-esteem – which is particularly important for children and young people.

The impact of children and young people's oral health in Australia and New Zealand is significant:

- Dental caries, or tooth decay, is one of the most prevalent health problems in Australia;
- Paediatric oral health is one of the areas of greatest health inequity in Australia and New Zealand;
- Dental decay in early childhood is a significant predictor of long term dental health problems;
- Children across all socioeconomic backgrounds experience dental caries, but those from lower socioeconomic groups are less likely to receive timely treatment and therefore are more likely to experience longer term adverse effects;
- Effects of dental disease on physical appearance can lead to a loss of self-esteem, and restrictions on social and community participation;
- Children living in rural and regional areas are more likely to have tooth decay, have less frequent oral examinations and have fewer preventative treatments compared to children living in urban areas;
- Aboriginal and Torres Strait Islanders and Māori and Pacific peoples have significantly higher levels of tooth decay than the general population.

Dental caries is acknowledged to be highly preventable:

- The impact of prevention strategies such as fluoridation of water on reducing dental caries is now well established. In comparison to the cost of restorative dental treatment, community water fluoridation strategies result in substantial cost savings – something that is unique in public health disease-prevention strategies.
- Public health approaches to shifting community and individual behaviours is also a proven approach to addressing inequities in oral health.

There are significant opportunities to improve access to dental services:

- Very few infants see dentists specifically, so non-dental healthcare professionals (such as paediatricians) must be proactive in promoting good child oral health.
- Integrating awareness of oral health into training for paediatricians and other health practitioners who work with children is an important step that can improve early intervention and supports prevention strategies, particularly in vulnerable populations.
- Addressing geographic, financial and cultural barriers to accessing services is an opportunity to ameliorate the dental health impacts of disadvantage on children and young people.

3 Recommendations

The RACP recommends:

1. Supporting cost-effective public health measures that have a proven impact on child oral health, such as:
 - Public water fluoridation for all communities with populations greater than 1000 people;
 - Focusing on public water fluoridation for rural and remote communities, particularly in the Northern Territory and in Indigenous communities in Australia and New Zealand;
 - Minimising the use of bottled water for children in communities with adequate water fluoridation;
 - Supporting the establishment of oral health surveillance systems to provide an ongoing evidence base.
2. Addressing community and individual behaviours and public attitudes that have a proven link to paediatric oral health outcomes, such as:
 - Tooth brushing with fluoride toothpaste; and
 - Children's dietary habits, particularly around the consumption of sugary foods and drinks.
3. Increasing awareness among child health practitioners that dental health is a significant component of overall health by:
 - Including oral health as part of training for all health practitioners who work with children;
 - Collaborating with The Royal Australasian College of Dental Surgeons to conduct an education campaign targeting paediatricians, general practitioners and other child health practitioners.
4. Improving access to dental services for children, young people and pregnant women by:
 - Addressing financial and cultural barriers, for example by providing access to a universal dental scheme for children;
 - Ensuring all dental health professionals receive training in the skills required to manage children and adolescents as part of their professional training;
 - Supporting measures to increase the availability of dental services in rural and remote areas and to Indigenous children and young people in Australia and New Zealand.

The RACP supports the National Advisory Council on Dental Health's recent recommendation to implement a universal access scheme for all children and young people.

4 Introduction

Dental decay is the most common chronic childhood disease in Australia.³ The adverse effects of poor dental health can influence overall health and well-being.⁴ In children particularly, poor dental health has the potential to impact negatively a child's ability to eat, speak, sleep and socialise which may adversely affect them later in life.⁵ Experience of decay in early childhood predicts longer term dental health problems, so preventing the establishment of dental caries (decay) in the first instance is essential.

However particularly given that very few infants (under the age of two) access dental services, it is incumbent on the non-dental healthcare professions to be proactive in promoting good child oral health. As such physicians and paediatricians must become involved in addressing oral health issues in Australia and New Zealand.

This position statement intends to provide a synopsis of child and adolescent oral health issues within Australia and New Zealand. It provides suggested strategies for implementation by all members of the health workforce (including physicians, paediatricians, general practitioners, nurses and oral health practitioners), to ensure oral health becomes an integral component of any strategy to address general health for children and young people.

