

Module 4: Prevention of Oral Health Problems

INTRODUCTION

Prevention of dental caries and other oral health problems is critical because of the pain and cost associated with treatment, and also because of issues around access to care.

This module focuses on actions that health care providers and families can take to prevent the development of oral health problems.

After completing this module, you should be able to

- ? Identify recommendations for caries prevention
- ? List messages to use when providing anticipatory guidance for caries prevention
- ? Describe nutrition-related prevention actions, including the effects of specific types of foods
- ? Identify recommendations for fluoride supplementation
- ? Describe oral hygiene practices to prevent oral health problems
- ? Identify actions to promote maternal oral health
- ? Identify local, state, and national resources for oral health promotion

Early preventive care has been shown to be effective in preventing oral health problems among young children. In one study of children receiving Medicaid, fewer restorative and emergency visits were required by children who had their first preventive visit by age 1 year. Not only did this improve health outcomes, but it had financial implications. Dental-related costs were less for children who received earlier preventive care. (Savage)

What works?

The effectiveness of specific efforts to prevent caries and other health problems is an area of study and debate. Research indicates that individualized messages that are given on an on-going basis are the most effective. (Tinanoff 2002, Tinanoff 2000, Duggal)

Recommendations for prevention of caries include:

- ? Nutrition education and counseling – although education alone may not be sufficient to change behaviors, dietary counseling, with sensible, realistic and positive messages that are individualized to a family's food pattern are suggested. (Tinanoff 2002, Duggal, AAP, Kanellis)
- ? Early identification of individuals at high risk and targeted intervention (Duggal, AAP)
- ? Toothbrushing with fluoride-containing toothpaste (Tinanoff 2002, AAP, Kanellis, Marinho)
- ? Dental care, including application of topical fluorides, use of antimicrobials, application of sealants (Tinanoff 2002, AAP, Marinho)
- ? Systemic fluoride supplements (Tinanoff 2002, AAP)

Read more about the effectiveness of specific approaches

There has been recent discussion about the effectiveness of specific efforts to prevent caries and other oral health problems.

Although most recommendations call for education of families and individuals, there is some argument that general education has only a temporary effect on plaque levels and no effect on dental caries. (Tinanoff 2002, Benitez) In one small study, the preventive approach (one-time instructions for using fluoride gel and weaning from the nursing bottle) was not effective. The authors concluded that traditional behavior change methods were not effective. (Benitez)

Another study evaluated the effectiveness of regular home visits and counseling (every 3 months for the first two years of life and twice per year in the third year). Dental health educators provided a standard message (cup vs. bottle, brush teeth twice per day with fluoride toothpaste, and visit the dentist regularly) to each family. This early intervention was effective in decreasing the occurrence of caries and gingivitis in both children and mothers. (Kowash) Other studies also indicate the effectiveness of on-going counseling efforts. (Tinanoff 2002)

Motivational interviewing is a counseling technique that was originally used for adults with drug and alcohol addictions. Recently, the technique has been used for other issues with behavioral components, including overweight and obesity. One study looked at the use of motivational interviewing with parents of children ages 6 to 18 months. After 1 year, the children in the study group had fewer carious lesions than controls (Weinstein).

Anticipatory Guidance

Anticipatory guidance can be provided by dental health professionals as well as by other health care providers who may see the child and family on a more regular basis. Messages can include information about providing a “healthy diet,” fluoride supplementation, oral hygiene, and the importance of regular dental visits and mother’s oral health.

A study of the habits of WIC participants indicated potential risk factors for oral health problems:

- ? Use of retentive foods
- ? Use of bedtime bottle
- ? Lack of dental care and thus lack of information about parent-supervised toothbrushing, fluoride supplements if needed (Faine)

General preventive messages are reviewed below. Age-specific guidelines are provided in the Practical Applications section of this module.

Healthy Diet (Diet-related recommendations)

Recommendations should promote an adequate intake and appropriate habits (timing and frequency of meals/snacks) and should include consideration of the cariogenicity of foods. Use of the *US Dietary Guidelines for Americans* is suggested.

Timing

Recommendations should include guidelines for spacing meals and snacks to allow time for plaque pH to return to neutral. For children, this could be 4 to 6 meals and snacks each day, spaced at least 2 hours apart. (Mobley) Other recommendations include offering sweets at

mealtime, not between meals. If soft drinks are offered, they should be given at meal time and with a straw. (Duggal)

Type of foods offered: Cariogenicity

Nutrition counseling that uses categories such as “good foods” and “bad foods” is not effective for making long-term behavior changes. (Freeland-Graves) Instead, it has been suggested that practitioners give families realistic recommendations that incorporate appropriate amounts of most foods. (Duggal, Mobley)

Foods with high cariogenicity should be offered as part of a meal or snack and followed by appropriate oral hygiene. (Mobley) When a meal or snack cannot be followed by toothbrushing, it makes sense to offer foods with low cariogenicity.

A list describing the cariogenicity of some foods is included as Table 4-1. For some of the foods, studies have been conducted to demonstrate cariogenicity; for others the evidence is less strong.

Table 4-1. Cariogenic potential of foods and snacks

It is important to consider the developmental appropriateness of the foods listed, especially for children with delayed feeding skills.

