

Chapter 3. Oral Diseases and Conditions in Young Children

Chapter Description

Oral health affects general health and vice versa. This chapter provides a brief overview of some of the more common conditions and diseases that can affect young children's oral health. Dental caries, infectious diseases, manifestations of systemic disease, soft tissue abnormalities, tooth anomalies and craniofacial syndromes are covered. This chapter is geared primarily to health professionals.

Chapter Overview

This Rural Smiles chapter is an overview of major concepts and clinical information about oral conditions in young children. While Chapter 4 focuses on specific clinical measures to prevent dental caries in young children, this chapter focuses more on approaches and resources for assessing risk factors and protective factors for oral conditions and diseases and recognizing clinical signs and symptoms at an early stage. Chapter 7 provides additional suggestions for public education approaches and anticipatory guidance, while Chapter 11 shows how prevention, early detection, education and treatment can be combined in viable programs and clinical practice. More in-depth information, including color photos and videos, can be found in other online manuals or websites. One source is the California First 5 Oral Health Initiative website, which includes multiple avenues for increasing your knowledge about early childhood caries. Another source is [A Health Professional's Guide to Pediatric Oral Health Management](#), an online course with 7 modules. Their Chapter 3 module walks you through the oral examination process for a young child and shows photos of normal and abnormal conditions. It is mainly targeted to "non-dental" health professionals who want to increase their knowledge of oral health issues for young children. A fact sheet, [Oral Conditions in Children with Special Health Needs](#) covers various conditions, and is also targeted to health professionals.

Self-Assessment

Go to <http://www.mchoralhealth.org/PediatricOH/mod3.htm> and take the self-assessment knowledge quiz for Chapter 3 of the online course A Health Professional's Guide to Pediatric Oral Health Management. Then come back to this chapter and do the [Oral Conditions self-assessment](#) that looks more at your experience and confidence for recognizing oral health problems and referring for primary dental care or specialty care.

Oral Health and General Health

Oral health is an integral part of overall health. This is an important concept that is reflected in numerous reports and is a key message of the California First 5 Oral Health Initiative. Oral Health in America: A Report of the Surgeon General (2000) discusses the following aspects of this concept.

- The mouth reflects general health and well-being.
- Oral diseases and conditions are associated with other health conditions and affect health and well-being throughout life.
- Safe and effective measures exist to prevent many oral diseases.

The Children's Dental Health Project in Washington, DC, in their report, *The Interface Between Medicine and Dentistry in Meeting the Oral Health Needs of Young Children*, further discusses the interactions between oral health and general health, as well as social determinants and outcomes of health.

"To the extent that children's oral health problems are considered in isolation from the rest of children's health and social policy, effective solutions cannot be generated."

"Children under the age of 5 are at a seminal state vis-a-vis their physical and cognitive development. They are going through a period of life during which decisions about their health, nutrition, education, socialization, and other basic aspects of their existence are likely to have lifelong consequences. Because of this, deferral of investments in their health and welfare made during this period can often have long-term deleterious effects."

The following statements highlight possible outcomes from oral disease.

- Children who cannot verbalize or otherwise indicate that they are in pain may experience severe oral problems that go untreated.
- Chronic dental/oral pain can lead to distractibility, withdrawal, depression and deterioration of school performance; this can negatively affect self-esteem.
- Untreated dental disease can cause decreased appetite, failure to thrive and sleep deprivation.
- Compared to children from high income families, children from low-income families miss nearly 12 times as many days from school because of dental problems.

Dental Caries

The most common infectious disease of childhood is dental caries (tooth decay). It is 5 times more common than asthma and 7 times more common than hay fever. Nationally, 18% of children aged 2 to 4 already have dental caries that can be seen during a simple visual exam. Percentages are higher in certain populations, especially children from low-income families. About 25% of those are considered to be at "high risk" for dental caries

Dental caries is a chronic infectious disease that generally progresses slowly (but sometimes rapidly), usually is not self-limiting, and advances to destroy the tooth unless some form of treatment is initiated. Treatment can be "preventive" in nature if the decay process is at a stage where tooth structure can be reversed to a healthier state. The treatment is "restorative" if the diseased tooth structure is removed and replaced with a "filling." Other terms that are used to describe dental caries include:

- Primary caries: an initial area of decay on a tooth surface
- Secondary caries: decay develops around an area that already has been filled
- White spot lesion: how an initial cavity looks on the tooth (white and opaque)
- Rampant caries: rapidly advancing decay on multiple teeth; early childhood caries is one example.

