

# Guideline on Infant Oral Health Care

## Originating Committee

Clinical Affairs Committee – Infant Oral Health Subcommittee

## Review Council

Council on Clinical Affairs

## Adopted

1986

## Revised

1989, 1994, 2001, 2004, 2009

## Purpose

The American Academy of Pediatric Dentistry (AAPD) recognizes that infant oral health, along with perinatal oral health, is one of the foundations upon which preventive education and dental care must be built to enhance the opportunity for a lifetime free from preventable oral disease. Recognizing that allied health professionals and community organizations must be involved as partners to achieve this goal, the AAPD proposes recommendations for preventive strategies, oral health risk assessment, anticipatory guidance, and appropriate therapeutic interventions to be followed by the stakeholders in pediatric oral health.

## Methods

This revision included a new systematic literature search of the MEDLINE/Pubmed electronic database using the following parameters: Terms: infant oral health, infant oral health care, and early childhood caries; Field: all fields; Limits: within the last 10 years, humans, English, and clinical trials. Papers for review were chosen from the resultant list and from references within selected articles. When data did not appear sufficient or were inconclusive, recommendations were based upon expert and/or consensus opinion by experienced researchers and clinicians.

## Background

### Introduction

The Centers for Disease Control and Prevention reports that caries is perhaps the most prevalent infectious disease in our nation's children.<sup>1</sup> More than 40% of children have caries by the time they reach kindergarten.<sup>2</sup> Early childhood caries (ECC) can be a particularly virulent form of caries, beginning soon after tooth eruption, developing on smooth surfaces, progressing rapidly, and having a lasting detrimental impact on the dentition.<sup>3-8</sup> This disease affects the general population but is 32 times more likely to occur in infants who are of low socioeconomic status, who consume a diet high in sugar, and whose mothers have a low education level.<sup>9</sup> Caries in primary teeth can affect children's growth, result in significant pain and potentially life-threatening infection, and diminish overall quality

of life.<sup>10-17</sup> Since physicians, nurses, and other health care professionals are far more likely to see new mothers and infants than are dentists, it is essential that they be aware of the infectious etiology and associated risk factors of ECC, make appropriate decisions regarding timely and effective intervention, and facilitate the establishment of the dental home.<sup>3,18-21</sup>

### Caries

Caries results from an overgrowth of specific organisms that are part of normally-occurring human oral flora.<sup>22</sup> Mutans streptococci (MS) is considered to be a principal indicator group of bacterial organisms responsible for dental caries.<sup>23</sup> MS colonization of an infant has been shown to occur from the time of birth.<sup>24-30</sup> While colonization had been thought to occur after dental eruption (as teeth provided non-shedding surfaces for adherence), current data show that other surfaces also may harbor MS.<sup>28,31,32</sup> For example, the furrows of the tongue appear to be an important ecological niche in harboring the bacteria in pre-dentate infants.<sup>29,31</sup>

Vertical colonization of MS from mother to infant is well documented;<sup>33-35</sup> genotypes of MS in infants appear identical to those present in mothers in approximately 71% of mother-infant pairs.<sup>36</sup> The higher the levels of maternal salivary MS, the greater the risk of the infant being colonized.<sup>37</sup> Along with salivary levels of MS, mother's oral hygiene, periodontal disease, snack frequency, and socioeconomic status also are associated with infant colonization.<sup>32</sup> Recent reports have indicated that horizontal transmission (ie, transmission between members of a group) also may be of concern.<sup>38-40</sup> Horizontal sources may include siblings of similar age or children in a daycare center.

### Preventive strategies

Caries is a disease that is, by and large, preventable. Early risk assessment allows for identification of parent-infant groups who are at risk for ECC and would benefit from early preventive intervention. The ultimate goal of early assessment is the timely delivery of educational information to populations at high risk for developing caries in order to prevent the need for later surgical intervention.