<i>Noncariogenic</i>	<i>Low cariogenicity</i>	<i>High cariogenicity</i>
<p>Nuts* (for example, almonds, peanuts) Sunflower and pumpkin seeds</p> <p>Popcorn* Tuna fish Chicken, eggs Cottage cheese Cheese cubes (for example, cheddar, gouda, jack) Vegetables ** (for example, zucchini, broccoli, carrots, cauliflower, celery sticks, cucumber, mushrooms, peas, sweet peppers, tomatoes, turnips) Seltzer water Plain yogurt</p>	<p>Milk</p> <p>Fresh fruits (for example, oranges, peaches, berries, tangerines, apples, melons, pears, grapefruit, kiwi) Whole grain products Diet soft drinks</p>	<p>Cookies</p> <p>Cake</p> <p>Candy Raisins and other dried fruits Fruit roll-ups, dried fruit Breakfast bars Doughnuts</p> <p>Soda crackers</p> <p>Pretzels Sweetened dry cereals Granola bars Sweetened beverages (including fruit juices)</p>
<p>* Do not give to children under 3 years or who have swallowing disorders ** Lightly steamed vegetables are safer for young children. Adapted from (Faine).</p>		

Read more about the cariogenicity of specific foods

Some foods are more likely to lead to caries than others. Foods have non-, low-, or high- cariogenic potential depending on several properties:

- ? amount and type of fermentable carbohydrate available to oral bacteria; sucrose appears to be the most cariogenic sugar, lactose is less cariogenic
- ? length of time food remains in the mouth; sticky foods that adhere to teeth, foods that are retained for long periods of time (e.g., hard candy), and foods that are consumed with high frequency (e.g., sips of sweetened beverages throughout the day) are more cariogenic than foods that are eliminated quickly
- ? other components of the food that may be protective; for example, it is thought that the phospho-proteins in milk are protective and that milk may also have antibacterial factors. Aged cheeses are protective because they stimulate saliva flow, raising plaque calcium and phosphorus levels
- ? processing; for example, it is thought that starch has low cariogenicity unless it is finely ground, heat-treated, and eaten frequently

Read more about the potential protective effects of cheese

Protective effects of cheese

Remineralization can be enhanced by foods that are high in calcium, phosphate, and protein. Cheese has been found to be “anticariogenic” and protective against coronal and root caries.

Proposed mechanisms for the protective effects of cheese include:

- ? buffering effect against acid – plaque pH of individuals who chewed cheddar cheese after eating a sugary food returned toward neutrality faster than that of individuals who did not eat cheese. Aged cheeses prevented drop in pH more than non-aged cheeses.
- ? increased salivary flow (and thus, a protective buffer against plaque acids)
- ? inhibition of plaque bacteria
- ? enhanced remineralization effects of calcium, phosphate, and casein (Kashket)

Fluoride

Fluoride is a naturally-occurring mineral that is found in water sources. The use of fluoride (both systemic fluoride through community water fluoridation programs and topical fluoride applications such as toothpaste with fluoride) has played a critical role in improving the oral health of individuals; fluoridation of drinking water has been called one of the top ten public health measures of the twentieth century. (US PHS, ADA)

Read more about community water fluoridation

A comprehensive review of the literature suggests that tooth decay can be decreased through efforts to fluoridate community water supplies. In communities with fluoridated water supplies, the median decrease in tooth decay among children ages 4 to 17 years was between 29.1% and 50.7%. (Community Guide)

A potential negative effect of fluoridated water is the risk of dental fluorosis. Severe dental fluorosis can include staining and enamel pitting. (Warren) In the majority of cases, however, fluorosis is very mild. In addition, most of reported cases of fluorosis can be attributed to communities in the Northeast, where supplementation was given in excess of current recommendations. (US PSTF)

Fluoride intake should begin at 6 months of age (AAPD, US PSTF). If a child's water supply is not fluoridated (e.g., because of the use of well or bottled water or because of the exclusive use of breast milk or formula without fluoride), fluoride supplements are recommended. Because of the risk of fluorosis, routine supplementation is not recommended for individuals with fluoridated water supplies.

Table 4-2. Recommended Dietary Fluoride Supplement* Schedule

Age	Fluoride concentration in community drinking water**		
	Less than 0.3 ppm	0.6-0.6 ppm	Greater than 0.6 ppm
0-6 months	None	None	None
6 months-3 years	0.25 mg/d	None	None
3-6 years	0.50 mg/d	0.25 mg/d	None
6-16 years	1.0 mg/d	0.50 mg/d	None

*Sodium fluoride (2/2 mg sodium fluoride contains 1 mg fluoride ion)

** (1.0 parts per million (ppm) = 1 mg/L)

Source: Centers for Disease Control and Prevention. Recommendations for using fluoride to prevent and control dental caries in the United States. MMWR 2001;50(No.RR-14):8.

Read more about fluorosis

Fluorosis has been reported in individuals with excessive fluoride intakes. The most common signs of fluorosis are very subtle white spots on the permanent teeth. Individuals with severe fluorosis (e.g., because of intakes of naturally-occurring fluoride in wells in India) have brown staining on permanent teeth. It is unusual for well water in the US to contain significant amounts of fluoride, however, testing well water for fluoride is recommended. (ADA)

Current fluoride guidelines have been lowered to address the potential for fluorosis. For example, if a child who drinks fluoridated water and uses an appropriate amount of fluoridated toothpaste (pea-sized, or smaller), he or she will not develop fluorosis, even if the toothpaste is swallowed.

Topical fluoride applications are also used in many communities. Varnishes, foams, and gels are used to promote remineralization and decrease demineralization. (Kanellis, Marinho) In some states, non-dental practitioners can apply topical fluoride treatments, including varnishes.

Read more about fluoride on the American Dental Association's website:

<http://www.ada.org/public/topics/fluoride/index.asp> and
http://www.ada.org/public/topics/fluoride/fluoride_article01.asp.

