

# Pediatric Oral Health





# Educational Objectives



- Describe normal tooth development and eruption.
- Discuss the etiology and consequences of dental decay.
- Recognize the various stages of dental decay.
- Assess a child's risk of developing dental decay.
- Be able to implement prevention of dental decay through use of fluoride, proper hygiene, diet, and appropriate dental referral.



# Tooth Development



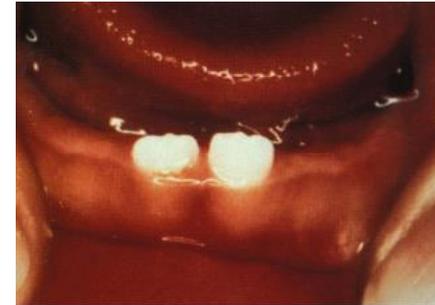
- Primary
  - > Initiation begins 6 weeks in utero
  - > All initiated by 20 weeks in utero
  - > Calcification of primary in utero
  
- Permanent
  - > Initiation begins 4 months in utero
  - > Calcification of permanent molars begins at birth
  - > Other permanent teeth calcify after birth

# Primary Tooth Eruption

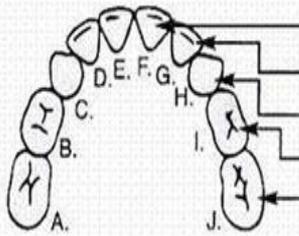


The typical pattern of primary tooth eruption:

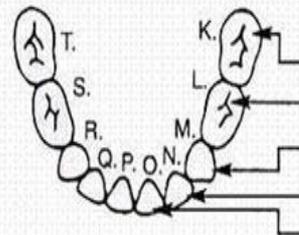
1. Lower central incisors
2. Upper central incisors
3. Lateral incisors
4. First molars
5. Canines (cuspid)
6. Second molars



**PRIMARY DENTITION**

	Upper Teeth	Erupt	Exfoliate
	Central incisor	8-12 months	6-7 years
	Lateral incisor	9-13 months	7-8 years
	Canine (cuspid)	16-22 months	10-12 years
	First molar	13-19 months	9-11 years
	Second molar	25-33 months	10-12 years

	Lower Teeth	Erupt	Exfoliate
	Second molar	23-31 months	10-12 years
	First molar	14-18 months	9-11 years
	Canine (cuspid)	17-23 months	9-12 years
	Lateral incisor	10-16 months	7-8 years
	Central incisor	6-10 months	6-7 years

- Around 9-16 months



- Around 16-22 months



**Around 2 years**



**Around 3 years**



# Teething: What's the deal?



- Restless and Increased irritability
- Increased saliva and drooling
- Putting hands or fingers into mouth
- Sore gingival tissue
- Loss of appetite and GI disturbances
- Fever > Elevated temperature and rashes probably due to some other cause



# Teething: What's the deal?



- Treatment of symptoms includes oral analgesics and chilled rings
- Use of topical anesthetics, including over-the-counter teething gels, to relieve discomfort are discouraged due to potential toxicity



# Epstein's Pearls, Bohn's Nodules and Dental Lamina Cysts



- About 3/4 of newborns may have small white or grayish white bumps in their mouths.
- They may sometimes be mistaken for erupting baby teeth.
- These are actually tiny fluid-filled cysts that can be on the roof of the mouth or on the gums.
- They usually disappear within a few weeks after birth.



# Natal and Neonatal Teeth



# Eruption Hematoma



- Bluish-purple bump can develop in the area where the new tooth is erupting
- Usually develops a few weeks before eruption, may be filled with blood, and is usually seen in the eruption of the molars
- Is not serious and usually subsides within a few days after the tooth breaks through the surface

# Ectopic Eruption



# Bruxism



- Two to three out of every 10 kids will grind or clench, but most outgrow it
- Habitual grinding of teeth is common with children with cerebral palsy or severe intellectual disability
- Bruxism may lead to:
  - enamel loss (tooth wear)
  - difficulty with chewing
  - tooth sensitivity
  - headaches
  - pain,
  - gum disease