### Oral health risk assessment

An oral health risk assessment for infants by 6 months of age allows for the institution of appropriate preventive strategies as the primary dentition begins to erupt. Caries risk assessment can be used to determine the patient's relative risk for caries. Even the most judiciously designed and implemented caries-risk assessment tool, however, can fail to identify all infants at risk for developing ECC. In these cases, the mother may not be the colonization source of the child's oral flora, the dietary intake of simple carbohydrates may be extremely high, or other uncontrollable factors may combine to place the patient at risk for developing caries. Therefore, screening for risk of caries in the parent and patient coupled with oral health counseling, although a feasible and equitable approach to ECC control, is not a substitute for the early establishment of the dental home.<sup>37</sup> Whenever possible, the ideal approach to infant oral health care, including ECC prevention and management, is the early establishment of a dental home.<sup>21,41</sup>

### Anticipatory guidance<sup>42</sup>

General anticipatory guidance for the mother (or other intimate caregiver) includes the following:

- Oral hygiene: Tooth-brushing and flossing by the mother on a daily basis are important to help dislodge food and reduce bacterial plaque levels.
- Diet: Important components of dietary education for the parents include the cariogenicity of certain foods and beverages, role of frequency of consumption of these substances, and the demineralization/remineralization process.
- Fluoride: Using a fluoridated toothpaste approved by the American Dental Association and rinsing every night with an alcohol-free, over-the-counter mouth rinse containing 0.05% sodium fluoride have been suggested to help reduce plaque levels and help enamel remineralization.<sup>18</sup>
- Caries removal: Routine professional dental care for the mothers can help keep their oral health in optimal condition. Removal of active caries with subsequent restoration is important to suppress maternal MS reservoirs and has the potential to minimize the transfer of MS to the infant, thereby decreasing the infant's risk of developing ECC.<sup>46</sup>
- Delay of colonization: Education of the parents, especially mothers, on avoiding saliva-sharing behaviors (eg, sharing spoons and other utensils, sharing cups, cleaning a dropped pacifier or toy with their mouth) can help prevent early colonization of MS in their infants.
- Xylitol chewing gums: Evidence demonstrates that mothers' use of xylitol chewing gum can prevent dental caries in their children by prohibiting the transmission of MS.<sup>47</sup>

General anticipatory guidance for the young patient (0 to 3 years of age) includes the following:

- Oral hygiene: Oral hygiene measures should be implemented no later than the time of the eruption of the first primary tooth. Cleansing the infant's teeth as soon as they erupt with either a washcloth or soft toothbrush will help

reduce bacterial colonization. Children's teeth should be brushed twice daily with fluoridated toothpaste and a soft, age-appropriate sized toothbrush.<sup>37</sup> A "smear" of toothpaste is recommended for children less than 2 years of age,<sup>48</sup> while a "pea-size" amount of paste is recommended for children 2-5 years of age.<sup>48-50</sup> Flossing should be initiated when adjacent tooth surfaces can not be cleansed with a toothbrush.<sup>37</sup>

- Diet: High-risk dietary practices appear to be established early, probably by 12 months of age, and are maintained throughout early childhood.<sup>51,52</sup> Frequent night time bottle feeding, ad libitum breast-feeding, and extended and repeated use of a sippy or no-spill cup are associated with, but not consistently implicated in ECC.<sup>53</sup> Likewise, frequent consumption of snacks or drinks containing fermentable carbohydrates (eg, juice, milk, formula, soda) also can increase the child's caries risk.<sup>54</sup>
- Fluoride: Optimal exposure to fluoride is important to all dentate infants and children. The use of fluoride for the prevention and control of caries is documented to be both safe and effective.<sup>55-59</sup> Twice-daily brushing with fluoridated toothpaste is recommended for all children as a preventive procedure.<sup>55,60</sup> Professionally-applied fluoride, as well as at-home fluoride treatments, should be considered for children at high caries risk based upon caries risk assessment.<sup>55,58,59,61,62</sup> Systemically-administered fluoride should be considered for all children drinking fluoride deficient water (<0.6 ppm).<sup>63</sup> Caution is indicated in the use of all fluoride-containing products. Fluorosis has been associated with cumulative fluoride intake during enamel development, with the severity dependent on the dose, duration, and timing of intake.<sup>58</sup> Decisions concerning the administration of additional fluoride are based on the unique needs of each patient.<sup>43-45</sup>
- Injury prevention: Practitioners should provide age-appropriate injury prevention counseling for orofacial trauma. Initially, discussions would include play objects, pacifiers, car seats, and electric cords.<sup>64</sup>
- Non-nutritive habits: Non-nutritive oral habits (eg, digit or pacifier sucking, bruxism, abnormal tongue thrust) may apply forces to teeth and dentoalveolar structures. It is important to discuss the need for early sucking and the need to wean infants from these habits before malocclusion or skeletal dysplasias occur.<sup>64</sup>

### Recommendations

The AAPD recommends that:

1. All primary health care professionals who serve mothers and infants provide parent/caregiver education on the etiology and prevention of ECC. Oral health counseling and referral for a comprehensive oral examination and treatment during pregnancy is especially important for the mother.
2. The infectious and transmissible nature of bacteria that cause ECC and methods of oral health risk assessment,

anticipatory guidance, and early intervention be included in the curriculum of all medical, nursing, and allied health professional programs.