Left untreated, dental caries can cause further infection, especially abscesses, cellulitis, tooth loss, and in very severe cases, or in children who are medically compromised, can be life threatening.

Important components and concepts of dental caries

"...the processes involved in dental caries are highly complex, with temporal and spatial variations, not only in the number and type of determinants involved, but also in their relative influence...such inputs as the times, lengths, frequencies, and types of sugar composition, the quality of tooth cleaning, the fluctuations in salivary flow rates and composition, and the quality and composition of biofilm are themselves so highly variable..."

Fejerskov O and Kidd EAM. Dental Caries. The Disease and its Clinical Management. Malden, MA: Blackwell Munksgaard, 2003.

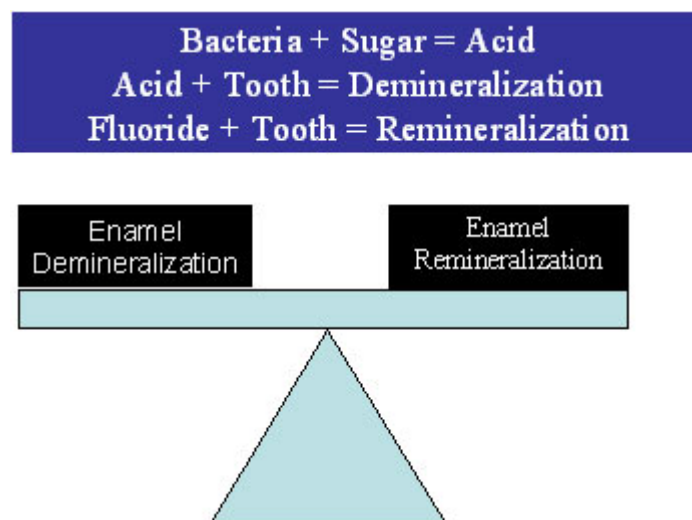
Saliva plays multiple roles in oral health and disease: helping clear food and bacteria from the mouth, protecting teeth by neutralizing acids, maintaining calcium phosphate concentrations, helping form a protective "pellicle" (film) on the tooth, defending against microbial attack. Decreased levels of saliva can result in increased rates of dental caries.

Oral microflora. Babies are born with sterile mouths but quickly acquire organisms (microflora) primarily through saliva, usually from their mothers. The diversity of this microflora increases in the first few months. As the teeth erupt, bacteria are able to attach to them and are less apt to be swept from the mouth, so large colonies are formed (plaque). As the child matures, the microflora mature and reach an equilibrium. When the equilibrium is disrupted, then disease can occur. Young children can be highly susceptible to initiation of dental caries. Cleaning the teeth, tongue and other soft tissues at least once a day in young children is important. K?hler et al, (1984) demonstrated that reducing mutans streptococci levels in mothers can prevent transmission to their infants.

Microhabitats. There are various habitats for bacteria to live in the mouth:

- Mucosa (e.g, palate, cheek, tongue): the tongue harbors many bacteria on its surface
- Tooth surfaces (smooth, pits and fissures, between the teeth): the pits and fissures are most prone to decay
- Gingival crevice: the area that forms a pocket where the gum tissue meets the tooth

Diets rich in carbohydrates, either from food or beverages, increase the growth rates of many oral microflora, and can also create an acidic environment that fosters the decay process. Formula, breast milk, and other milk products can also create an acidic environment. Chemical interactions occur between teeth and saliva. These interactions can cause demineralization of the tooth structure, but also allow use of substances such as fluorides to prevent or reverse this process. The following figure shows the balance between tooth demineralization and mineralization, and some of the factors that tip the scale.