5 Dental Caries

Dental caries is an infectious disease caused by certain types of bacteria (cariogenic bacteria). They can live in the saliva and on the tissues of the mouth. These bacteria can colonise the tooth surface in the presence of dietary carbohydrates and produce acid which over time demineralises the tooth structure.

5.1 Epidemiology

Dental caries (decay) is one of the most prevalent health issues in Australia across all age groups⁶. In both Australia and New Zealand oral health varies among different population groups and areas of need, particularly in those areas that do not have access to a fluoridated water supply.^{7 8}

From the mid-1970s the dental health of New Zealand and Australian children improved considerably. This is thought to be accredited to fluoridated toothpaste and drinking water, improvements in dental hygiene and, in Australia, the School Dental Service.^{9 10} In recent years however this reduction in dental caries appears to have slowed or even reversed.¹¹ There has been an overall increase in child dental caries and the mean number of teeth affected by dental disease.¹² In addition the inequalities for children seem to have increased.¹³ Dental caries are prevalent across all socioeconomic groups,¹⁴ however children from the lowest socioeconomic groups have more teeth with disease, are more likely to have some or all of their primary teeth missing, and have poorer paediatric oral health outcomes than other groups.^{15 16} Although the reasons are not entirely clear, this unfavourable trend could be due to the changes in dietary consumption, decreases in the consumption of fluoridated water and modifications of the school dental programs available.

One of most recent surveys conducted by the Australian Institute of Health and Welfare (AIHW) showed that Australia has the equal eighth lowest percentage of decay experience among 12-year-olds.¹⁷ The oral health of 12 year olds in Australia is well documented with an average DMFT score (a measure of the number of decayed, missing or filled teeth) of 0.83. In addition, 63.3% have had no experience of dental caries. However across Australia, oral health appears to worsen as these children become young adults such that in the 15 to 24 age group over two thirds (64.2%) of young adults have experienced some dental caries with a mean DMFT score of 3.2. Untreated dental decay accounts for 25% of the disease experience in this age group. Furthermore, 18.5% of 15 to 24 year olds have at least one tooth missing due to dental disease. There are reported variations according to residential location with those living outside metropolitan areas suffering greater levels of dental caries than their counterparts of the same age in the cities.^{18 19}

AIHW's *A Picture of Australia's Children 2009* highlighted that over half of the children aged 6 to 12 years were decay-free in 2002 (53% and 58% respectively). Boys were more likely to be decay-free at age 12 than girls (60% compared with 56%), whereas proportions at age 6 were similar for both boys

and girls (52% and 53%, respectively).²⁰ However, this does not necessarily indicate that these children will remain decay free. Good dental care and visits to oral health practitioners are still necessary to allow children to reach adulthood with healthy mouths.

A survey conducted in 2009 found that one in two children in New Zealand were free of dental caries.²¹ However, this figure does not demonstrate the significant regional variation of tooth decay among children which is associated with both the differing water fluoridation status and ethnicity groups. The survey also found that Māori and Pacific children and adolescents had worse oral health outcomes overall, as did children and adolescents living in areas of higher socioeconomic deprivation.

In New Zealand the variance of paediatric oral health can be observed when the data is examined by region. 65% of 5-year-old children in Northland and Tairāwhiti suffer a DMFT of at least 1 and similarly 60% of children on the West Coast experience dental caries.²²

Preschool aged children in Australia have been shown to be at greater risk of experiencing dental decay compared to other groups in the community, with inequalities in oral health appearing as early as 2 years of age.^{23 24} If these problems are left untreated children can experience pain, infection and inflammation. Managing these problems may require hospitalisation, intravenous antibiotics and removing the teeth under anaesthesia. Here again inequalities exist with preschool aged children in rural areas being hospitalised far more often for dental disease than their metropolitan counterparts.²⁵ ²⁶ There is clear evidence that significant decay in the primary teeth leaves children at risk for decay in their adolescent years.

A 2003 survey revealed an increase in the number of hospitalisations for dental treatment for both children and adults between 1989 and 2003. This was quite pronounced in children less than 5 years of age, who experienced a 58% rise, while in children aged between 5 and 14 years, there was a rise of over 80%. Over the decade from 1993-94 to 2003-04 there has also been a threefold increase in the number of children requiring dental general anaesthetic care.²⁷ This is provided when standard dental treatment is not possible, and carries additional risks and resource requirements.