3. Every infant receive an oral health risk assessment from his/her primary health care provider or qualified health care professional by 6 months of age. This initial visit should consist of the following:
  - assessing the patient's risk of developing oral disease using a caries risk assessment;
  - providing education on infant oral health; and
  - evaluating and optimizing fluoride exposure.
4. Parents or caregivers establish a dental home for infants by 12 months of age. The following should be accomplished at that visit:
  - recording thorough medical (infant) and dental (mother or primary caregiver and infant) histories;
  - completing a thorough oral examination;
  - assessing the infant's risk of developing caries and determining an appropriate prevention plan and interval for periodic reevaluation based upon that assessment;
  - providing anticipatory guidance regarding dental and oral development, fluoride status, non-nutritive sucking habits, teething, injury prevention, oral hygiene instruction, and the effects of diet on the dentition;
  - planning for comprehensive care in accordance with accepted guidelines and periodicity schedules for pediatric oral health;
  - referring patients to the appropriate health professional if intervention is necessary.
5. Health care professionals and all other stakeholders in children's oral health should support the identification of a dental home for all infants at 12 months of age.
6. Legislators, policy makers, and third party payors be educated about the benefits of early interventions in order to support efforts that improve access to oral health care for infants and children.

## References

1. US Dept of Health and Human Services. Oral health in America: A report of the Surgeon General. Rockville, Md: US Dept of Health and Human Services, National Institute of Dental and Craniofacial Research, National Institutes of Health; 2000.
2. Pierce KM, Rozier RG, Vann WF Jr. Accuracy of pediatric primary care providers' screening and referral for early childhood caries. *Pediatrics* 2002;109(5):E82-2.
3. Nowak AJ, Warren JJ. Infant oral health and oral habits. *Pediatr Clin North Am* 2000;47(5):1043-66.
4. Gray MM, Marchment MD, Anderson RJ. The relationship between caries experience in deciduous molars at 5 years and in first permanent molars of the same child at 7 years. *Community Dent Health* 1991;8(1):3-7.
5. Grindefjord M, Dahllöf G, Modéer T. Caries development in children from 2.5 to 3.5 years of age: A longitudinal study. *Caries Res* 1995;29(6):449-54.
6. O'Sullivan DM, Tinanoff N. The association of early dental caries patterns with caries incidence in preschool children. *J Public Health Dent* 1996;56(2):81-3.
7. Johnsen DC, Gerstenmaier JH, DiSantis TA, Berkowitz RJ. Susceptibility of nursing-carries children to future approximal molar decay. *Pediatr Dent* 1997;19(1):37-41.
8. Heller KE, Eklund SA, Pittman J, Ismail AA. Associations between dental treatment in the primary and permanent dentitions using insurance claims data. *Pediatr Dent* 2000;22(6):469-74.
9. Drury TF, Horowitz AM, Ismail AA, et al. Diagnosing and reporting early childhood caries for research purposes. *J Public Health Dent* 1999;59(3):192-7.
10. Acs G, Lodolini G, Kaminsky S, Cisneros GJ. Effect of nursing caries on body weight in a pediatric population. *Pediatr Dent* 1992;14(5):302-5.
11. Ayhan H, Suskan E, Yildirim S. The effect of nursing or rampant caries on height, body weight, and head circumference. *J Clin Pediatr Dent* 1996;20(3):209-12.
12. Fleming P, Gregg TA, Saunders ID. Analysis of an emergency dental service provided at a children's hospital. *Int J Paediatr Dent* 1991;1(1):25-30.
13. Schwartz S. A one-year statistical analysis of dental emergencies in a pediatric hospital. *J Can Dent Assoc* 1994;60(11):959-62, 966-8.
14. Sheller B, Williams BJ, Lombardi SM. Diagnosis and treatment of dental caries-related emergencies in a children's hospital. *Pediatr Dent* 1997;19(8):470-5.
15. Low W, Tan S, Schwartz S. The effect of severe caries on the quality of life in young children. *Pediatr Dent* 1999;21(6):325-6.
16. Acs G, Pretzer S, Foley M, Ng MW. Perceived outcomes and parental satisfaction following dental rehabilitation under general anesthesia. *Pediatr Dent* 2001;23(5):419-23.
17. Thomas CW, Primosch RE. Changes in incremental weight and well-being of children with rampant caries following complete dental rehabilitation. *Pediatr Dent* 2002;24(2):109-13.
18. American Academy of Pediatrics. Policy on oral health risk assessment timing and establishment of the dental home. *Pediatrics* 2003;111(5Pt1):1113-6.
19. Lewis CW, Grossman DC, Domoto PK, et al. The role of the pediatrician in the oral health of children: A national survey. *Pediatrics* 2000;106(6):E84.
20. Harrison R. Oral health promotion for high-risk children: Case studies from British Columbia. *J Can Dent Assoc* 2003;69(5):292-6.
21. American Academy of Pediatrics, Section on Pediatric Dentistry and Oral Health. A policy statement: Preventive intervention for pediatricians. *Pediatrics* 2008;122(6):1387-94.