# Tooth Anomalies



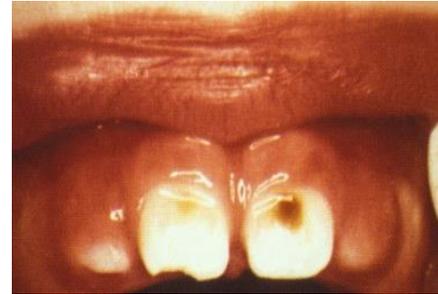
- Number (extra, missing)
- Size (micro-, macro-)
- Shape (malformed)
- Color
- Developmental defects (pits, lines or discoloration)
  - May increase risk of caries



# Enamel Hypoplasia and Enamel Demineralization



- Children with low birthweight, developmental delays, or certain genetic syndromes may be at increased risk for enamel hypoplasia, especially in the maxillary incisors and primary molars.
- Hypoplasia usually appears on the middle or occlusal third of the teeth
  - Pits
  - Lines
  - Discoloration



# Primary Gingivostomatitis (Primary Herpes)



- Initial infection will often include a fever, irritability, and blisters or sores in or around the mouth.
- Some children only have one or two mild sores inside the mouth
- After this phase passes, the virus usually lies dormant for months or years and reappears during periods of physical or emotional stress.
- Anti-virus medications can be prescribed if the sores spread and interfere with feeding.



# Aphthous Ulcers



- Characterized by small (usually 1-5 mm) lesions that heal without scarring
- Unknown etiology, but they may be infectious, autoimmune, allergic, nutritional, or traumatic
- Treatment includes supportive care, bland diet (avoid spicy and citrus), or mouth rinses.