5.2 Impact of caries

5.2.1 Pain and sepsis

The potential sequelae to untreated decay are pain, infection and abscesses. Between 12% and 22% (one fifth) of 5 year old children report experience of toothache and of those who actually have caries up to 50% have had toothache.^{28 29} The prevalence of dental pain is known to be positively associated with caries experience which in turn is higher in the lower socio-economic populations. However the true level of discomfort felt by young children is hard to establish due to difficulties in reliability of parental and child report.

5.2.2 Economic costs

Dental caries is the second most costly diet-related disease in Australia, accounting for 10% of the total health expenditure in Australia in 2004-05 (behind cardiovascular disease at 11%). The economic impact of dental caries is considered comparable with that of diabetes and heart disease.³⁰ Dental services accounted for 7% of the total health expenditure behind hospital services (29%), out-of-hospital medical services (16%), and prescribed medications (11%).³¹ Approximately \$3.7 billion was spent on dental services in 2001-02, representing 5.2% of the total health expenditure.³²

The direct cost of acute hospitalisations such as mentioned above is estimated in excess of US\$3,300 per case which does not take in to account other costs to the family such as lost income, child care arrangements, travel, etc.³³ In a recent study the mean time between a child first reporting acute problems associated with a carious tooth to the completion of definitive emergency care under general anaesthesia is 15 days, also with a mean of over four attendances at other healthcare providers and two courses of antibiotics prior to the acute episode of care.³⁴ Such a pathway of care is obviously associated with significant additional hidden economic costs (distinguished from quality of life factors) to both family and healthcare system alike.

5.2.3 Impaired growth and nutrition

In addition to the acute experiences of dental pain, untreated caries can have broader impacts on general health and wellbeing. In 2000 the Surgeon General's Report on the Oral Health of America noted that painful symptoms can: "contribute to compromised ability to bite, chew and swallow foods; limitations in food selection and poor nutrition....pain, as a symptom of untreated dental and oral problems is a major source of diminished quality of life."³⁵ Dental pain may affect a child's ability or willingness to eat a nutritious and full diet and so may indirectly affect nutrition and growth. There is evidence that children with childhood caries are below an ideal body weight³⁶ and that some may well be anaemic and malnourished.³⁷ Comprehensive dental rehabilitation (restoration as well as extraction of carious primary teeth) under general anaesthesia is reportedly associated with improved eating, nutritional status and an increase in growth trajectory and improved quality of life.^{38 39}

5.2.4 Restricted activities

Up to one quarter of parents of 5 year olds report some form of negative impact resulting from their child's dental condition. Whilst pain is the most commonly reported impact, a proportion reported other sequelae including difficulties sleeping, eating, self-esteem and emotional disturbances.⁴⁰ For children, caries impacts on the ability to eat, speak, sleep and socialise, negatively affecting behaviour and development.⁴¹ Effects of dental disease on physical appearance can also lead to a loss of self-esteem and restrictions on social and community participation.⁴²

It has been estimated that in the US more than 51 million hours of school are lost per annum because of visits to dental services or dental problems.⁴³ Whilst preschool age children may not miss school because of dental problems, visits to the dentist and other spin offs from dental disease may have an impact on parent work hours and family function. Similarly it has been suggested that just under 10% of preschool children experience days of restricted activity resulting from their dental problems.

Whilst difficult to evaluate it has been suggested that the presence of dental pain itself is associated with poorer general and oral health which in turn may be associated with poorer school performance.^{44 45 46} The nature of these associations remain unclear.

5.2.5 Quality of Life.

Children with severe caries have a reduced quality of life.⁴⁷ When children experience dental problems and particularly when they are in pain and/or start to exhibit behavioural problems, parents also suffer feelings of guilt, worry or upset. Children with poor dental health may not sleep properly and may be considered as having difficult behaviour due to poor oral health. These factors all affect family life with parents not sleeping and losing income as a result of having to take time off work in order to take their children to receive dental care.