Tooth Disorders

Teeth can display a number of variations that are caused by genetic or environmental influences during tooth formation. Most are cosmetic concerns, while others (such as multiple missing or misshapen teeth) may cause functional problems with eating or clear speech.

- Number: Some children may have supernumerary teeth (extra teeth) or may be missing one or more teeth.
- Size: tooth size is largely genetic, but small teeth or fused teeth can also result from interrupted formation.
- Shape: either the crown (visible part of the tooth) or the root can experience anomalies.
- Structure: the enamel (outer layer) of the tooth is sensitive to environmental influences (e.g., infection, trauma) during formation. Two common conditions are hypoplasia (pits on the surface) and hypocalcification (whitish spots).
- Color: color changes can occur from intrinsic stains (inside the tooth structure) such as blood-borne pigments, drugs (e.g., tetracycline), anemia and other situations, or as extrinsic stains (on the tooth surface) from iron supplements, bacteria, food, etc. Extrinsic stains can be removed.
- Eruption patterns: primary and permanent teeth generally erupt in a usual sequence and timeframe. View an [eruption chart](#). There can be wide variations, however, some of which may require orthodontic care.

Soft Tissue Problems

The soft tissues inside the mouth can reflect infections as well as signs of systemic diseases or disorders. Children with HIV can show oral manifestations, mostly opportunistic infections (yeast) and

other indications of a compromised immune system. Children with blood disorders and dyscrasias can have problems with oral bleeding. As teeth are erupting, cysts can form with an accumulation of blood, making a small bluish sack above the erupting tooth. The dentist may create a small opening for the tooth so that the tooth eruption cycle is not interrupted. If teeth or soft tissues become infected or diseased, an abscess can occur. If dental in origin, the tooth may be tender to pressure, painful and slightly mobile. Soft tissue abscesses generally resemble small, soft, red or yellow nodules with pus and may be tender. They can occur from infection of the pulp of the tooth or a foreign object. Both types can progress rapidly to cellulitis and can affect any developing permanent teeth. The infection must be eliminated and antibiotics will usually be recommended.

Herpes is a very common viral disease that is characterized by multiple vesicles on the tongue, lips and gum tissue that rupture and form ulcers that are painful and bleed easily. They go away after 7-10 days, but can recur periodically throughout life, usually as single lesions on the lips or corners of the mouth. In children, the goal is to control fever, pain, and transmission to others and to prevent dehydration with increased intake of fluids. Oral lesions from the virus that causes chickenpox are also common. If children have been sexually abused, sexually transmitted diseases may appear in the mouth and need to be treated. Candida (yeast) infections in newborns or infants appear as white clusters on the tongue or palate that bleed if scraped. Antifungal agents are generally recommended.

The sensitive tissues of the mouth can also react to allergens (e.g., food, chemicals) with local or diffuse reddening, ulcerations and there may be a burning sensation or pain. The goal is to identify and eliminate the allergen; sometimes topical medications are used to alleviate pain. Ulcers can also form from chemical sources (cleaning fluids), thermal (hot foods or beverages), electrical (electric cord burns) or mechanical injuries (trauma from an object). They can be single red or yellow lesions of different sizes and shapes, most often on the tongue, cheeks, lips and palate. If not severe, medications for symptomatic relief are given, and the lesions heal fairly rapidly.

Unintentional injuries are common in children, especially from falls, and can cause contusions and injuries to both the soft and hard tissues of the face and mouth. A good reference to learn how to handle dental emergencies is the Physician's Guide to Dental Emergencies, (order for \$20 + tax through the Dental Health Foundation website, <http://www.dentalhealthfoundation.org>.)

Craniofacial Syndromes And Other Genetic Disorders

A number of disorders can occur at birth that have accompanying oral and dental implications. The most common one is cleft lip and/or palate, which affects about 1 out of 600 live births for whites and 1 out of 1,850 live births for African Americans. Down Syndrome children have facial abnormalities, changes in tooth shape and are more susceptible to gingival infections. Children with Fragile X syndrome also have facial bone and tooth abnormalities. To learn more about other syndromes and genetic disorders, refer to some of the pediatric dentistry references in the Resources section.

