

# Review Article

## Infant Oral Health: A Literature Review

**Shreya Kapoor, Vivek Rana, Nikhil Srivastava, Noopur Kaushik, Tushar Pruthi**

Department of Pediatric & Preventive Dentistry, Subharti Dental College & Hospital, Swami Vivekanand Subharti University, SVSU, Meerut (Uttar Pradesh)

### ABSTRACT:

The American Academy of Pediatric Dentistry and the American Academy of Pediatrics advise that children undergo dental examinations and assessments within their first year of life. Early dental visits evaluate a child's risk status through parental interviews and oral examinations. Infant oral health plays a crucial role in a child's overall development. This article offers a concise overview of different aspects of oral health care for children, highlighting perinatal oral health care, anticipatory guidance, the concept of a dental home, the first dental visit, oral health examinations, dietary counseling, and therapeutic interventions for relevant oral issues, including teething. It serves as the foundation for lifelong preventive education and dental care, aimed at achieving optimal oral health throughout childhood.

**KEYWORDS:** Infant oral health, Infant, Oral health examination

**Address for correspondence :** Dr Shreya Kapoor, Post Graduate Student, Department of Pediatric & Preventive Dentistry, Subharti Dental College & Hospital, Swami Vivekanand Subharti University, SVSU, Meerut-250005 (Uttar Pradesh)  
Email Address: [kapoorshreya175@gmail.com](mailto:kapoorshreya175@gmail.com), **Submitted:** 08.06.2024, **Accepted:** 02.10.2024, **Published:** 30.10.2024

### INTRODUCTION:

Child development from conception to the age of one year is the most dynamic phase in terms of growth and development. Based on different age groups, humans are categorized into various stages and terms: from birth to 1 month is a neonate, 1 month to 1 year is an infant, 1 to 3 years is a toddler, and 3 to 6 years is a pre-schooler. The American Academy of Pediatric Dentistry (AAPD) emphasizes the significance of oral health in infants, viewing it as the foundation for building preventive education and dental care, to maximize the chances of a lifetime free from preventable oral diseases.<sup>[1]</sup> Traditionally, dental care in children has mainly aimed at preventing the development and progression of caries, premature loss of primary teeth, loss of dental arch length, and the formation of anxiety associated with dental visits. The role of a pediatric dentist is to guide both the child and the parent, addressing oral issues before they impact overall health and dental alignment.<sup>[2]</sup> To achieve and

sustain these goals, it is crucial for the dentist to conduct the initial oral examination during infancy, in consultation with the child's parent. In this regard, pediatric dentists hold a special responsibility toward children, their parents, and society as a whole. Hence, the preventive process should begin early in infancy to ensure a successful outcome.

### GOALS OF INFANT ORAL HEALTH CARE:

1. To identify, intercept, and adjust potentially harmful parenting practices that could negatively impact an infant's oral health.
2. Parent education right from the prenatal period
3. Parent/caregiver orientation to perceive dental services as an integral part of infant's overall health program
4. Periodic evaluation of the oro-facial development and oral health by the clinician
5. To break the cycle of early childhood caries
6. To manage the risk/benefits of oral habits

### Access this article online

Quick Response Code:



Website:

[www.pjsr.org](http://www.pjsr.org)

DOI:

<https://doi.org/10.5281/zenodo.14011420>

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-Non Commercial ShareALike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

**For reprints contact:** [editor.pjsr@peoplesuniversity.edu.in](mailto:editor.pjsr@peoplesuniversity.edu.in)

**How to cite this article:** Kapoor S, Rana V, Srivastava N, Kaushik N, Pruthi T. Infant Oral Health: A Literature Review. PJSR:2024;17(2):19-23.

7. Impart optimal fluoride protection
8. Use anticipatory guidance to arm parents in therapeutic alliance

Perinatal oral health care, dental home concept, first dental visit, oral health examination, food counselling, and therapeutic interventions for pertinent oral findings such as teething are all included in infant oral health care.<sup>[1]</sup>