# Plaque and Gingivitis





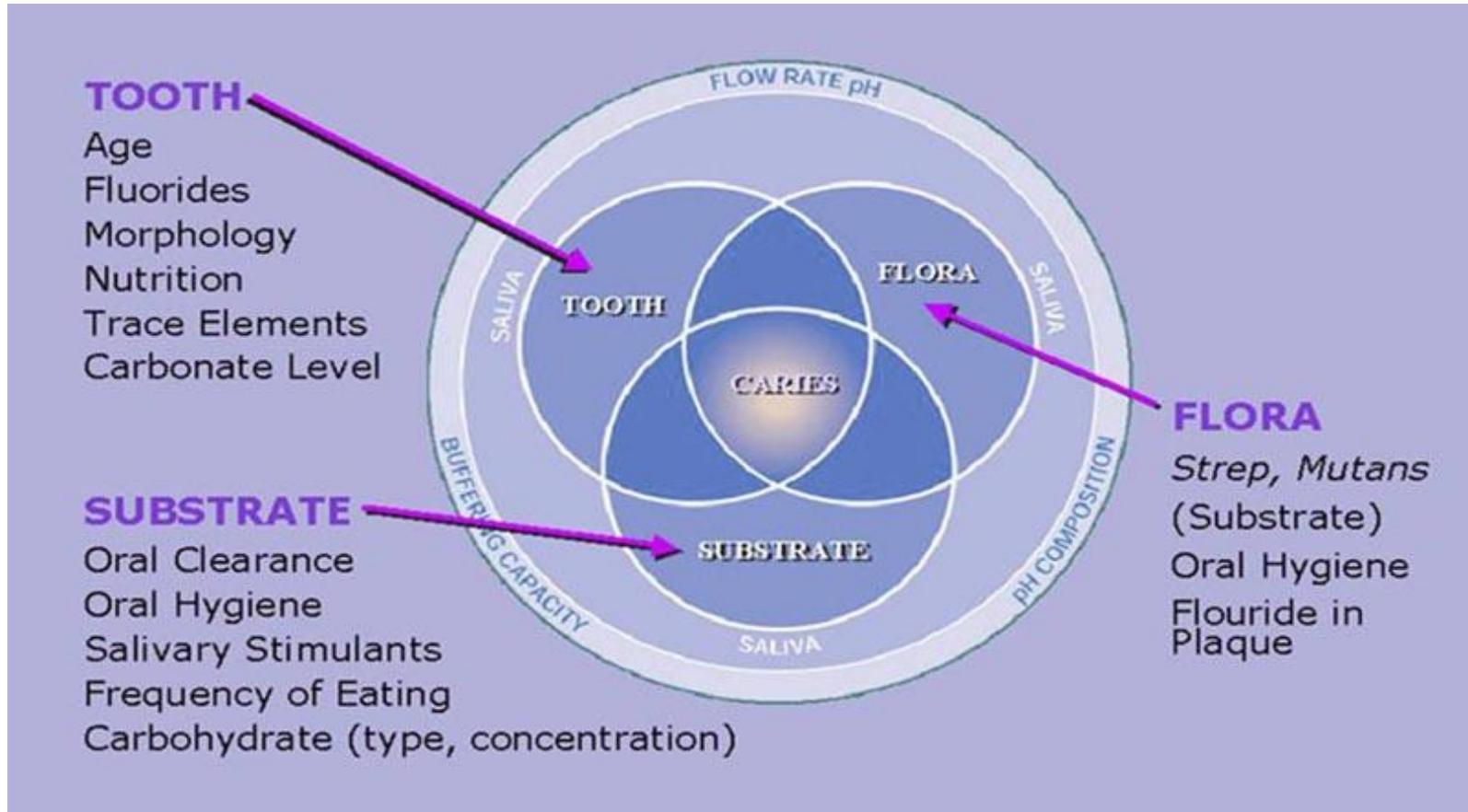
# Dental Caries



- Infectious, communicable disease resulting in destruction of tooth structure by acid-forming bacteria found in dental plaque, an intraoral biofilm, in the presence of sugar...*and which can be remineralized.*
- Dental caries is the most common chronic disease in childhood.
  - Is five times more common than asthma.
- 30 to 50 % of low income children have ECC.
- Of the 4 million children born each year, more than half will have cavities by the time they reach second grade.

# Etiology: The Triad

## What Causes Dental Caries?



# Etiology: Teeth



- The cells that manufacture enamel are very sensitive to systemic insults.
- Disruption of enamel will result in enamel defects
  - Defects may appear as changes in translucency, color, or texture.
- It may be difficult to distinguish enamel defects from early clinical signs of caries

# Healthy teeth

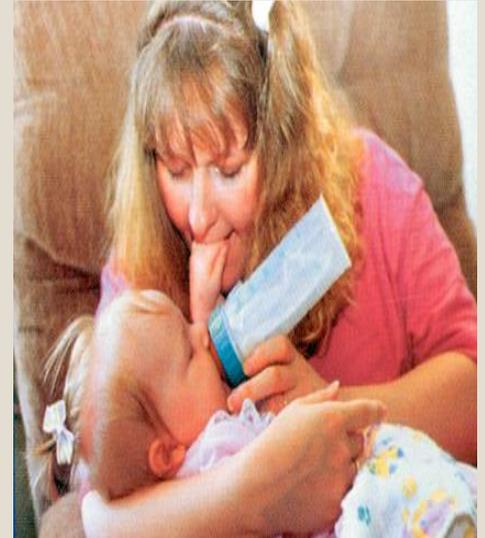


- Healthy teeth should be a creamy white with no signs of deviation in color, roughness, or other irregularities.

# Oral Bacteria



- Initiated by pathogenic bacteria—*Streptococcus mutans* (MS)
- MS colonization of an infant may occur from the time of birth.
- Significant colonization occurs after dental eruption
- Earlier child colonized, the higher the risk of caries



# Transmission of S. Mutans



- Vertical: from primary caregiver to child (mother most often)
- Horizontal: Siblings of similar age; other children in daycare center
- Indirect Transmission
  - food/drink
  - utensils
  - toothbrushes
  - Blowing on or pre-chewing food

## Substrate:

**It's not just WHAT, but HOW, children eat:**



- Carbohydrates break down to sugar.
- Oral bacteria produce acids that persist for 20–40 minutes after sugar ingestion.
- Oral acids lead to enamel demineralization.
- Frequent snacking promotes acid attack.
  - If sugars are consumed frequently, there is insufficient time for the remineralization process to occur and the tooth is subjected to continued demineralization and the caries process progresses.

# Substrate



- Complex carbohydrates (breads, cereals, pastas) are major sources of “hidden” sugars.
- High sugar content in sodas.
- Not just what you eat But how you eat!
- Frequency of sugar ingestion is more important than quantity.

# Substrate



- The AAP and AAPD strongly endorse breastfeeding.
- Although breast milk alone is not cariogenic, it may be when combined with other carbohydrate sources.
- For frequent nighttime feedings with anything but water after tooth eruption, consider an early dental home referral.