Furthermore there is a significant but moderate correlation between impact and the number of decayed teeth suggesting greater impacts with more extensive caries.^{48 49} Finally there is growing evidence that the effects of dental disease on physical appearance can lead to a loss of self-esteem and restrictions on social and community participation.^{50 51} As soon as the mouth is returned to health an improvement occurs across all these parameters.⁵²

5.2.6 Future caries.

There is strong evidence to support the fact that the best predictor of future caries activity is past dental caries experience.^{53 54 55} In one longitudinal cohort study of 2.5-3.5 year old children, 92% of those who had caries at the start of the study had new lesions at 12 months compared with only 29% of those that were caries free at the start.⁵⁶ Another study has found that adult oral health outcomes may be predicted to a significant extent by oral health in childhood.⁵⁷

5.3 Aetiology of caries

Dental caries is an infectious disease caused by cariogenic bacteria, which can live in the saliva and on the tissues of the mouth. Studies have shown that cariogenic bacteria can be transmitted from the primary care giver (usually the mother) to the infant even before teeth erupt in the baby's mouth. The earlier the colonisation occurs the greater the risk that the infant will develop early childhood caries (ECC). The colonisation is supported by the presence of a high carbohydrate environment.⁵⁸

Even in first few years of life, young children can develop ECC. ECC is associated with frequent consumption of sugary foods and drinks. It may also occur in children who are given pacifying bottles of juice, milk or formula, and soft drink or cordial to drink for prolonged periods during the day or overnight. It can be a devastating condition often requiring a hospital visit with general anaesthesia for treatment. This problem is further exacerbated, in some instances, by a 12-18 month waiting time for access to hospital beds and operating theatres in order to provide general anaesthesia to this young population.

5.3.1 Dental caries and breastfeeding

Controversy exists as to whether infant formulas or bovine milk in bottles and breast milk, given frequently to infants, contribute to the development of ECC. The evidence of a relationship between bottle use and caries risk is weak and it is likely that the risk of caries may be sensitive to the interaction of multiple factors including other (non-bottle) dietary practices.⁵⁹ This becomes important when children continue to breastfeed on demand beyond around one year of age, when their teeth may be exposed to food and liquids very frequently throughout the day and night.

Recent and methodologically reasonable studies have suggested that breastfeeding is not significantly associated with ECC.⁶⁰ Laboratory studies have noted that human breast milk does not appear to cause the drop in plaque pH required for the initiation and progress of dental decay and may in fact promote the deposition of calcium and phosphate ions on the tooth surface.⁶¹ It is likely that the addition of sweeteners to bottles and other dietary (non-bottle) practices may be more important than the use of infant formula or breast milk.

Breast feeding remains strongly recommended as the best option for mother and baby.

5.3.2 Other risk factors

In addition to the causal factors related to diet and oral hygiene, other risk factors may place children and young people at greater risk of dental caries. One key factor is the co-existence of developmental defects in either or both the primary and permanent dentitions of children and adolescents. These defects, which are variously described as 'hypoplastic' or 'hypomineralised', render affected teeth highly susceptible to the caries as well as post eruptive breakdown and hypersensitivity. The aetiology of these developmental defects is currently unclear but environmental influences including pre- and early post-natal infections, respiratory diseases, brain hypoxia and childhood illnesses have all been associated with these enamel defects.⁶²

Family poverty, deprivation and lower levels of education⁶³ are all factors that are known to increase the risk of caries. Children living in rural and remote areas or in low socio-economic status areas have significantly worse oral health than other children.⁶⁴ The section below on subpopulations explores in greater detail the risk factors associated with various subsections of the population.⁶⁵

5.4 Socio-environmental determinants of caries

There is a strong social gradient in oral health: the poorer you are, the worse your oral health:

- Government concession card holders are more than twice as likely to report poor or fair oral health (30%), compared to non-card holders (13%).⁶⁶
- Adult concession card holders have 1.4 times the tooth decay of non-cardholders.⁶⁷ Children in low socio-economic groups experience tooth decay at nearly twice the rate of those in high socio-economic groups.⁶⁸
- People living in the most disadvantaged areas are twice as likely to have complete tooth loss or inadequate natural dentition compared to people from high socio-economic areas.
- Adult oral health outcomes may be predicted by childhood socioeconomic status.⁶⁹

Dental caries, including untreated caries, are prevalent in children and young people across all socioeconomic groups. However the majority of child caries experience is concentrated in a minority of children who carry the greatest burden of disease. Research has shown that approximately 20% of four year olds and 20% of 15 year olds have approximately 90% of the total tooth decay for their age group.⁷⁰ However, children of low income families are at greater risk for poor dental health outcomes.⁷¹ Children without private health insurance are less likely than insured children to have annual dental

oral examinations.⁷² This places them at greater risk of poor dental health outcomes. They may also face financial barriers to receiving early treatment for dental caries.