Oral hygiene

Daily oral care

The American Academy of Pediatrics (AAP) recommends the following daily oral care for young children (ages 0-3 years):

- ? Parent brush child's teeth thoroughly twice each day. Children over age 2 years should use only a pea-sized amount of fluoride-containing toothpaste. (Pang)
- ? Floss daily when teeth are in contact with each other
- ? Judicious administration of topical and systemic fluoride

In addition, oral hygiene recommendations for mothers (and other caregivers) themselves include:

- ? Brush thoroughly twice each day
- ? Use fluoride containing toothpaste that is approved by the American Dental Association
- ? Rinse daily with an over-the-counter mouthrinse with 0.05% sodium fluoride (AAP)
- ? Receive regular dental care

Dental visits

The American Academy of Pediatric Dentistry (AAPD) recommends that a child's first visit to the dentist occur before 12 months of age or 6 months after first tooth erupts and then twice yearly, or more often, based on individual risk (AAPD). The AAPD has developed a caries risk assessment tool. http://www.aapd.org/members/referencemanual/pdfs/02-03/P_CariesRiskAssess.pdf

An American Academy of Pediatrics (AAP) policy statement recommends the establishment of a dental home for children who are at risk (including children with special health care needs). AAP recommendations also include referral to a dentist by 12 months of age (or 6 months after the eruption of the first tooth) and anticipatory guidance about growth and development and nutrition-related oral health issues (AAP). Frequency of visits should be determined by an assessment of individual's risk.

Lack of pediatric dental practitioners is a major barrier to dental care, both for preventive efforts and for treatment. Some dental clinics have developed partnerships with public health departments, school districts and early intervention programs to provide preventive care.

A statewide prevention program initiated in 2001 in North Carolina, Into the Mouth of Babes, aims to increase access to preventive dental services by encouraging primary care physicians and community health clinics to provide early preventive dental services. The program provides reimbursement to physicians for oral health risk assessment, screening, fluoride application, and provision of oral health education to children on Medicaid.

Efforts by non-dental providers

The Surgeon General's report on Oral Health identified assessment (and action) by non-dental professionals as critical to improving oral health (US DHHS 2000). Non-dental providers can take action by incorporating screening questions into their assessments and by providing anticipatory guidance about oral health issues.

See Module 5 for a discussion of screening for oral health problems.

Maternal Oral Health

The AAP suggests that dental care begin prenatally, with counseling and anticipatory guidance about the transmission of bacteria from mother to child and about oral hygiene for infants and young children (AAP). Several interventions have been proposed to prevent dental caries, including use of xylitol gum, antimicrobial rinses, sealants, and fluoride varnishes and foams.

Xylitol

Xylitol is a sugar alcohol that is non-cariogenic. It is thought that long-term xylitol consumption leads to *mutans streptococci* colonies that are less adherent. (Soderling) Clinical trials have demonstrated that chewing xylitol-sweetened gum is more effective at preventing transmission of *mutans streptococci* from mother to child than chlorhexidine or fluoride varnishes. (Lynch, Soderling) One longitudinal study of children whose mothers chewed xylitol-sweetened gum until the children were at least 2 years of age indicated lower infection rates even when the children were 6 years old. (Soderling)

Reduced rates of dental decay have been noted in several studies of children who chewed xylitol-sweetened gum on a regular basis. Field tests of xylitol-containing candies have also shown reduced caries rates. (Lynch)

The use of xylitol is still experimental, however, and no long-term studies have been completed.

Chewing gum and lozenges, however, are not safe for all children and can be dangerous for young children and many children with special health care needs. In addition, some dental professionals express concern about broadly recommending that children chew gum.

Antimicrobial rinses

Antimicrobial rinses, gels, and varnishes are also available. Use of these agents is sometimes suggested for mothers with untreated caries, to decrease the risk of transmission of *mutans streptococci*.

Chlorhexidine is one antimicrobial agent that has been shown to be effective in decreasing *mutans streptococci* transmission from mother to child and lowering rates of caries development. (Kanellis) Problems with the use of chlorhexidine can include compliance issues due to associated taste alterations and staining of teeth.

Sealants

School-based or school-linked programs that provide sealants have been shown to be effective at reducing caries rates. (CDC)

PRACTICAL APPLICATIONS

Age-specific Recommendations to Prevent Caries

Age-specific recommendations are summarized below. This information is also available through *Bright Futures in Practice: Oral Health* publications.

Prenatal

- ? Importance of a healthy diet during pregnancy (Tinanoff 2000)
- ? Information about transmission of *mutans streptococci* from mother to child (AAP, Tinanoff 2000)
- ? Preliminary information about preventive oral care approaches (AAP, Tinanoff 2000)

Birth to 1 year of age

- ? Adequate nutrition to promote optimal tooth development (Tinanoff 2000)
- ? Systemic fluoride supplements for infants older than 6 months whose water supply is not fluoridated (AAP, Tinanoff 2000, Griffen)
- ? Appropriate oral care: start tooth cleaning (with soft cloth or soft, child's toothbrush) when teeth erupt (Tinanoff 2000, Griffen)
- ? First dental visit 6 months after eruption of first tooth or by 12 months of age (AAPD)
- ? Appropriate feeding pattern: avoid bottle in bed; discourage dipping pacifiers in sugar, honey or syrup; begin transition to cup (around 6 months of age); discourage use of sippy cup between meals/snacks (AAP, Tinanoff 2000, Griffen)

1 to 2 years of age

- ? Systemic fluoride supplements for children whose water supply is not fluoridated (AAP, Tinanoff 2000, Griffen)
- ? Appropriate oral care: toothbrushing with pea-sized amount of fluoride-containing toothpaste (Tinanoff 2000, Griffen); flossing with flossing aid if primary teeth are in contact with one another; oral care after sucrose-containing medications (Griffen)
- ? Dental visit as appropriate (every 3 months to 1 per year) (Griffen)
- ? Appropriate eating pattern: discourage use of bottle in bed; complete weaning to cup; discourage sweetened beverages between meals/snacks; limit juice or sugar-containing beverages to 4 oz per day and only in a cup; limit cariogenic foods to mealtimes and follow with "quick oral clearance" (e.g., toothbrushing or consumption of protective foods); promote noncariogenic foods for snacks (Tinanoff 2000, Griffen)

