

# **FIRST SMILES: DENTAL HEALTH BEGINS AT BIRTH**

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The purpose of this monograph is to improve the oral health and overall pediatric health of children, birth to 5 years old, including those with disabilities and other special needs, by instructing primary care providers on how to screen, assess and refer children, and provide anticipatory guidance on oral health for young children and their families.

## **Learning Objectives**

Participants will be able to:

1. Describe ways in which oral health affects pregnant woman and their children, birth to 5 years old, including those with disabilities and other special needs.
2. Explain the process of gum disease.
3. Describe cavities as an infectious, transmissible disease.
4. List the elements of a basic risk assessment.
5. Articulate oral health assessment techniques and orofacial manifestations.
6. Discuss preventive strategies and anticipatory guidance on oral health for mothers, their babies, and young children, including those with disabilities and other special needs.
7. Explain the link between severe gum disease and preterm, low birth weight babies.
8. Identify dental resources available to parents of young children.
9. Describe ways to incorporate oral health assessment, parent education and referral into existing practice.

This project is a collaborative effort between the California Dental Association Foundation and The Dental Health Foundation. Training is supplemented with a website, at [www.First5OralHealth.org](http://www.First5OralHealth.org), which is updated routinely to provide the latest research references, education materials for families, links to web-based trainings, and other resources. The content and all of the materials for this course were reviewed by a Scientific Advisory Committee, composed of researchers, academics, policy-makers, public health professionals, and private health providers to assure that all information is both science-based and practical.

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Although dental decay significantly declined in the United States from the 1960s through the 1980s, it is still a major problem in adults and children. The dramatic reductions in levels of decay observed from 1960 to 1990 were related initially to the introduction of fluoride into the drinking water and subsequently to topical fluoride applications, especially through fluoridated dentifrice use and dental office topical fluoride. However, these tools are only successful up to a point, and we now need more-aggressive ways to deal with dental caries as a bacterially based transmissible infection. To place this into perspective, a recently published survey on the dental health of California's children, from data that was accumulated in 1993 and 1994, reported that:

- 27 percent of preschool children have untreated decay;
- 55 percent of 6- through 8-year-olds have untreated decay;
- Up to 75 percent of minority high school students need dental care; and California's children on average have twice the national level of untreated tooth decay.

Many millions of dollars are spent in California each year on the physical treatment of dental caries, rather than on prevention and intervention. Millions of hours are lost at school and work each year as a result of dental caries. There is a growing epidemic of early childhood caries in the United States, particularly in California.

### **Early Assessment**

The primary teeth are important in young children for several reasons. In addition to being essential for eating, primary teeth hold space in the mouth for the permanent teeth. Teeth are also essential for proper speech development. The primary teeth are important for smiling, which contributes to a child's self-esteem and social development.

Early oral health screening, risk assessment, and education are promoted by the American Academy of Pediatrics, the American Academy of Pediatric Dentistry, the American Dental Association, the American Public Health Association, and the American Association of Public Health Dentistry.



**Early Tooth Decay**

The American Academy of Pediatrics recommends that every child begin to receive oral health risk assessments by 6 months of age from a pediatrician or a qualified pediatric health care professional. This is supported by the American Academy of Pediatric Dentistry, which recommends that health care professionals and all stakeholders in children's health should support the identification of a dental home for all infants by 12 months of age.

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The average child in California visits a medical office at least 10 times during the first 3 years of life to receive both well-child and sick care. Most children do not visit the dental office until they are 3 years of age or older. The primary care physician is critical to assuring that children and their families receive early oral health assessment and preventive education.

### Causes of Early Childhood Caries

Early Childhood Caries, or ECC, is defined as any tooth decay in the primary dentition, including filled or extracted teeth. ECC is an infectious, transmissible disease caused by *mutans streptococci*, *lactobacilli*, and other acid producing bacteria. While the transmission is primarily vertical between mothers or other primary caregivers and infants for the majority of children, studies have also demonstrated horizontal transmission from children playing together sharing toys, or any other vehicle that shares saliva from one mouth to the other.



An early sign of demineralization is a chalky “white spot” lesion. When detected at this stage, the decay is reversible (Figure 1).