Current data shows that children living in rural and remote areas or in low socio-economic status areas have significantly worse oral health than other children (twice as many dental caries on average for 6 year olds). Children and young people in out-of-home care have difficulty accessing specialist dental services despite initial assessments that show evidence of gross decay.⁷³

5.5 Dental caries in subpopulations of children and young people

5.5.1 Aboriginal and Torres Strait Islander and Māori and Pacific children

Aboriginal and Torres Strait Islanders and Māori and Pacific peoples have significantly higher levels of tooth decay than the general population.^{74 75} Overall Aboriginal children have twice the rate of caries than non-Indigenous children and experience a greater number of extractions.⁷⁶ Similarly, a higher proportion of Māori and Pacific Island children have a higher rate and severity of dental caries compared with other children in New Zealand. Research demonstrates that Māori children are three times more likely than non-Māori children to have experienced a high caries incident.⁷⁷ A recent study of urban adolescents in New Zealand found that significantly more Māori adolescents presented with decayed surfaces and caries compared to the overall group.⁷⁸

Improving Māori, Pacific, Aboriginal and Torres Strait Islander peoples' social and economic status will lead to health gains for both groups of people, including improved oral health. However changes at this level are the most challenging to effect, and difficult to measure and evaluate.⁷⁹ In recent years there have been significant commitments to addressing Indigenous health issues, for example the "Close the Gap"⁸⁰ campaign in Australia aims to improve Indigenous health outcomes in a range of areas. The Australian Dental Association endorses the Close the Gap Statement of Intent and proposes a range of measures to address the social and cultural determinants of Indigenous oral health. They note in particular that over 37% of the Indigenous population is under 15 years old, compared to 19% of non-Indigenous people, which means that addressing the oral health of children and young people is particularly important for the Indigenous population.⁸¹ This concurs with the Indigenous Dentists' Association of Australia, whose *Indigenous Oral Health Goals* include measures in the areas of public health and health promotion, as well as comprehensive and coordinated services that are culturally appropriate.⁸²

5.5.2 Children living in rural and remote areas

Children living in rural and remote communities face higher rates of dental disease compared to those that live in metropolitan regions. The statistics remain true even for children from higher socio-economic categories who experience greater DMFT than their metropolitan counterparts.⁸³

People living in rural areas experience poorer oral health outcomes than urban residents:

- In rural and regional areas people are more likely to have tooth decay, more likely to have no natural teeth, have less frequent dental oral examinations, and have fewer preventative treatments.⁸⁴
- Children in remote and very remote areas experience approximately 38% more decay than children in major cities.⁸⁵
- Six year olds living in rural and remote areas will on average have twice as many dental caries.⁸⁶
- Children 6 years and 12 years of age residing in regional/remote areas had 1.3 and 1.2 times as many DMFTs respectively compared with children in metropolitan areas.⁸⁷
- Adolescents in rural and remote areas are more likely to have extractions⁸⁸ and fillings than children in urban areas.

There are a range of factors that contribute to the poorer oral health outcomes of people in rural and remote areas, including:⁸⁹

- Greater socioeconomic disadvantage;
- Less exposure to fluoridated drinking water: even where town water is fluoridated, children living outside of town are unlikely to have access to this supply;
- Greater exposure to injury risks;

- Geographic isolation;
- Lower levels of access to health services. People in rural and remote areas have longer average wait times to see a private dentist (3.9 versus 1.6 weeks), and receive significantly less hours of dentistry compared to the rest of the population.⁹⁰

Access to dental services is a significant issue for people living in rural and regional areas due to:

- Lack of oral health care professionals and few, if any, specialists;
- Insufficient public sector dental infrastructure;
- Transport to attend dental services;
- Financial cost of services.

5.5.3 Children who have disabilities and/or chronic and complex needs

Children with disabilities face many difficulties in trying to maintain their oral health. They often present significant behavioural challenges, resulting in sleeping with bottles, poor diet, and other habits that may adversely impact dental health. They may also experience difficulties with chewing, swallowing and salivation which may have similar effects. Recognising and diagnosing dental problems can be difficult in this population as they may be unable to communicate accurately about pain.