### **PERINATAL ORAL HEALTH CARE:**

Both the mother's and the child's oral health are impacted by the mother's overall health. Preventing dental diseases may start with educating expectant mothers about their oral health, the effects of untreated dental conditions such as gingivitis and caries, and how these conditions will affect their unborn children. The 'perinatal period' is the time starting from the delivery, till the end of the 20th to 28th week of pregnancy and continuing for one to four weeks after delivery.<sup>[3]</sup> As a result, the perinatal period is crucial to both the newborn's and the pregnant woman's general health. In terms of caries transmission, the main objective of perinatal oral health care is to reduce the amount of cariogenic bacteria in the mouth of the expectant mother in order to postpone the infant's colonisation by *Streptococci Mutans* (SM) for as long as possible. Premature birth, low birth weight, and pre-eclampsia are among the negative outcomes associated with periodontal disease during pregnancy, according to studies.<sup>[4]</sup> Pregnancy presents an opportune moment to prioritize health-enhancing activities, as many women engage consistently with healthcare providers. These professionals can identify risk factors prior to the onset of disease and assist in the creation of a dental home.<sup>[5]</sup>

### **ANTICIPATORY GUIDANCE:**

Anticipatory guidance refers to the proactive engagement with parents and patients regarding anticipated developmental changes that occur between medical appointments, encompassing essential information on daily care.<sup>[6]</sup> This proactive counselling involves delivering practical and developmentally appropriate insights into children's health, equipping parents to navigate significant physical, emotional, and psychological milestones.<sup>[7]</sup> It establishes a preventive framework that extends beyond the prevention of dental caries, addressing comprehensive aspects of children's oral health, including oral hygiene practices, dietary advice, and the recommended frequency of routine dental check-ups. Research indicates that, irrespective of race or health status, anticipatory guidance and pediatric visits

during the first two years of life can significantly lower hospitalization rates among children.<sup>[8]</sup> Consequently, implementing oral health anticipatory guidance can lead to a reduction in dental care costs.

### **DENTAL HOME CONCEPT:**

A dental home refers to a sustained partnership between a dentist and a patient, encompassing all facets of oral health care provided in a comprehensive, readily available, coordinated, and family-oriented manner. It is advisable to establish a dental home by the time a child reaches 12 months of age, with referrals to dental specialists made as needed.<sup>[9]</sup> Children who have a designated dental office are more likely to receive timely preventive and routine oral care. It is recommended that referrals from primary care physicians or other healthcare providers occur based on risk assessments as early as six months of age, six months after the first tooth emerges, and no later than 12 months of age.

### **FIRST DENTAL VISIT:**

The initial dental appointment represents a significant milestone in a child's development, and regular visits should be a fundamental aspect of their overall healthcare regimen. AAPD advises that infants, along with their parents, should have their first oral examination scheduled within six months following the emergence of their first primary tooth, but no later than their first birthday. The primary objective of this inaugural dental visit is to establish a foundation for preventive education and dental care, ensuring optimal oral health during infancy.<sup>[10]</sup> During this visit, the dentist should be equipped to detect any early lesions, evaluate the growth of craniofacial and dental structures, and provide guidance to parents regarding appropriate oral hygiene practices, nutrition, and responses to potential trauma.<sup>[11]</sup>

### **ORAL HEALTH EXAMINATION:**

The knee-to-knee position is typically advised for children aged 6 months to 3 years. It is essential for examiners and parents or caregivers to collaborate to facilitate a seamless transition from the interview phase to the evaluation process. Clinicians should provide a clear explanation of the procedure beforehand, following the 'tell, show, do' approach, and should be prepared for the possibility that infants may cry.<sup>[12]</sup> Positive experiences during visits are often linked to the child witnessing friendly and supportive interactions between the doctor and caregiver. This

positioning allows the child to maintain visual contact with the parent throughout the examination. Additionally, caregivers can observe clinical findings and hygiene practices directly while gently assisting in stabilizing the child for a safe clinical assessment.

### DIET COUNSELLING:

Dietary choices significantly influence both overall health and oral health. Research indicates that nutrition plays a crucial role in dental development, and malnutrition can worsen periodontal and oral infections. Consequently, it is advisable to establish healthy eating habits by 12 months of age and to sustain them throughout early childhood. The first dental visit should involve a comprehensive assessment of the child's dietary habits, including the types of foods consumed, their frequency and quantity, sugar intake, and snacking patterns.<sup>[13]</sup> Breastfeeding is considered the optimal nutrition for infants, as it provides a well-balanced array of nutrients tailored to their evolving needs.<sup>[14]</sup> AAPD advocates for breastfeeding as the preferred method of feeding, recommending exclusive breastfeeding for the first six months, followed by the introduction of iron-fortified solid foods between six to twelve months.<sup>[15]</sup>