**Figure 1. Chalky “White Spot” lesions**

The reversal of the process is remineralization, which occurs when the tooth heals from the calcium and phosphate provided by saliva. This natural tooth repair is enhanced by fluoride if it is present in the mouth; and renders teeth more resistant than before to acid from bacteria. The natural process of demineralization and remineralization occurs in the mouth as part of daily eating, snacking and oral hygiene activities.

Severe ECC is characterized by a distinctive pattern of tooth decay in infants and young children, often beginning on the maxillary anterior teeth and rapidly progressing to the other primary teeth as they erupt. (Figure 2). ECC can begin to develop as soon as teeth erupt into the mouth at 6-10 months of age. Most lesions do not need to be restored until they have penetrated through the enamel into the dentin. Lesions contained in the tooth enamel can be reversed with a combination of fluoride and anti-bacterial treatment.



**Figure 2. Severe ECC**

Data from the 1993-94 California Oral Health Needs Assessment documented that California’s children fell well below the nation in oral health. About a third of California preschoolers and 69.2% of children in grades K-3 have experienced tooth decay. ECC is more prevalent among families with lower socio-economic status, and is more prevalent in certain ethnic or cultural groups, including the children of recent immigrants, Native American, Asian, African American, and Latino children. ECC may be more prevalent among children with disabilities and other special needs. This population of children with disabilities and other special needs may be as high as 25 percent of the child population nationwide.

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### Risk Assessment

The risk assessment can occur while interviewing the caregiver. This also allows an opportunity to build trust with both the caregiver and the child. The assessment should address the following topics:

1. Is the family's home served with fluoridated water, or do the children take fluoride supplements?
2. Do the caregivers clean the child's teeth with a fluoride toothpaste? If so, how?
3. Has the child been to a dentist yet? When was the last visit?
4. Have the primary caregivers or any of the child's siblings experienced cavities?
5. How often does the child snack? Ask the caregiver to describe a typical day's diet, noting if milk is offered at meals instead of sweetened beverages.

Families don't often know if their water is fluoridated. It may be helpful to have a chart which lists the fluoride content of local water sources.

### Exam

The knee-to-knee position is preferred by many medical and dental health professionals. The child is initially held in the mother's arms and slowly lowered to the physician's lap.

Some physicians will prefer positioning the child on the exam table and working from behind the head or having older children sitting on the exam table.

### Toothbrush Prophylaxis

Introducing the toothbrush first, and providing a toothbrush prophylaxis, or cleaning, reinforces use of an object the child is familiar with. A toddler can "help" with the cleaning of the teeth, while the clinician shows the caregiver proper oral hygiene and positioning techniques. This is a good time to reinforce the importance of cleaning the teeth daily, using a small dab of fluoride toothpaste and a child-sized toothbrush. Parents should assist with or brush their child's teeth until the child is eight years old.

### Oral Assessment

The oral assessment is easily integrated into the child's medical examination. An extra T is added to a familiar acronym, making it HEENTT. The final "T" represents Teeth. Figure 3 illustrates common findings of tooth decay. The toothbrush can serve as a mouth prop, preventing the child from biting down on your fingers. Use the toothbrush to "count" the child's teeth, while assessing for:

- Oral hygiene status (presence of thick plaque)
- Chalky white spots, brown spots, or obvious cavities
- Tooth defects
- Abscesses

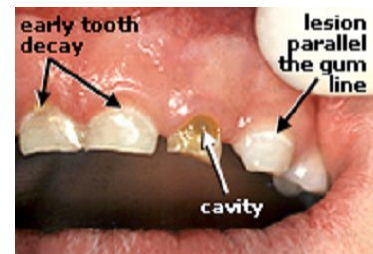


Figure 3. Findings of Tooth Decay

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A common finding indicating early tooth decay is the presence of chalky white spots (Figure 4). This is a hypocalcification of the enamel. These spots can be remineralized with the use of fluoride varnish. The progression of decay may manifest as brown spots (Figure 5), or mottled enamel.



**Fig. 4. Chalky White Spots**



**Fig. 5. Brown Spots**

It is less important to differentiate between tooth decay and tooth defects, as both would indicate a referral to the child's dentist.

With information from the interview and observations from the dental screening, the clinician can determine if the child is at low or high risk for dental caries. Refer children to a dentist if chalky white spots, brown spots, tooth defects are noted, or if there is any pain, infection, including swollen or bleeding gums, or abscesses.