Developmental dental defects are more common in children with special health care needs including those born prematurely or with very low birth weight and those who experienced significant systemic upset in the neonatal period. In addition children with clefts of the lip and palate and other craniofacial anomalies are more likely to have structurally compromised teeth which predispose to early onset caries. Early recognition of the presence of and increased risk posed by, these defects may be difficult in these children who often require complex inter-disciplinary care. Furthermore access to the appropriate specialist dental services may not be recognised as a priority alongside their other paediatric healthcare needs.

Some medications (particularly those used for behaviour management issues) may further affect salivation and periodontal tissues.⁹¹ Children with disabilities are also more likely to be taking antiepileptic medications that cause gum hypertrophy, and therefore have a greater need for specialised dental care. Sugar based syrups are another category of medication that can be problematic. Oral medicines containing sugar may increase the risk of dental caries if they are taken at night or at bedtime when the protective buffering and cleansing effects of saliva are reduced as the salivary flow rate falls.⁹²

Children with special healthcare needs (SHNs) may not experience more dental disease but have significantly more unmet treatment needs.⁹³ Access to services for children with SHNs can be problematic both in terms of appropriate facilities (wheelchair access, hoists etc) and the necessary specialist skills (medical and dental) required to manage this population. Access to regular dental care is important to eliminate a potential unrecognised cause of pain, sepsis and disturbed behaviour and it may involve access to a service with the provision to provide examination under anaesthetic. These challenges are further exacerbated in rural and regional areas.

Poor oral health, especially in children with chronic and complex needs, is a major cause of morbidity and can be a risk factor for severe, even life threatening complications. Children who are medically compromised (such as being immuno-compromised from disease and/or therapy) are at increased risk of developing systemic complications from dental infections, which may prove fatal.⁹⁴

6 Oral health promotion and caries prevention

Dental caries is highly preventable through individual and public health measures. Prevention of dental caries should focus on existing evidence based messages including:

- (a) Optimising exposure to fluoride from the earliest possible age through access to fluoridated water supplies and promoting tooth brushing with fluoridated toothpastes.
- (b) Promoting healthy eating habits that focus on general health (targeting optimal weight gain, etc.) but that include messages about reducing the frequency of sugary snacks and drinks to support good oral health.
- (c) Encouraging families to seek a 'dental home' (primary dental caregiver) for all children from a very young age in order to access appropriate anticipatory guidance.

6.1 Health promotion

All the evidence points to the need to include early exposure to fluoride at the core of any oral health promotion policy. This could be through public water fluoridation or early tooth brushing for all infants. It is recommended that children have their teeth brushed or wiped from the appearance of the first tooth around 7 months of age. Parents should be encouraged to continue to brush their children's teeth until they are about 6-7 years of age. This is when children develop the fine motor control to be able to write legibly. They are then able to remove dental plaque effectively themselves. Parents should also be encouraged to floss their children's teeth to remove plaque from between the teeth where the toothbrush cannot reach.

There is evidence that strategies to reduce the transmission of cariogenic bacteria from mother to child will reduce the caries experience of preschool aged children. For example, mothers can transmit bacteria to their children through various saliva-sharing activities such as cleaning a dummy in their own mouth or sharing utensils.

Potential prevention strategies include:

- maternal use of xylitol chewing gum or chlorhexidine digluconate mouthwash
- not sharing the child's utensils or toothbrushes
- not cleaning the baby's dummy with their own mouth
- caring for their own oral health
- oral health education for the parent or carer.

The evidence surrounding the relationship between maternal oral and general health and the oral health of the offspring is currently not strong. However there are many oral and general health benefits to be gained, especially by women in disadvantaged communities, from being exposed to oral health promotion. These benefits are likely to be optimised by adopting a broader 'determinants of health' approach and integrating oral health in to general health promotion. Opportunities for oral health promotion should be delivered in an integrated way within existing services already accessed by women from disadvantaged groups. The potential benefits of mothers improving their own oral health should be promoted in relation to general child health and wellbeing as well as the oral health outcomes for the individuals themselves and their broader communities.

Whilst attempts to target inappropriate infant feeding habits appears to have some influence on the knowledge base of parents, there is no evidence that this is transferred into behavioural change. However with increasing concerns regarding overweight and obesity, particularly in children and adolescents, messages concerning healthy eating in general should be consistent across the health spectrum.