22. Loesche WJ. Clinical and microbiological aspects of chemotherapeutic agents used according to the specific plaque hypothesis. *J Dent Res* 1979;58(12):2404-12.
23. Ge Y, Caufield PW, Fisch GS, Li Y. *Streptococcus mutans* and *Streptococcus sanguis* colonization correlated with caries experience in children. *Caries Res* 2008;42(6):444-8. Epub 2008 Oct 3.
24. Berkowitz RJ, Jordan HV, White G. The early establishment of *Streptococcus mutans* in the mouths of infants. *Arch Oral Biol* 1975;20(3):171-4.
25. Stiles HM, Meyers R, Brunelle JA, Wittig AB. Occurrence of *Streptococcus mutans* and *Streptococcus sanguis* in the oral cavity and feces of young children. In: Stiles M, Loesch WJ, O'Brien T, eds. *Microbial Aspects of Dental Caries*. Washington, DC: Information Retrieval; 1976:187.
26. Loesche WJ. Microbial adhesion and plaque. In: *Dental Caries: A Treatable Infection*. 2<sup>nd</sup> ed. Grand Haven, Mich: Automated Diagnostic Documentation, Inc; 1993:81-116.
27. Wan AK, Seow WK, Purdie DM, Bird PS, Walsh LJ, Tudehope DI. A longitudinal study of *Streptococcus mutans* colonization in infants after tooth eruption. *J Dent Res* 2003;82(7):504-8.
28. Wan AK, Seow WK, Walsh LJ, Bird P, Tudehope DI, Purdie DM. Association of *Streptococcus mutans* infection and oral developmental nodules in predecidate infants. *J Dent Res* 2001;80(10):1945-8.
29. Berkowitz RJ. Mutans streptococci: Acquisition and transmission. *Pediatr Dent* 2006;28(2):106-9, discussion 192-8.
30. Law V, Seow WK, Townsend G. Factors influencing oral colonization of mutans streptococci in young children. *Aust Dent J* 2007;52(2):93-100, quiz 159.
31. Tanner ACR, Milgrom PK, Kent R Jr, et al. The microbiota of young children from tooth and tongue samples. *J Dent Res* 2002;81(1):53-7.
32. Wan AK, Seow WK, Purdie DM, Bird PS, Walsh LJ, Tudehope DI. Oral colonization of *Streptococcus mutans* in six-month-old predecidate infants. *J Dent Res* 2001;80(12):2060-5.
33. Davey AL, Rogers AH. Multiple types of the bacterium *Streptococcus mutans* in the human mouth and their intra-family transmission. *Arch Oral Biol* 1984;29(6):453-60.
34. Berkowitz R, Jones P. Mouth-to-mouth transmission of the bacterium *Streptococcus mutans* between mother and child. *Arch Oral Biol* 1985;30(4):377-9.
35. Douglass JM, Li Y, Tinanoff N. Association of Mutans streptococci between caregivers and their children. *Pediatr Dent* 2008;29(5):375-87.
36. Li Y, Caufield PW. The fidelity of initial acquisition of Mutans streptococci by infants from their mothers. *J Dent Res* 1995;74(2):681-5.
37. American Academy of Pediatric Dentistry. Policy on early childhood caries (ECC): Classifications, consequences, and preventive strategies. *Pediatr Dent* 2008;30(suppl):40-2.
38. Mattos-Graner RO, Li Y, Caufield PW, Duncan M, Smith DJ. Genotypic diversity of Mutans streptococci in Brazilian nursery children suggests horizontal transmission. *J Clin Microbiol* 2001;39(6):2313-6.
39. Van Loveren C, Bujis JE, ten Cate JM. Similarity of bacteriocin activity profiles of Mutans streptococci within the family when the children acquire strains after the age of 5. *Caries Res* 2000;34(6):481-5.
40. Emanuelsson L, Wang X. Demonstration of identical strains of Mutans streptococci within Chinese families by genotyping. *Eur J Oral Sci* 1998;106(3):778-94.
41. American Academy of Pediatric Dentistry. Policy on the dental home. *Pediatr Dent* 2008;30(suppl):22-3.
42. Nowak AJ, Casamassimo PS. Using anticipatory guidance to provide early dental intervention. *J Am Dent Assoc* 1995;126(8):1156-63.
43. American Academy of Pediatric Dentistry. Policy on use of fluoride. *Pediatr Dent* 2008;30(suppl):34-5.
44. Hale K, Heller K. Fluorides: Getting the benefits, avoiding the risks. *Contemp Pediatr* 2000;2:121.
45. American Dental Association. Caries diagnosis and risk assessment: A review of preventive strategies and management. *J Am Dent Assoc* 1995;126(suppl):1S-24S.
46. New York State Department of Health. Oral health care during pregnancy and early childhood: Practice Guidelines. Aug, 2006. Available at: "<http://www.health.state.ny.us/publications/0824.pdf>". Accessed December 29, 2008.
47. Isokangas P, Söderling E, Pienihäkkinen K, Alanen P. Occurrence of dental decay in children after maternal consumption of xylitol chewing gum: A follow-up from 0 to 5 years of age. *J Dent Res* 2000;79(11):1885-9.
48. Scottish Intercollegiate Guideline Network. Prevention and management of dental decay in the pre-school child. A national guideline # 83. November, 2005. Available at: "<http://www.sign.ac.uk/pdf/qrg83.pdf>". Accessed March 6, 2009.
49. Pang DT, Vann WF Jr. The use of fluoride-containing toothpastes in young children: The scientific evidence for recommending a small amount. *Pediatr Dent* 1992;14(6):384-7.
50. Ramos-Gomes FJ, Crall JJ, Gansky SA, Slayton, RL, Featherstone JD. Caries risk assessment appropriate for the age 1 visit (infants and toddlers). *J Calif Dent Assoc* 2007;35(10):687-702.
51. Douglass JM. Response to Tinanoff and Palmer: Dietary determinants of dental caries and dietary recommendations for pre-school children. *J Public Health Dent* 2000;60(3):207-9.
52. Kranz S, Smiciklas-Wright H, Francis LA. Diet quality, added sugar, and dietary fiber intake in American pre-schoolers. *Pediatr Dent* 2006;28(2):164-71.
53. Reisine S, Douglass JM. Psychosocial and behavioral issues in early childhood caries. *Commun Dent Oral Epidem* 1998;26(suppl):32-44.