# Early Childhood Caries (ECC)



- Severe tooth decay affecting young children (< 6 years of age)
- Affects teeth (Upper front) that erupt first and are least protected by saliva
- Mandibular incisors, although they erupt first, are generally not affected because they are protected by the tongue and pooling of saliva in that area

# Early Childhood Caries



- Inappropriate bottle feeding with milk
- Ad libitum breast-feeding
- Diet of predominantly carbohydrates
- Improper oral hygiene
- At will Sippy cup



# White Spots: The Early Stage of ECC

- Caries typically affects the teeth that erupt first and are least protected by saliva.
- White spots/white lines typically begin at the gingival margin.
- If the disease process is not managed, the lesions will progress and the demineralized enamel will break down to frank cavities that initially appear pale yellow.
- In time, they will progress to larger brown cavities.

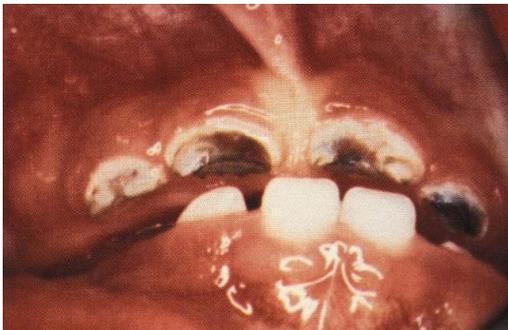


# White Spots Progress to Brown Cavitations



- Anterior upper incisors are most typically first affected as posterior teeth have not yet erupted.
- Lesions are initially pale yellow and become progressively darker as they become stained with pigments from food.
- The brown cavitations represent areas where loss of enamel has exposed underlying dentin
- Teeth may be sensitive to thermal changes and sweet or sour foods or drinks.

# Dental Caries



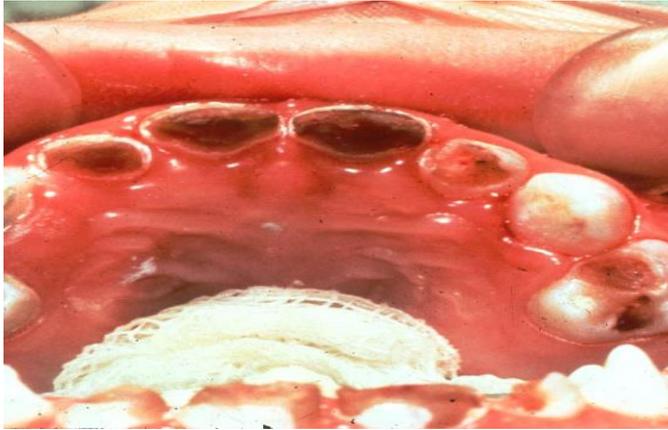
# Dental Caries



# Dental Caries



# Dental Caries Consequences



- Extreme pain
- Spread of infection
- Difficulty chewing, poor weight gain
- Difficulty sleeping
- Extensive and costly dental treatment
- Risk of dental decay in adult teeth
- Malocclusion

# Dental Caries Consequences



- Missed school days
- Impaired language development
- Inability to concentrate in school
- Reduced self-esteem and social interaction problems
- Possible facial cellulitis requiring hospitalization
- Possible systemic illness for children with special health care needs

# Dental Alveolar Abscess



# Facial Cellulitis



# Oral Health Risk Assessment



- AAPD supports that appropriate oral health assessment should begin within 6 months of the eruption of the first tooth and certainly by the first birthday
- Screening of the lips, tongue, teeth, gums, inside of the cheeks, and roof of the mouth
- Identifying an infant's or child's risk or protective factors that may impact oral health.
- **Dental Home should be established by 1 year of age**

# The Dental Home



- “The dental home is the ongoing relationship between the dentist and the patient, inclusive of all aspects of oral health care delivered in a comprehensive, continuously accessible, coordinated, and family-centered way.”
- Establishment of a dental home begins no later than 12 months of age and includes referral to dental specialists when appropriate. (AAPD Definition)
- Children with dental home are more likely to receive appropriate preventive and routine oral health care.