Research indicates that infants who receive a higher proportion of breast milk compared to infant formula, or who are breast-fed for extended durations, tend to have a reduced likelihood of becoming overweight in later childhood and adolescence. Nevertheless, AAPD advises that unrestricted nocturnal breast-feeding should be discontinued once the first primary tooth has emerged.<sup>[16]</sup> Additional studies have shown that the pasteurization process involved in formula production can alter the structure of cow's milk proteins, potentially diminishing any protective effects against infections across species. Infant formulas are known to be acidogenic and have cariogenic properties. Therefore, it is crucial to evaluate the feeding practices and dietary habits of toddlers to determine their risk for early childhood caries (ECC). The Feeding At Sleep Time (FeAST) scale is a novel, parent-reported tool designed to assess various aspects of parental feeding behaviors related to the sleep-time of infants and toddlers.<sup>[17]</sup> This scale helps differentiate sleep-time feeding practices from other dietary habits, allowing for a better estimation of ECC risk and serving as a resource for further research into the impact of sleep-time feeding on ECC development.

### WEANING:

'Weaning' refers to the process of introducing

semi-solid foods to infants, typically around the age of six months. This stage often includes the addition of soft, cooked vegetables such as carrots, as well as diced soft fruits like pears and bananas.<sup>[18]</sup> AAPD recommends that any food provided to infants should be either mashed or cut into small, manageable pieces for easy chewing. It is important that this process occurs under appropriate supervision.

### *Weaning tips for mothers:*

1. Gradually enhance the quantity of food provided to an infant, ensuring that it aligns with their increasing appetite.
2. Offer food based on the infant's capacity to chew and digest effectively.
3. Create nutritious combinations using high-quality ingredients, which safeguard infants from illness and support healthy weight gain relative to their age.
4. Ensure that all food items and the utensils used for preparation are thoroughly cleaned.
5. Increase food intake during and following periods of illness, and provide additional fluids, particularly if the infant is experiencing diarrhea.

### TEETHING:

Teething is a natural physiological process that usually occurs with little or no difficulty and often with minimal complications. It involves the sequential emergence of an infant's teeth as they penetrate through the gums.<sup>[19]</sup> Teething is historically referred to as 'dentition difficilis,' a Latin term meaning difficult or pathological dentition. This process entails the movement of teeth from their position within the jawbone to their emergence in the oral cavity. The teething phase is generally characterized by an 8-day period, which encompasses 4 days prior to the tooth breaking through and 3 days afterward.<sup>[20]</sup> The eruption of primary teeth typically commences between 4 to 8 months of age, starting with the lower incisors, and is generally completed by 24 to 30 months when the second primary molars emerge. Common signs and symptoms associated with teething include irritability, increased drooling, mild fever, diarrhea, and disrupted sleep patterns. (Table No 1)<sup>[21]</sup>

Teething management encompasses both pharmacological and non-pharmacological approaches. Non-pharmacological strategies involve the use of solid silicone teething rings, as well as a selection of fresh and frozen fruits and vegetables that infants can 'gnaw' on for temporary relief. Additionally, gently massaging the baby's gums with a clean finger or wet gauze for one to two minutes can help alleviate

**Table 1:** Signs and symptoms of teething.

Signs/symptoms	Features
Irritability	Tooth rises closer to the surface; gums may become increasingly sore and painful.
Drooling	Drooling of saliva is increased than normal from 34 months of age
Coughing	The extra saliva can occasionally cause cough or gag.
Chin rash	Excessive drooling can irritate the skin around the chin and mouth leading to rashes.
Biting and gnawing	The counter pressure from biting or gnawing on an object helps to relieve the pressure from under the gums.
Diarrhoea	Most parents usually notice slightly looser bowel movements when a baby is teething. Most likely the cause is extra saliva swallowed.
Low grade fever	A low-grade fever can be defined as a temperature above 36.5 degrees and fluctuating constantly but not exceeding 38.5 degrees.
Disturbed sleep	Teething may cause pain more often at night. When the pain becomes too much child's sleep gets compromised.

discomfort. When local measures do not suffice, pharmacological options are available, including a variety of effective topical and systemic treatments, such as topical choline salicylate products and sugar-free paracetamol elixir, which is often the preferred systemic medication.<sup>[19]</sup>