Low risk	High risk
<ul style="list-style-type: none"><li>■ No carious lesions</li><li>■ No white spot lesions</li><li>■ No visible plaque</li></ul>	<ul style="list-style-type: none"><li>■ White spot lesions</li><li>■ Carious lesions</li><li>■ Visible plaque</li><li>■ Family history</li><li>■ Impaired saliva composition or flow</li><li>■ Frequent exposures to fermentable carbohydrates</li></ul>

### Cost of ECC

Treatment of ECC can range from hundreds to thousands of dollars in costs. In some cases, treatment requires hospitalization and procedures under general anesthesia. ECC places a large financial burden on third-party payors and public dental care programs including Medi-Cal, Healthy Families, and parents least able to afford treatment.

Once disease is established and caries penetrates to dentin and beyond, restorative care is essential. Restorative care restores the shape and function of the tooth and repairs decay. Close monitoring for follow-up care is needed. Unless there is follow through using contemporary preventive education and other strategies, various studies have shown that 40-50% of children treated for ECC have recurrent decay within 4-12 months. With only traditional treatment and no preventive follow-up, the disease progresses.

### **Summary and Anticipatory Guidance**

Preventive counseling also referred to as anticipatory guidance, can be summarized at the conclusion of the exam, along with findings and recommendations for follow-up. Talk with the caregiver about whether the child has any signs of tooth decay and whether the child is at high risk for future tooth decay. Risk-based anticipatory guidance will help the clinician focus messages to the most important issues for the child and caregiver. Offer simple, individualized messages to help the family prevent tooth decay.

For All Babies and Young Children:

- Water fluoridation
- Daily use of fluoride toothpaste
- Limit sugar and other fermentable carbohydrates

For High-Risk Patients:

- Fluoride Varnish
- Consider anti-bacterials such as chlorhexidine and xylitol gum for older children

### **Prevention of ECC**

ECC can be prevented with the active involvement of health care providers, encouraging the involvement of families and caregivers. ECC can be prevented by reducing pathological factors and strengthening the protective ones.

Children with disabilities and other special needs can have increased risk for ECC. They may have a reduced saliva flow due to medications and other factors. Their medications may contain sweeteners. Oral health care at home may be more inconsistent, including daily use of fluoride toothpaste. Most babies and young children with special needs are considered to be at higher risk for tooth decay.

While fluoride hasn't eradicated tooth decay, it is a key factor in the prevention and reduction of tooth decay. Fluoride inhibits demineralization, enhances remineralization, and inhibits plaque bacteria. Water fluoridation is the cornerstone of many public health programs. About 30% of California children currently benefit from fluoridated drinking water.

Fluoride toothpaste is effective at preventing dental caries. Daily use in the morning and before bedtime should be promoted for all babies and young children. A small pea-sized dab is the recommended amount, administered by wiping it around the teeth with a soft toothbrush, or soft cloth. The toothpaste should be placed on the width of the toothbrush, not the length. This results in a much smaller dab of toothpaste. The parents should wipe off excess until children can spit it out.

Fluoride varnish is a highly-concentrated fluoride product that can be beneficial for use with high-risk babies and young children. Fluoride varnish can be used up to three times in a two-week period for remineralization of white spot lesions. For more general prevention purposes, it can be applied three to four times a year. Any staff that is trained by a dentist or physician is allowed to apply fluoride varnish, according to COMDA, the California Nurse Practice Act, and

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the Medical Board of California. Pursuant to California Code of Regulations, Title 16, Division 10, section 1085(c) 14, “an unlicensed dental assistant is permitted to apply topical fluoride” and as such, “an unlicensed medical assistant is permitted to perform this same function under the supervision of a physician.” The First Smiles website maintains current information on scopes of practice and available training sessions.

Dental sealants are another effective method to prevent tooth decay. They are generally placed on the biting surfaces of posterior or molar teeth.

Physicians should talk with families about limiting the frequency of ingestion of simple carbohydrates, including sugary foods and drinks, and foods like white crackers and potato chips. The frequency of fermentable carbohydrate intake contributes to dental caries. Families should also be counseled to limit both total sugar intake and the frequency of carbohydrate exposures per day to enhance both general overall health as well as oral health.

Children should begin using a cup at 6 months of age and parents should consider weaning from the bottle at 12-14 months of age, transitioning to an open cup that isn't easily carried around all day.