2 to 5 years of age

- ? Systemic fluoride supplements for children whose water supply is not fluoridated (AAP, Tinanoff 2000, Griffen)
- ? Appropriate oral care: supervised toothbrushing with pea-sized amount of fluoride-containing toothpaste (Tinanoff 2000, Griffen); flossing with flossing aid if primary teeth are in contact with one another; oral care after sucrose-containing medications (Griffen)
- ? Dental visit twice per year (Griffen) or more often for children at high risk
- ? Appropriate eating pattern: encourage intake of noncariogenic foods for meals and snacks; discourage consumption of cariogenic foods, especially those consumed slowly; encourage eating only at regular meals/snacks (Tinanoff 2000, Griffen)

5 to 12 years of age

- ? Systemic fluoride supplements children whose water supply is not fluoridated (AAP)
- ? Appropriate oral care: toothbrushing with fluoride-containing toothpaste (Tinanoff 2000, Griffen); flossing if teeth are in contact with one another (Griffen)
- ? Dental visit twice per year, may include use of sealants (Griffen)
- ? Appropriate eating pattern: limit number of carbohydrate exposures, sticky foods; limit cariogenic foods to mealtimes and follow with "quick oral clearance" (e.g., toothbrushing or consumption of protective foods); parents should continue to monitor frequency of carbohydrate intake. (Griffen)

Adolescents

- ? Appropriate oral care: toothbrushing with fluoride-containing toothpaste; flossing (Griffen)
- ? Dental visit twice per year, may include use of sealants (Griffen)
- ? Appropriate feeding patterns: limit cariogenic foods to mealtimes and follow with "quick oral clearance" (e.g., toothbrushing or consumption of protective foods); promote

noncariogenic foods for snacks; discourage chewing of sugared gum; discourage carbonated beverage consumption between meals (Griffen);

Nutrition and Oral Health Strategies

Strategies for parents at home

Each day:

- ? Limit intake of sweet or sticky sugars (including sticky or sweetened chewable vitamin supplements) to meal time
- ? Encourage children to consume water and/or rinse mouth after eating
- ? Use appropriate fluoride drops, tablets, toothpaste, rinses, gels
- ? Supervise daily plaque removal by dispensing toothpaste to young children
- ? Based on abilities allow child to assist or perform tooth brushing; for children with special health care needs use adaptive techniques as needed
- ? Adults should complete thorough brushing
- ? Demonstrate and/or complete flossing

Preparation for dental visits:

- ? Seek dentist who treats children and/or children with special health care needs
- ? Discuss special needs of child and premedication before visit, if needed
- ? Rehearse office visit with child; previsit the dental office
- ? Bring list of medications, if any

Strategies for Health Professionals

- ? Provide education about use of bottle and/or pacifier
- ? Monitor/instruct parents on daily oral cleansing
- ? Provide oral health screening at well child visits
- ? Provide education about foods choices for oral health and nourishment

Dental Visit – every 6 months

- ? Discuss special needs of child and premedication before visit, if needed
- ? Review medications for potential oral health implications
- ? Examine soft tissues and teeth
- ? Clean teeth
- ? Place sealant on molars and premolars
- ? Apply topical fluoride
- ? Provide instruction in daily cleaning of child's mouth

Criteria for healthy snacks for children

- ? It is both unrealistic and undesirable to try to eliminate foods containing carbohydrates. Encouraging children to snack on healthy, less cariogenic foods can reduce the frequency of carbohydrate consumption.
- ? Carbohydrates in combination with fats and proteins may inhibit caries activity. (Fats and proteins may have a protective effect on enamel, making it less susceptible to acid attack by coating the teeth and increasing the buffering ability of saliva.)
- ? Rinsing with water following snacking may also curtail the caries process. Also rinse with water following sticky or sweetened chewable vitamin supplements.
- ? Complex carbohydrates found in grain products, fruits, and vegetables should be encouraged over simple carbohydrates found in candy, cookies, cake, sweetened beverages, fruit juice, or fruit roll-ups.
- ? Offer foods that do not stick to the teeth and/or do not extend the period of time for acid production in dental plaque, such as fresh fruits, and/or cheese.

- ? Offer foods that do not become lodged between the teeth.
- ? Offer xylitol-sweetened (sugarless) gum, which stimulates saliva flow and neutralizes plaque acids, to older children.

Infant and early childhood feeding, strategies from *Bright Futures in Practice: Oral Health and Bright Futures in Practice: Nutrition*

Birth to 1 Year

- ? Breastmilk is the ideal food for infants.
- ? Do not put an infant to sleep with a bottle or allow frequent and prolonged bottle feedings of formula, fruit juice, sweetened beverages (e.g., fruit drink, soda), or other liquids (except water).
- ? Begin to wean the infant from a bottle gradually, at about 9 to 10 months.
- ? Juice should not be introduced into the diet of infants before 6 months. Do not serve juice in a bottle or covered cup (a “sippy cup”) that allows the infant to consume juice at will throughout the day. Serve 100 percent fruit juice or reconstituted juice.
- ? Do not dip pacifiers in sweetened foods (e.g., sugar, honey, syrup).

1 to 5 Years

- ? Do not put the child to sleep with a bottle or allow frequent and prolonged bottle feedings of formula, fruit juice, sweetened beverages (e.g., fruit drink, soda), or other liquids (except water).
- ? Wean the child from a bottle to a cup by 12 to 14 months.
- ? Serve the child juice in a cup, and limit the child’s consumption of juice to 4 to 6 oz per day.
- ? Encourage the child to eat fruits rather than drinking fruit juice to meet the recommended daily fruit intake.
- ? Promote less-cariogenic foods for snacks. Serve grain products (bread, bagels, crackers), dairy products (milk, cheese, yogurt, pudding), fruits, and vegetables.
- ? Make sure the child drinks plenty of water throughout the day, especially between meals and snacks.