6.2 Fluoridation

The impact of prevention strategies such as fluoridation of water on reducing dental caries is now well established. Fluoride may be delivered in two ways: systemically (by drinking water that has fluoride added) and topically (brushing with fluoride toothpaste). Adding fluoride to community water supplies has benefited over 210 million people throughout the world. Community water fluoridation programs have directly reduced the rate of dental caries in Canada, the USA, Chile, Colombia, Israel, Britain, Ireland, as well as Australia and New Zealand.⁹⁵

6.2.1 Efficacy

Fluoridation reduces the inequalities of oral health status and is effective in reducing dental decay in children.⁹⁶ In comparison to the cost of restorative dental treatment, community water fluoridation strategies result in substantial cost savings – something that is unique in public health disease-prevention strategies. For example a population based sample of 9 year old Auckland children found a strong relationship between fluoridation status and enamel defects and dental caries, with children who lived continuously in fluoridated areas being 4.2 times less likely to have enamel defects and dental caries than children who lived continuously in non-fluoridated areas.⁹⁷ **It is considered to be the most cost effective and safe method of preventing dental caries.**^{98 99}

In New Zealand, it is estimated that fluoridation of the water supply prevents between 58,000 and 267,000 DMFTs annually.¹⁰⁰ A 2004 study found that water fluoridation significantly reduced both the prevalence and severity of caries in 5 year olds and 12 year olds, with the differences even more pronounced in children from Māori and Pacific backgrounds and in low socio-economic groups, thus helping redress inequalities in oral health.¹⁰¹ More recently in New Zealand, children aged 2-17 were found to have on average 2.4 DMFT if they lived in non-fluoridated areas, compared to an average of 1.5 DMFT if they lived in fluoridated areas.¹⁰² In Australia, children aged 5-15 years with higher concentrations of fluoride in drinking water had less DMFTs on average than children residing in areas with comparatively lower concentrations of fluoride in the water supply. The statistics show that differences ranged from 6.9% to 65.3% in the deciduous teeth and 12.7 to 50.6% in permanent teeth.¹⁰³

Although the scientific community considers that the evidence regarding the efficacy and cost effectiveness of water fluoridation as a public health measure is strongly in favour of public water fluoridation, there remain some vocal lobby groups who oppose it. Water fluoridation has become a contentious issue in New Zealand with a vocal lobby group advocating against its use with community campaigns proliferating misleading information.¹⁰⁴ A National Fluoridation Information Service has now been established, which is a consortium of scientists who monitor and assess the ongoing research around the world to assess the effectiveness and safety of water fluoridation.¹⁰⁵

A key argument against fluoridation is that it is a form of mass medication without consent.¹⁰⁶ However there are other examples of essential elements added to items in the food chain for public health benefit such as iodine to salt and folate to bread. The ethical issues concerning fluoridation have been examined by the Nuffield Council on Bioethics in the UK who felt that water fluoridation should not be prohibited outright on the basis of the above argument. Rather it should be accepted on the basis of the risks and benefits, potential alternatives and the role of consent where there are potential harms. The council recommended that decisions should be made at a local or regional level.¹⁰⁷

There are also concerns expressed about the safety of fluoride. However, a systematic review to evaluate the scientific literature relating to the health effects of fluoride and fluoridation¹⁰⁸ commissioned by the Australian National Health and Medical Research Council came out firmly in favour of fluoridation as an effective intervention to achieve health benefits across the population. Fluoridation of water does not increase the likelihood of bone fractures or cancer.¹⁰⁹ Fluoridation of water can be associated with dental fluorosis (flecking of tooth enamel). However, this is usually graded as mild or less, affects the cosmetic appearance of the teeth and is not of clinical concern. As there is a dose dependant relationship between fluoride exposure and dental fluorosis avoiding excessive exposure is a suitable strategy particularly in infants aged 15 to 30 months.¹¹⁰

6.2.2 Access

While access to water fluoridation has increased across Australia, there are areas for improvement. In particular, rural and remote communities are less likely to have fluoridation, which places the community's children and young people at greater risk for poor dental health. Australia's *National Oral Health Plan*¹¹¹ outlines intentions to extend fluoridation of public water supplies to communities across Australia with population of 1000 or more, within two years of the commencement of the Plan. It is understood that the proportion of people in each State or Territory exposed to optimal fluoride drinking water supplies has increased from 70% in 2006 to 90% in 2010.¹¹² The state of Queensland has a water fluoridation plan that will result in 95% population coverage by the end of 2012, and currently has 92% population coverage.¹¹³