### FLUORIDE:

Optimal fluoride exposure is crucial for all infants and children with teeth. The decision to administer fluoride should be tailored to the individual needs of each patient. Research supports the safe and effective use of fluoride in preventing and treating dental caries. After assessing all potential dietary sources of fluoride, it is advisable to consider systemic fluoride administration for children at risk of caries who consume water with fluoride levels below 0.6 ppm.<sup>[22]</sup> Community water fluoridation continues to be the most cost-effective strategy for caries prevention.<sup>[23]</sup> A significant portion of an infant's diet consists of human milk or milk from other mammals; however, the fluoride concentration in breast milk is low because only a small amount of fluoride transfers from plasma to breast milk. In contrast, infant formulas can contain varying levels of fluoride, primarily influenced by the fluoride content of the water used to prepare them.<sup>[24,25]</sup>

### CONCLUSION:

Infant oral healthcare begins ideally with prenatal oral health counselling for parents, which emphasizes on the benefits of a non-cariogenic diet and nutritious foods that are essential for proper fetal development. An array of factors contributes to the oral health of a child. Finding a dental home and having a preventive care plan can decrease the likelihood of the infant to experience dental disease. Educating the

parents and/or caregivers on preventive practices, good oral hygiene, transmission of cariogenic bacteria, injury prevention and the importance of having regular scheduled visits at appropriate intervals, plays an important role in maintaining the good oral health for child. An initial oral examination visit should occur within 6 months of the eruption of the first primary tooth but by no later than 12 months of age. Feeding practice and dietary counselling should be evaluated. Also, parents should be educated about teething which occurs between four to six months of age during which gums become red and swollen. With the combination of proper diet, early oral hygiene, and exposure to systemic fluorides, we can promote a generation of caries-free children, providing that the dental care program be initiated at or before the eruption of the first primary teeth.

### Financial Support and Sponsorship

Nil.

### Conflicts of Interest

There are no conflicts of interest.

### REFERENCES:

1. American Academy of Pediatric Dentistry. Perinatal and infant oral health care. The Reference Manual of Pediatric Dentistry. Chicago, Ill.: American Academy of Pediatric Dentistry; 2022:277-81. [https://www.aapd.org/globalassets/media/policies\\_guidelines/bp\\_perinataloralhealthcare.pdf](https://www.aapd.org/globalassets/media/policies_guidelines/bp_perinataloralhealthcare.pdf)
2. Dean JA. McDonald and Avery's dentistry for the child and adolescent-E-book. Elsevier Health Sciences. 11<sup>th</sup> Edn. 2021, Feb 2. Hardback ISBN: 9780323698207, eBook ISBN: 9780323698214. <https://shop.elsevier.com/books/mcdonald-and-averys-dentistry-for-the-child-and-adolescent/dean/978-0-323-69820-7>