Case example: Charlotte is a 3-year old who is being seen by a nutritionist because of concerns about overweight. The nutritionist gets information about Charlotte’s food pattern. She eats 3 meals and several snacks each day. She likes to drink iced herbal tea sweetened with honey throughout the day. To prevent spills, her family gives this to her in a sippy cup that she carries around with her.

Recommendations for weight management (including appropriate portion sizes and limiting eating to scheduled meals and snacks) are made. The nutritionist also identifies some oral health concerns and provides anticipatory guidance to prevent caries. Which of the following recommendations are most appropriate for Charlotte and her family?

- a) Decrease frequency of intake of sugary foods; offer sweet foods only at mealtimes that can be followed by good oral hygiene
- b) Provide a fluoride supplement to Charlotte
- c) Limit intake of sweetened tea (and other sweetened beverages including juice and soda); offer at mealtime only, if at all
- d) Use a soft cloth to clean Charlotte’s teeth nightly
- e) Ensure that Charlotte visits a dentist regularly
- f) Ensure that Charlotte’s mother receives good oral care

The correct answers are a, c, e, and f.

- a. Limiting sugary foods will also help with weight management. A list of snacks with low cariogenicity could be provided to Charlotte's family.
- b. Questions should be asked to determine the adequacy of Charlotte's fluoride intake, and recommendations made based on this information.
- c. Limiting tea and other sweetened beverages decreases acid exposure to the teeth and may also help with weight management. If a sippy cup is used throughout the day, it should contain only water.
- d. A soft cloth would be appropriate for a child under age 12 months. Charlotte should have assistance brushing her teeth twice daily with a pea-sized amount of fluoride-containing toothpaste. If her primary teeth are in contact with one another, her family should use a flossing aid to floss her teeth.
- e. If Charlotte's family does not already have a dentist who sees children, a referral can be facilitated.
- f. Recommendations for maternal oral health promotion include brushing twice daily, flossing, and use of fluoride-containing mouthrinse. Other intimate caregivers should also practice good oral hygiene.

QUIZ

- (1) Recommendations for prevention of caries include:
 - a. Nutrition education and counseling
 - b. Early identification of risk and targeted intervention
 - c. Toothbrushing with fluoride-containing toothpaste
 - d. Over-the counter fluoride supplements for all children
- (2) True or False: Anticipatory guidance from non-dental health care providers should include information about providing a healthy diet, oral hygiene, and the importance of regular dental visits.
 - a. True, because these message can be provided by a variety of health care providers.
 - b. True, because these are the only important messages.
 - c. False, because only dental professionals should provide these messages.
 - d. False, because these are not the most important messages.
- (3) Sweets can be cariogenic. Which of the following is probably the most effective message to give to families to minimize the cariogenic effects of sweets?
 - a. Do not offer sweets to your child
 - b. Offer sweets at mealtimes that can be followed by good oral hygiene
 - c. Offer sweets between meals to allow plaque pH to return to neutral
 - d. Offer only sweet foods that are crunchy, avoid sticky foods

- (4) Which of the following is the most appropriate meal and snack pattern for most children?
- 3 meals each day, snacks on demand
 - 3 meals each day, at least 4 hours apart, no snacks
 - 4 to 6 meals and snack each day, spaced at least 2 hours apart
 - 8 to 12 meals and snacks each day, spaced about 1 hour apart
- (5) Which of the following has been called one of the top ten public health measures of the twentieth century?
- Xylitol gum
 - Fluoride mouthrinse
 - Fluoride-containing toothpaste
 - Fluoridation of drinking water
- (6) True or false: If a child's water supply is fluoridated, the use of topical fluoride (e.g., varnishes, foams, and gels) is not recommended.
- True
 - False
- (7) The American Academy of Pediatric Dentistry (AAPD) recommends that a child's first visit to the dentist occur before what age?
- 3 months
 - 12 months
 - 18 months
 - 2 years
- (8) Maternal oral health is important to prevention of oral health problems in children because:
- Susceptibility to caries is genetic
 - Tooth development begins in utero
 - Bacteria are often transmitted from mother to child
 - If mother's oral hygiene practices are good, she is likely to take good care of her child's teeth
- (9) Which of the following interventions have been proposed to promote good maternal oral health and prevent dental caries?
- Use of xylitol gum, antimicrobial rinses, and sealants
 - Use of xylitol gum and supplemental fluoride
 - Use of fluoride-containing toothpaste and supplemental fluoride
 - Use of antimicrobial rinses, antibiotics, and daily flossing
- (10) It is thought that long-term use of xylitol gum leads to less dental caries because:
- Xylitol is a sugar alcohol that kills *mutans streptococci*
 - Chewing gum decreased intake of cariogenic foods
 - Xylitol gum is sugar-free and therefore not cariogenic
 - Xylitol consumption leads to *mutans streptococci* colonies that are less adherent

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US Department of Health and Human Services (US DHHS). *Oral Health in America: A report of the Surgeon General – Executive Summary*. Rockville, MD: US Department of Health and Human Services, National Institute of Dental and Craniofacial Research, National Institutes of Health; 2000. Online: <http://www.nidcr.nih.gov/sgr/sgr.htm> and more information at <http://www.nidr.nih.gov/sgr/children/children.htm> Accessed May 04, 2004.

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RESOURCES

General Oral Health

Bright Futures in Practice: Oral Health Quick Reference Cards

Casamassimo P (Ed). Bright Futures in Practice: Oral health quick reference cards. Arlington VA: National Center for Education in Maternal and Child Health. 1997.

These cards provide information for use in supervising the oral health of infants, children, and adolescents. For each stage of growth, the cards list interview questions, desired health outcomes, and anticipatory guidance. The cards also list risk factors for dental caries, periodontal disease, malocclusion, and injury as well as steps that can be taken to protect against these problems.