However, communities of less than 1000 will still benefit from water fluoridation as a matter of equity as these communities already experience lower socio-economic status and poor health.¹¹⁴ Notably, the Northern Territory has the lowest rate of water fluoridation in the country. Rural and remote areas of Australia and New Zealand are more likely to have non-fluoridated water supplies and there is evidence to suggest children in these regions are also more likely to have higher frequency of dental caries.¹¹⁵ The Australian Indigenous Health Association has set a target that all Indigenous communities with a population over 500 should have a fluoridated water supply by 2020.¹¹⁶

6.3 Early Intervention

The evidence shows that:

- (a) Early childhood caries (ECC) is the best predictor of caries later in life;
- (b) Once caries has progressed to cavitation it requires restoration (filling) which can be challenging and not altogether successful in young children;
- (c) The strong evidence of transmission of cariogenic bacteria from primary care giver to infant increases risk of caries;
- (d) Overlap between risk factors for overweight and obesity and dental caries associated with family, parenting and many other socio-demographic factors.
- (e) The presence of developmental dental defects is not only a risk factor for dental caries but also makes effective oral hygiene more difficult and increases the levels of anxiety experienced by children during dental treatment.
- (f) Keeping children generally healthy helps prevent dental caries.

Given these factors, all families should be able to access appropriate anticipatory guidance and preventive advice for their children from a very early age (if not during pregnancy). Given that most infants do not come into contact with the dental profession – rather their parents seek advice from a range of primary care providers – it is being increasingly recognised internationally that cross-disciplinary efforts are required to achieve a reduction in disease burden associated with childhood dental caries.

6.3.1 Managing early childhood caries

Managing early childhood caries (ECC), is difficult as it can require extensive restorative treatment and extractions. Since ECC can begin in a child's life as early as one year of age, access to appropriately trained dentists is essential to avoid the need for hospitalisation.¹¹⁷ Due to the age of the child and severity of disease, treatment often requires a hospital setting and general anaesthesia, which is costly and imposes significant emotional and psychosocial burdens on the child and family.¹¹⁸

6.3.2 Treatment settings

Clinical services for adolescents and young people need to be built around their developmental needs and to take account of the prevailing youth cultures. While many children may be able to access free or low cost dental services through schools, these are not uniformly available and are not necessarily distributed according to greatest need. In Australia a Commonwealth funded Australian Dental Scheme was established in 1973. States and Territories were responsible for delivering services. Changes in funding arrangements in the early 1980s resulted in lack of Commonwealth responsibility for the scheme. Currently only Western Australia, Queensland, South Australia and the Northern Territory provide a school based dental program.¹¹⁹ It should be noted that school based dental services do not always meet the needs of children with complex health problems, including disabilities.

Traditional and contemporary dental care settings are often viewed by young people as alienating. There is no clear transition from free or low cost and easily accessible dental services through schools to the prevailing adult service delivery models. The challenges of this transition may result in many adolescents and young adults adopting an inadequate pattern of dental attendance at a time when risk status is increased. This transition process requires the focus of government, professional groups and researchers.

6.4 Service access and workforce capacity

The RACP recognises there are opportunities to improve service access and the capacity of the medical workforce to address dental health issues in children and young people. Options will be developed during the broader consultation phase of this project, but may include integrating oral health into existing services by:

- Developing an oral health curriculum for medical students;¹²⁰
- Training primary care physicians and other child healthcare professionals to identify infants at risk of dental disease;¹²¹
- Increasing service access for Indigenous communities by implementing measures to support health professionals to provide culturally safe services for Indigenous people, and encouraging and supporting more Indigenous health professionals to undertake training in dental health;
- Developing evidence based clinical guidelines for paediatricians that address common risk factors; and
- Training paediatricians, general practitioners and other medical practitioners who work with children and young people to be aware of oral health as a significant determinant of overall health.

6.4.1 Universal Dental Schemes

Access to dental services would also be dramatically improved under the adoption of a universal dental scheme for children. Recently in Australia the National Advisory Council on Dental Health released its final report. This report strongly recommends implementing a universal dental scheme for children, on the grounds that dental caries are prevalent among all groups of children – not just those from low income families – and that the impact of poor dental health in children has significant long term consequences.

7 Further reading

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HealthInsite: Dental Health for Children
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