54. Marino R, Bonze K, Scholl T, Anhalt H. Nursing bottle caries: Characteristics of children at risk. *Clin Pediatr* 1989;28(3):129-31.
55. Adair SM. Evidence-based use of fluoride in contemporary pediatric dental practice. *Pediatr Dent* 2006;28(2):133-42.
56. Whitford GM. The physiological and toxicological characteristics of fluoride. *J Dent Res* 1990;69(special issue):539-49, discussion 556-7.
57. Workshop Reports I, II, III from "A symposium on changing patterns of fluoride intake" held at UNC\_Chapel Hill, April 23-25, 1991. *J Dent Res* 1992;71(5):1214-27.
58. CDC. Recommendations for using fluoride to prevent and control dental caries in the United States. *MMWR Recomm Rep* 2001;50(RR-14):1-42.
59. Facts about fluoride. *CDS Rev* 2006;99(1):44.
60. Featherstone JDB. Caries prevention and reversal based on caries balance. *Pediatr Dent* 2006;28(2):90-2.
61. American Dental Association, Council on Scientific Affairs. Professionally-applied topical fluoride: Evidence-based clinical recommendations. *J Amer Dent Assoc* 2006;137(8):1151-9.
62. American Academy of Pediatric Dentistry. Policy on use of a caries risk assessment tool (CAT) for infants, children, and adolescents. *Pediatr Dent* 2008;30(suppl):29-33.
63. American Academy of Pediatric Dentistry. Guideline on fluoride therapy. *Pediatr Dent* 2008;30(suppl):121-4.
64. American Academy of Pediatric Dentistry. Guideline on periodicity of examination, preventive dental services, anticipatory guidance, and oral treatment for children. *Pediatr Dent* 2009;31(special issue):118-25.