The reference cards can be downloaded or ordered online:
http://www.brightfutures.org/oralhealth/quick_cards.html

North Carolina Oral Health Section

The website for the Oral Health Section of the North Carolina Department of Health and Human Services includes educational resources for individuals and students, including a curriculum is for students grades K-6. This curriculum is available for all elementary school teachers in North Carolina and for parents who school their children at home. The curriculum correlates with the NC Department of Public Instruction's Statewide Comprehensive Curriculum for public schools. Other features of the website include resources related to access to dental care, assessing and improving the oral health of communities, and information about a public health residency program.

Materials can be downloaded or ordered online:
<http://www.communityhealth.dhhs.state.nc.us/dental/>

Nutrition-specific

WIC Lesson Plans

Maryland Department of Health and Mental Hygiene, Office of Oral Health. WIC Lesson Plans. Baltimore MD: Office of Oral Health, Maryland Department of Health and Mental Hygiene. 2003.

This series of oral health lesson plans was developed for use by counselors in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). Each lesson plan is accompanied by an activity page for parents and children to complete together.



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<http://www.fha.state.md.us/oralhealth/html/wicplan.html>

Educational handout: From baby bottle to cup

American Dental Association. From baby bottle to cup. Journal of the American Dental Association. 2004; 135:387.

This 1-page handout for families describes information about selecting and using “sippy cups” and promoting good oral health.

http://www.ada.org/prof/resources/pubs/jada/patient/patient_36.pdf

USDA National Fluoride Database of Selected Beverages and Foods

USDA. USDA National Fluoride Database of Selected Beverages and Foods – 2004. Nutrient Data Laboratory, Beltsville Human Nutrition Research Center, Agriculture Research Service, US Department of Agriculture.

This database includes information about the amount of fluoride in foods and beverages.

<http://www.ars.usda.gov/Services/docs.htm?docid=6312>

Prevention

Bright Futures in Practice: Oral Health Pocket Guide

Casamassimo P, Holt K, eds. Bright Futures in Practice: Oral Health – Pocket Guide. Washington, DC: National Maternal and Child Oral Health Resource Center. 2004.

Bright Futures in Practice: Oral Health-Pocket Guide is a resource to assist health professionals in providing oral health care for infants, children, adolescents, and pregnant and postpartum women. The pocket guide was developed by the National Maternal and Child Oral Health Resource Center working in collaboration with the Bright Futures Education Center at the American Academy of Pediatrics, with support from the Maternal and Child Health Bureau. The pocket guide offers health professionals an overview of preventive oral health supervision for five developmental periods-pregnancy and postpartum, infancy, early childhood, middle childhood, and adolescence. It is designed to be a useful tool for a wide array of health professionals including dentists, dental hygienists, physicians, physician assistants, nurses, dietitians, and others.

The pocket guide is available from the Bright Futures Oral Health Toolbox at <http://www.mchoralhealth.org/Toolbox/professionals.html>. Ordering information also at this website.

Fact Sheet: Promoting Awareness, Preventing Pain: Facts on Early Childhood Caries (ECC)

Promoting Awareness, Preventing Pain: Facts on Early Childhood Caries (ECC), a fact sheet published by the National Maternal and Child Oral Health Resource Center (OHRC), presents information on dental caries in the primary teeth of children from birth through age 5. The fact sheet defines ECC, describes who is at risk, and presents information on both the financial and the human costs of ECC. It also suggests ways in which health professionals can reduce a child's risk for ECC. The fact sheet is intended for use by health professionals,



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program administrators, policymakers, and others working to improve the oral health status of infants, children, and their families.

It is available on the OHRC Web site at
<http://www.mchoralhealth.org/PDFs/ECCFactSheet.pdf>.

Healthy Smile, Happy Child: Early childhood caries prevention

Nevada Bureau of Family Health Services, Maternal and Child Health Oral Health Initiative. Healthy Smile, Happy Child: Early childhood caries prevention. Carson City, NV: Maternal and Child Health, Nevada Bureau of Family Health Services. 2002.

Materials on early childhood caries prevention are provided, including a brochure, anticipatory guidance curriculum, presenter materials, and fluoride varnish training manual.

<http://www.mchoralhealth.org/materials/multiples/healthysmile.html> or contact Christine Forsch, Nevada Bureau of Family Health Services (telephone – 775/684-4285)

Share the Care – Dental Health Initiative of San Diego

Share the Care Dental Health Initiative of San Diego is a partnership between the County of San Diego Health and Human Services Agency, the San Diego County Dental Society, and the San Diego County Dental Health Coalition. It provides access to emergency dental care for children and offers information and education to professionals, parents, and children to foster ongoing preventive dental care.

Referrals for dental care can be made by school nurses and health assistants, health clinics, and community agencies. Children ages 5-18 years who are eligible for free or reduced school lunch and do not have resources for dental care are eligible.

Dental Health resources are available on the website and include brochures, curricula and activities related to dental health, nutrition, dental safety, and training materials

<http://www.sharethecaredental.org>; telephone: 619/692-8858

Project: PREVENTION! Early childhood cavities prevention provider training manual

Oregon Department of Human Services, Office of Medical Assistance Programs. Project PREVENTION! Early childhood cavities prevention provider training manual. Salem OR: Oregon Department of Human Services. 2001.

This packet was disseminated to pediatricians, family practice physicians, general practice physicians, obstetrician/gynecologists, pediatric nurse practitioners, physician assistants, public health nurses, WIC programs, Early Head Start Programs, tribal clinics, and Federally Qualified Health Centers. It includes reproducible handouts for families, anticipatory guidance, and questionnaires.