Physicians should counsel parents not to let their babies go to sleep with a bottle or sippy cup. This greatly increases the exposure to carbohydrates, and upsets the caries balance. Prolonged exposure to the bottle effectively produces an acid bath around the teeth. Breastfeeding should be encouraged. Mothers should be advised that removing their child from their breast after feeding and wiping their baby's gums and teeth with a damp washcloth reduces the risk of ECC.

### **Other Interventions**

Physicians may also consider interventions during pregnancy or soon after birth. Modification of the mother's dental flora during the period from birth until the child is two years of age can significantly affect the child's dental flora. This can be done using anti-bacterials, specifically chlorhexidine and xylitol.

Chlorhexidine therapy consists of 0.12 percent chlorhexidine gluconate, used as a prescription mouth rinse; 10 ml daily for one week per month, for approximately one year. The disadvantage of chlorhexidine is that it has an unpleasant taste, can cause staining, and compliance is often poor. However, if used one week every month, staining is decreased, compliance may improve, and caries-causing bacterial levels will be reduced.

Xylitol therapy consists of daily use of lozenges, mints, or gum. Some are available over the counter, and other sources can be ordered from dental suppliers and the internet. Optimally, xylitol should be the first ingredient listed in over-the-counter gum and mints. The therapeutic dose is 5-10 grams per day.

Pregnant women should be encouraged to visit a dentist. Serious gum disease has been linked to premature low birth-weight babies. This visit also gives the dental team the opportunity to assess the mother's caries risk and subsequently the caries risk for her child and recommend the use of xylitol or chlorhexidine as appropriate after the baby is born.

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Effective primary prevention of ECC requires working with both parents and their babies. Families who have improved oral health will be more likely to become involved in promoting the oral health of their children.

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# First Smiles: Dental Health Begins at Birth

## Post Test Review

### 1. Indicate whether the following statements are true or false:

- |  | True                     | False                    |
|--|--------------------------|--------------------------|
| a) The infant's first dental visit should be made within 6 months of the eruption of the first primary tooth, and no later than age 12 months.                         | <input type="checkbox"/> | <input type="checkbox"/> |
| b) An adult has to help children brush their teeth until about the age of 5 years old  | <input type="checkbox"/> | <input type="checkbox"/> |
| c) In general, the behavioral issues in treating 0-5 year-old children with special needs are the same as those you would have with any other 0-5 year-old population. | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Medi-Cal and Healthy Families will reimburse for an office visit at which a fluoride varnish application is provided.   | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Research indicates xylitol gum reduces the number of bacteria transferred between caregivers and infants.   | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Chalky white spots on a child's teeth can be re-mineralized with fluoride varnish.  | <input type="checkbox"/> | <input type="checkbox"/> |

### 2. Which of the following is NOT generally considered a risk factor associated with early childhood caries?

- Frequent and prolonged exposure to liquids containing carbohydrates
- Frequent and prolonged breastfeeding
- Frequent snacking on foods containing protein
- Frequent snacking on foods containing fermentable carbohydrates

### 3. Which of the following is NOT a *pathological* factor in the caries balance equation?

- Decay-causing bacteria
- Frequency of fermentable carbohydrate ingestion
- Reduced salivary function
- Infrequent tooth brushing

### 4. Which of the following is NOT a *protective* factor in the caries balance equation?

- Fluoride and re-mineralization
- Daily flossing
- Antimicrobials such as chlorhexidine and xylitol
- Saliva and its components

### 5. According to national surveys, what is the most prevalent unmet need among children with special health care needs?

- Medical care needs
- Dental care needs
- Vision and eyeglasses needs
- Prescription drug needs

#### This information is needed for your CME/CEU certificate, if offered:

License # \_\_\_\_\_  MD/DO  NP/PA  RN  Medical student/resident  Other \_\_\_\_\_

Name (please print): \_\_\_\_\_

Telephone: \_\_\_\_\_ Fax: \_\_\_\_\_

Email (please print): \_\_\_\_\_

**Thank you. Return completed form to the trainer before you leave to receive CME/CEUs.**

This study is being conducted as part of the California First 5 Oral Health Education and Training project offered by the California Dental Association foundation and Dental Health Foundation (DHF). Questions and comments should be directed to Dr. Barbara Aved, evaluator, at BARBARA AVED ASSOCIATES (916) 428-2847 or DHF at (510) 663-3727.