Risk Assessment

In the discussion on dental caries, you learned that dental caries occurs when the environment in the mouth goes out of equilibrium to one that initiates the process of demineralization. The equilibrium state has been referred to as the "caries balance", when pathological factors and protective factors are equal (Featherstone, Feb 2003). Assessing what factors might push the equilibrium out of balance in any particular child is called "risk assessment". Major risk factors and protective factors for children ages 0-5 are listed in the boxes. Children with special health needs may have additional risk factors based on their specific medical diagnoses. Work closely with caretakers and healthcare providers to identify these factors. The factors can be used to create individual care plans for children and to develop a profile of specific groups of children to plan the best community-based prevention programs and allocate resources for clinical dental care. Chapter 11 puts risk assessment into the context of a total infant/child oral health program.

Risk Factors for Dental Caries

- Caretaker has untreated decay
- Reduced salivary flow
- Frequent ingestion of fermentable carbohydrates
- Less than optimal fluoride
- Significant bacterial challenge

Protective Factors for Dental Caries

- No previous caries
- Normal salivary flow and consistency
- Balanced diet low in fermentable carbohydrates and acidic beverages
- Optimal fluoride use
- Low bacterial challenge

- Poor oral hygiene care
- Use of antimicrobials
- Good oral hygiene care

A number of risk assessment forms have been developed, and recommendations/policies made for roles that health professionals, dental professionals, caregivers and others might play in this process. Refer to the following resources for specific information:

- American Academy of Pediatrics. Policy on Oral Health Risk Assessment Timing and Establishment of the Dental Home: <http://aappolicy.aappublications.org/cgi/content/full/pediatrics;111/5/1113>
- American Academy of Pediatric Dentistry. Risk Assessment Policy and Tool: <http://www.aapd.org/pdf/policycariesriskassessmenttool.pdf>
- Chapter 2 of A Health Professional's Guide to Pediatric Oral Health Management: <http://www.aapd.org/pdf/policycariesriskassessmenttool.pdf>
- Featherstone JDB et al. Caries management by risk assessment: Consensus statement, April 2002. CDA Journal. 31(3):257-69, 2003. <http://www.cdafoundation.org/journal/jour0303/consensus.htm>
- Oral Health Red Flags Checklist, Kids Get Care program, Seattle, WA, <http://www.metrokc.gov/health/kgc/redflags-checklist.doc>, designed for teachers, caretakers, childcare workers, etc.

Note that some of these tools primarily address dental caries rather than the other oral diseases and conditions, because caries is the biggest oral health problem in young children. Programs should not ignore the other oral problems such as soft tissue infections and oral injuries, however. Questions about these factors can be incorporated into a risk assessment. The reference [Bright Futures in Oral Health](#) provides examples of risk assessment for some of these other conditions. The rest of the publication includes questions to use as well as recommendations for counseling and follow-up. (This publication will be undergoing updates in the near future to reflect the ever-changing science base.)

Summary

Key messages from this chapter are:

1. Dental caries is a transmissible bacterial infection.
2. Risk assessment can help identify what risk factors and protective factors exist, and how they might be used to prevent, reverse or reduce dental caries in young children.
3. Soft tissues in the mouth can reflect more general infections, signs of systemic diseases, or reactions to allergens.
4. Disorders of teeth can be reflected in changes in number, size, shape, structure, color or eruption patterns.
5. A number of congenital or genetic disorders have accompanying oral and dental manifestations.
6. Health professionals can play an important role in helping to prevent and treat oral diseases and conditions in young children.

Resources

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Evaluation

What did you learn or accomplish as a result of reading this chapter? Do you have a better feeling for how oral health is an integral part of overall health? Were the resources and examples helpful? Complete the [feedback form](#) and tell us what was useful and not useful for you.