<http://www.dhs.state.or.us/publichealth/dental/eccp/p-toc.cfm>



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Baby Teeth: Love 'em and Lose 'em

Baby Teeth – Love 'em and Lose 'em is a video that convinces parents of the importance of baby teeth and how to care for them. Available in English (15 minutes) and Spanish (18 minutes). \$10

Washington Association of Local WIC Agencies,
<http://www.walwica.org/atwalwica.htm#products>

Baby Teeth II: The first dental visit with Sam Smile

This non-traditional education video prepares parents for their child's first dental visit. It is available in English (10:37 min).

Washington Association of Local WIC Agencies,
<http://www.walwica.org/atwalwica.htm#products>

Preventive guidelines for the preschool patient

Soxman JA. Preventive guidelines for the preschool patient. *General Dentistry*. 2005; 53(1): 77-80.

This article provides guidelines for dentists (risk factors, preventive guidelines), and is useful for non-dental professional as well.

http://www.agd.org/library/2005/feb/Soxman_153.pdf

Head Start: An Opportunity to Improve the Oral Health of Children and Families

Bertness J, Holt K. Head Start: An opportunity to improve the oral health of children and families. Washington DC: National Maternal and Child Health Oral Resource Center. 2003.

This document discusses Head Start programs' potential role in providing participants with access to oral health services, including education, screenings, and examinations and includes a profile of current Head Start participants, describes their access to oral health services and their oral health status, and outlines promising strategies. It is intended for use by policymakers, researchers, health professionals, and others interested in improving children's oral health.

<http://www.mchoralhealth.org/PDFs/HSOHFactSheet.pdf>

Medical Providers Oral Health Education Project

Endowment for Health. Medical Providers Oral Health Education Project: New Hampshire: 2002-2005. Concord, NH: Endowment for Health. 2002.

This resource describes a project to educate physicians and dental hygienists about dental caries in children under age 3 years. Materials include age-specific forms and handouts such as questionnaires, assessment and recommendation forms, and protocols.

Available for loan or on-line <http://www.mchoralhealth.org/pdfs/medicalprovOHed.pdf>



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The Oral Health Tip Sheet for Head Start Staff: Working with Parents to Improve Access to Oral Health Care

Holt K, Cole S. The Oral Health Tip Sheet for Head Start Staff: Working with Parents to Improve Access to Oral Health Care. Washington DC: National Maternal and Child Oral Health Resource Center, 2003.

This tip sheet is intended to help Head Start staff working with health professionals ensure that pregnant women, infants, and children enrolled in Head Start receive oral care.

<http://www.mchoralhealth.org/PDFs/HSOHTipParent.pdf>

Minnesota Dental Association Website

Minnesota Dental Association addresses issues with both regular and sugar free soft drinks. The site features handouts, posters, and stickers.

<http://www.mndental.org>

Colgate: Bright Smiles, Bright Futures

This guide outlines the key messages of oral health from pregnancy through the toddler years. Print color brochures to use as a reference during each of these life stages: prenatal, 0-6 months, 6-18 months, 18-24 months.

http://www.colgatebsbf.com/parents/par_oral_preg.asp

Fluoride and Fluoridation

Information about fluoride and supplementation on the American Dental Association Website.

<http://www.ada.org/public/topics/fluoride/facts/index.asp>

Community Water Fluoridation: A state best practice in dental caries prevention

Published by the Association of State and Territorial Health Officers, the brief presents an overview of community water fluoridation (CWF). It includes a review of the scientific evidence for the effectiveness of CWF and the cost effectiveness of CWF, a discussion of national recommendations, and examples of how state public health agencies are striving to ensure optimal CWF coverage.

http://www.astho.org/templates/display_pub.php?pub_id=556&admin=1

Proceedings of the Head Start Partners Oral Health Forum

Proceedings of the Head Start Partners Oral Health Forum. Journal of Public Health Dentistry. 2000; 60(3): 193-232.

This special reprint of portions of the Journal of Public Health Dentistry presents papers and responses given at the September 1999 Head Start Partners Oral Health Forum. General topics covered include nutrition and oral health; partnering for oral health; prevention, suppression, and management of caries; and accessing oral health services. The forum focused on early childhood in general and on participants in Head Start, Early Head Start, and WIC. Available at no charge.

HRSA Information Center <http://www.ask.hrsa.gov> or telephone: 888-ASK-HRSA; Document number MCHN023.



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Head Start Oral Health Awareness Lesson Plans: A teacher's guide for creating healthy smiles

Maryland Department of Health and Mental Hygiene, office of Oral Health and Head Start Oral Health Workgroup. Head Start Oral Health Awareness Lesson Plans: A teacher's guide for creating healthy smiles. Baltimore, MD: Maryland Department of Health and Mental Hygiene. 2002.

These lesson plans, developed for Head Start classrooms in Maryland contain activities, songs, and projects intended to help introduce good oral health habits to young children.

Available at no charge online: <http://www.fha.state.md.us/oralhealth/html/hsplan.html>; or telephone 410/767-5300.

Early Childhood Caries: Trainings and Protocols

Multnomah County Health Department, School/Community Dental Programs. Early Childhood Caries: Trainings and protocols. Portland, OR: Multnomah County Health Department, School/Community Dental Programs. 2002.

This manual outlines training for early childhood caries prevention for non-oral health professionals. The manual also contains illustrations, question sheets, checklists, sample forms, and handouts written in English, Vietnamese, Spanish, and Russian.

LeAnn Dooley, Multnomah County Health Department; telephone: 503/988-3905.

Policy Statements, Government Reports

Surgeon General Report

US Department of Health and Human Services. Oral Health in America: A report of the Surgeon General – Executive Summary. Rockville, MD: US Department of Health and Human Services, National Institute of Dental and Craniofacial Research, National Institutes of Health; 2000.

This report was released in May 2000 and calls for a national partnership to provide opportunities for individuals, communities and health professionals to maintain and improve the nation's oral health. Major barriers to good oral health are identified, and the risks of poor oral health to overall health are described.