# Caries Risk Assessment



**Table 1. Caries-risk Assessment Form for 0-5 Years Old<sup>24</sup>**

Factors	High risk	Moderate risk	Low risk
<i>Risk factors, social/biological</i>			
Mother/primary caregiver has active dental caries	Yes		
Parent/caregiver has life-time of poverty, low health literacy	Yes		
Child has frequent exposure (>3 times/day) between-meal sugar-containing snacks or beverages per day	Yes		
Child uses bottle or non-spill cup containing natural or added sugar frequently, between meals and/or at bedtime	Yes		
Child is a recent immigrant		Yes	
Child has special health care needs		Yes	
<i>Protective factors</i>			
Child receives optimally-fluoridated drinking water or fluoride supplements			Yes
Child has teeth brushed daily with fluoridated toothpaste			Yes
Child receives topical fluoride from health professional			Yes
Child has dental home/regular dental care			Yes
<i>Clinical findings</i>			
Child has non-cavitated (incipient/white spot) caries or enamel defects	Yes		
Child has visible cavities or fillings or missing teeth due to caries	Yes		
Child has visible plaque on teeth	Yes		

Circling those conditions that apply to a specific patient helps the practitioner and parent understand the factors that contribute to or protect from caries. Risk assessment categorization of low, moderate, or high is based on preponderance of factors for the individual. However, clinical judgment may justify the use of one factor (e.g., frequent exposure to sugar-containing snacks or beverages, more than one decayed missing filled surfaces [dmfs]) in determining overall risk.

Overall assessment of the child's dental caries risk: High  Moderate  Low

# Positioning Child for Oral Health Risk Assessment



- Position the child in the parent's lap facing the parent.
- Sit with knees touching the knees of parent.
- Mom or dad should control child's hands.
- Feet need to be safely past parents body
- Lower the child's head onto your lap.
- Lift the lip to inspect the teeth and soft tissue.

# Exam



- Lift the lip to inspect the teeth and soft tissue.
- Assess for:
  - Presence of plaque
  - Presence of white spots or dental decay
  - Presence of tooth defects (enamel)
  - Presence of dental crowding
- Provide education on brushing and diet during examination.

# Oral Health: Prevention



- All infants should have their mouths cleansed with a damp cloth after feedings.
- Start twice daily brushing when first tooth erupts
- Clean with washcloth, then soft nylon brush & small smear of fluoridated toothpaste < age 3.
- Parent should floss between the child's teeth once every day as soon as teeth contact one another.



# ORAL HYGIENE



- Adult should brush child's teeth until they have developed the manual dexterity to write in cursive and tie their shoes, which usually occurs around age six - eight.
  - Parents should continue to intermittently supervise brushing after children assume independence.
- Child should spit out, not rinse, after brushing to increase topical fluoride exposure.
- Nothing to eat or drink after brushing at night
- Nighttime is most important time to brush

# Toothpaste



- To age 3 years: small smear amount of toothpaste (size of grain of rice)



- 3 years and older: A small pea-sized amount of toothpaste



Parents should keep toothpaste tubes out of reach of small children

# Tooth Brushing



- Children should lie in adult's lap or stand in front of adult, both facing same direction
- Lift lip to brush gumline
- Brush behind teeth

# Flossing



- Once a day (preferably at night)
- Whenever any 2 teeth touch



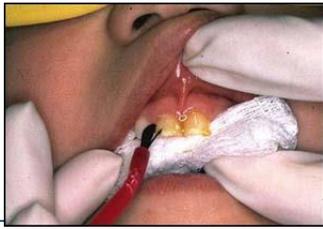
# Fluoride



Child's Age	Water Fluoride Concentration		
	< 0.3 ppm	0.3 – 0.6 ppm	> 0.6 ppm
6 mos – 3 yrs	0.25 mg	None	None
3 yrs – 6 yrs	0.50 mg	0.25 mg	None
> 6 years	1.00 mg	0.50 mg	None

Dosages are in milligrams F/day

- Supplementation by prescription for children at high caries risk who do not have access to optimally fluoridated water is recommended by the AAP, AAPD, and CDC.
- Supplementation is not recommended for breast feeding infants or formula fed infants until age six months.
- If the fluoride content of the main water used for cooking and drinking cannot be determined, then supplemental fluoride should NOT be prescribed.
- In optimally fluoridated communities where children drink bottled water, supplements should NOT be prescribed due to halo effect.



# Fluoride Varnish



- Professionally applied, highly concentrated (22,600 ppm) topical fluoride product that has been widely used in Europe and Canada as a dental caries prevention agent for greater than 30 years.
  - In US, FDA approved as cavity liner and for treatment of hypersensitivity.
- Proven to be effective in preventing dental decay in both primary and permanent teeth and can also reverse early caries lesions (white spot lesions).
- Most studies have shown 25-45% reductions in the decay rate
- Covers the teeth with an adherent film that lasts for up to 24 hours, thereby enhancing the uptake of fluoride ions into the tooth surface.

# Thank You!