3. American Academy of Pediatric Dentistry. Perinatal and infant oral health care. The Reference Manual of Pediatric Dentistry. Chicago, Ill.: American Academy of Pediatric Dentistry; 2023:312-6. [https://www.aapd.org/globalassets/media/policies\\_guidelines/bp\\_perinataloralhealthcare.pdf](https://www.aapd.org/globalassets/media/policies_guidelines/bp_perinataloralhealthcare.pdf)
4. Xiong X, Buekens P, Fraser WD, Beck J, Offenbacher S. Periodontal disease and adverse pregnancy outcomes: a systematic review. *BJOG*. 2006 Feb;113(2):135-43. doi: 10.1111/j.1471-0528.2005.00827.x. PMID: 16411989.
5. Vamos CA, Thompson EL, Avendano M, Daley EM, Quinonez RB, Boggess K. Oral health promotion interventions during pregnancy: a systematic review. *Community Dent Oral Epidemiol*. 2015 Oct;43(5):385-96. doi: 10.1111/cdoe.12167. Epub 2015 May 8. PMID: 25959402.
6. Ramos-Gomez FJ, Crall J, 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. PMID: 18044377.
7. Nowak AJ, Casamassimo PS. Using anticipatory guidance to provide early dental intervention. *J Am Dent Assoc*. 1995;126(8):1156-63. doi: 10.14219/jada.archive.1995.0337. PMID: 7560574.
8. Savage MF, Lee JY, Kotch JB, Vann WF Jr. Early preventive dental visits: effects on subsequent utilization and costs. *Pediatrics*. 2004 Oct;114(4):e418-23. doi: 10.1542/peds.2003-0469-F. PMID: 15466066.
9. American Academy of Pediatric Dentistry. Policy on the dental home. The Reference Manual of Pediatric Dentistry. Chicago, Ill.: American Academy of Pediatric Dentistry; 2023:35-7.
10. American Academy of Pediatric Dentistry. Clinical Affairs Committee--Infant Oral Health Subcommittee. Guideline on infant oral health care. *Pediatr Dent*. 2012;34(5):e148-52. PMID: 23211901.
11. Meera R, Muthu MS, Phanibabu M, Rathnaprabhu V. First dental visit of a child. *J Indian Soc Pedod Prev Dent*. 2008;26 Suppl 2:S68-71. PMID: 19075451.
12. Ramos-Gomez FJ, Crystal YO, Ng MW, Crall JJ, Erratum Featherstone JD. Pediatric dental care: prevention and management protocols based on caries risk assessment. *J Calif Dent Assoc*. 2010 Oct;38(10):746-61. in: *J Calif Dent Assoc*. 2010;38(11):790. PMID: 21162350; PMCID: PMC3470809.
13. Branger B, Camelot F, Droz D, Houbiers B, Marchalot A, Bruel H, Laczny E, Clement C. Breastfeeding and early childhood caries. Review of the literature, recommendations, and prevention. *Arch Pediatr*. 2019;26(8):497-503. doi: 10.1016/j.arcped.2019.10.004. Epub 2019 Nov 1. Erratum in: *Arch Pediatr*. 2020 Apr;27(3):172. PMID: 31685411.
14. Martin CR, Ling PR, Blackburn GL. Review of Infant Feeding: Key Features of Breast Milk and Infant Formula. *Nutrients*. 2016;8(5):279. doi: 10.3390/nu8050279. PMID: 27187450; PMCID: PMC4882692.
15. Fisher JO, Birch LL, Smiciklas-Wright H, Picciano MF. Breast-feeding through the first year predicts maternal control in feeding and subsequent toddler energy intakes. *J Am Diet Assoc*. 2000 Jun;100(6):641-6. doi: 10.1016/S0002-8223(00)00190-5. PMID: 10863566; PMCID: PMC2531149.
16. De Grauwe A, Aps JK, Martens LC. Early Childhood Caries (ECC): what's in a name? *Eur J Paediatr Dent*. 2004;5(2):62-70. PMID: 15198622.
17. Savage JS, Rollins, BY, Kugler KC. et al. Development of a theory-based questionnaire to assess structure and control in parent feeding (SCPF). *Int J Behav Nutr Phys Act* 14, 9 (2017). <https://doi.org/10.1186/s12966-017-0466-2>
18. Dupras TL, Schwarcz HP, Fairgrieve SI. Infant feeding and weaning practices in Roman Egypt. *Am J Phys Anthropol*. 2001;115(3):204-12. doi: 10.1002/ajpa.1075. PMID: 11424072.
19. Tushar Pruthi, et al. "A Comprehensive Approach for the Management of Teething-A Narrative Review". *Acta Scientific Dental Sciences*. 2023;7(3):81-83. <https://actascientific.com/ASDS/pdf/ASDS-07-1591.pdf>
20. Macknin ML, Piedmonte M, Jacobs J, Skibinski C. Symptoms associated with infant teething: a prospective study. *Pediatrics*. 2000;105(4 Pt 1):747-52. doi: 10.1542/peds.105.4.747. PMID: 10742315.
21. Meer Z, Meer A. Teething trouble and its management in children. *Int J Dent Clin*. 2011;3(2):75-77. file:///C:/Users/user/Downloads/Teething\_trouble\_and\_its\_management\_in\_children.pdf
22. Akpata ES. Occurrence and management of dental fluorosis. *Int Dent J*. 2001 Oct;51(5):325-33. doi: 10.1002/j.1875-595x.2001.tb00845.x. PMID: 11697585.
23. Esfandiari S, Jamal N, Feine J. Community-specific, preventive oral health policies: preventive measures on dental caries. *J Investig Clin Dent*. 2010 Aug;1(1):2-7. doi: 10.1111/j.2041-1626.2010.00006.x. PMID: 25427180.
24. Fomon SJ, Ekstrand J. Fluoride intake by infants. *J Public Health Dent*. 1999;59(4):229-34. doi: 10.1111/j.1752-7325.1999.tb03274.x. PMID: 10682328.
25. Ekstrand J. Fluoride intake in early infancy. *J Nutr*. 1989;119(12 Suppl):1856-60. doi: 10.1093/jn/119.12\_Suppl.1856. PMID: 2693648.