Available at <http://www2.nidcr.nih.gov/sgr/sgrweb/welcome.htm> and more information at <http://www.nidcr.nih.gov/AboutNIDCR/SurgeonGeneral/>



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Oral health risk assessment timing and establishment of the dental home

American Academy of Pediatrics Section on Pediatric Dentistry. Oral health risk assessment timing and establishment of the dental home. *Pediatrics*. 2003; 111(5):1113-1116. (Policy Statement)

The AAP Section on Pediatric Dentistry compiled information on basic preventive strategies, oral health risk assessment, groups at risk for dental caries, establishing the dental home (an accessible, continuous, comprehensive source of care), anticipatory guidance, and parent and child education.

Recommendations include the following:

- ? All health professionals who serve mothers and infants should integrate into their practices parent and caregiver education on effective methods for preventing ECC.
- ? Information about the infectious and transmissible nature of the bacteria that causes ECC and about oral health risk assessment methods, anticipatory guidance, and early intervention should be included in the curriculum of all pediatric medical residency programs and postgraduate continuing medical education programs.
- ? Every child should begin to receive oral health risk assessments, conducted by a pediatrician or another qualified pediatric health professional, by age 6 months.
- ? Pediatricians, family practitioners, and pediatric nurse practitioners and physician assistants should be trained to perform oral health risk assessments on all children beginning by age 6 months to identify known risk factors for ECC.
- ? Between age 6 months and age 12 months, infants identified as being at significant risk for dental caries or as being in one of the risk groups should be entered into an aggressive anticipatory guidance and intervention program provided by a dentist.
- ? Pediatricians should support the concept of identifying a dental home as ideal for all children during infancy or early childhood.

<http://aappolicy.aappublications.org/cgi/content/full/pediatrics;111/5/1113>

State Efforts to Improve Children's Oral Health

State Efforts to Improve Children's Oral Health, an issue brief published by the National Governors' Association Center for Best Practices, presents information on the problems, costs, and access and workforce issues confronting children's oral health. The staff of the center's health policy studies division compiled information on how specific states are addressing problems in promoting education and prevention, increasing coverage and access, enhancing the dental work force, improving financing and reimbursement, and improving the quality of data and surveillance. The authors suggest that states can use a combination of approaches to improve the quality of children's oral health. The issue brief is intended to provide governors and others interested in child oral health policy with tools and information on innovative and cost-effective services.

It is available at <http://www.nga.org/cda/files/1102CHILDORALHEALTH.pdf>.



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Initiatives, Projects

Access to Baby and Child Dentistry Extended (ABCDE)

ABCD focuses on preventive and restorative dental care for Medicaid-eligible children from birth to age six, with emphasis on enrollment by age one. It is based upon the premise that starting dental visits early will yield positive behaviors by both parents and children, thereby helping to control the caries process and reduce the need for costly future restorative work. The first ABCD program opened for enrollment in Spokane, Washington in February 1995 as a collaborative effort between several partners in the public and private sectors. Its success has led other county dental societies and health districts in Washington to adopt the program, as well as prompted interest from other states. This website was created to assist others in replicating the ABCD model or in using some of its components in existing dental practices or oral health programs.

<http://abcd-dental.org/> Also, described in Milgrom P, et al. Making Medicaid child dental services work: a partnership in Washington state. J Am Dent Assoc. 1997; 128: 1440-6.

Citizens Watch for Oral Health

The Citizens Watch for Oral Health is a Washington State campaign to improve the oral health of children and seniors by promoting prevention, media coverage, and policy action. Key messages and suggestions and resources for activities, including posters and ads, are featured on the website.

<http://www.kidsoralhealth.org/>

Give Kids a Smile

Give Kids a Smile National Children's dental access day takes place in February and is a day set aside for providing free dental care and education to children from families with low incomes. The concept of this initiative, sponsored by the American Dental Association, is to create a national umbrella for the charitable dental education, screening, prevention, and comprehensive treatment programs already in. The initiative also provides a framework for identifying, cataloging, and recognizing the many access programs that take place throughout the year.

<http://www.ada.org/public/news/gkas.asp>

National Institute of Dental and Craniofacial Research: Children's Oral Health (NIDCR)

The website for the National Institute of Dental and Craniofacial Research (NIDCR) includes patient education materials in English and Spanish and links to reports, clinical trials, and other research opportunities. Oral health information topics include children's oral health, developmental disabilities and oral health, fluoride, and caries and cavity prevention.

<http://www.nidcr.nih.gov/HealthInformation/OralHealthInformationIndex/ChildrensOralHealth/>



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Oral Health: Reducing Barriers (AMCHP 2002 Session)

This session of the 2002 Association of Maternal and Child Health Programs (AMCHP) Conference examines barriers to oral health care services and initiatives to address disparities including, new oral health databases and needs assessment models, Congressional proposals and partnering strategies.

http://www.uic.edu/sph/cade/amchp2002/frame_tues.htm

Continuing Education

Early Childhood Caries: A Medical & Dental Perspective

Early childhood caries: a medical and dental perspective [online]. Phoenix AZ: Center for Health Professions, Phoenix College. 2003.

This on-line course is co-sponsored with the Arizona Department of Health Services, Office of Oral Health and the federal Health Resources & Service Administration (HRSA) and Phoenix College's Department of Dental Programs. It is been designed for dental and medical professionals and presents current information regarding early childhood caries. Topics covered include Early Childhood Caries (ECC) and its etiology, prevention strategies for children under the age of three, methods of screening for ECC, rationale and use of Alternative Restorative Technique, and fluoride varnishes. Tuition: \$30; 2 CEU. Phoenix College, Center for Health Professions. Preview available at no charge.

<http://www.pc.maricopa.edu/departments/dental/online.htm>.



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