

Chapter 12

Dentistry

Caries

- Dental caries is a transmissible infectious disease
 - Transmitted vertically (caregiver to child)
 - The most prevalent chronic infectious disease of childhood
- Early childhood caries is defined as decay that occurs within the first 71 months of life
 - The American Academy of Pediatric Dentistry and the American Academy of Pediatrics recommend that a child's first dental visit occur upon eruption of the first tooth and no later than 12 months of age (Figure 12-1)

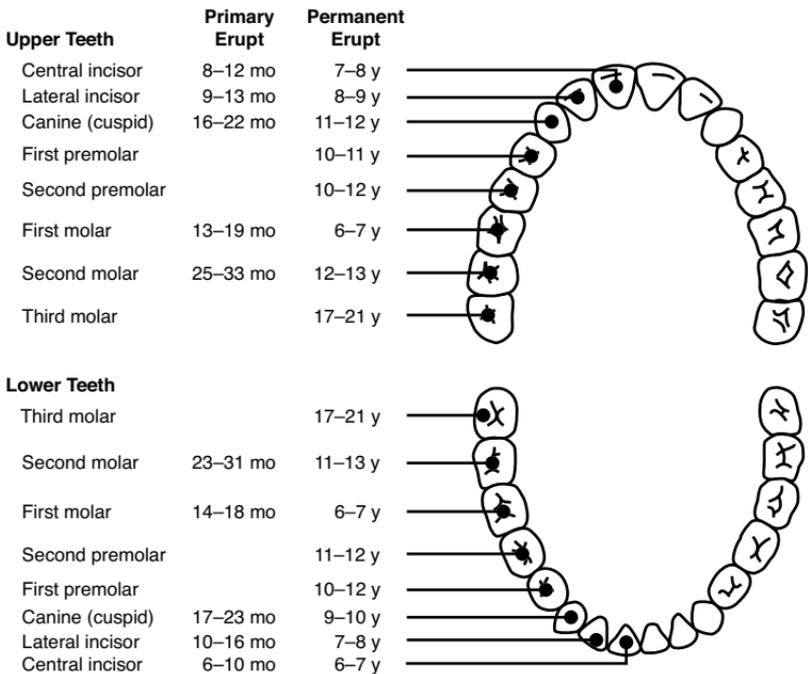


Figure 12-1. Diagram of tooth eruption sequence by age.

- There is wide variance in the eruption age of primary and permanent teeth; however, primary teeth usually erupt between 6 months and 2½ years, with the mandibular incisors erupting first. Permanent mandibular incisors erupt around 6 years of age, and permanent teeth continue until eruption of the third molars between 17 and 21 years of age
- In the past, tooth decay was primarily associated with industrialized countries and diets high in processed sugar. However, the availability of processed sugar in developing countries is on the rise, with a concomitant increase in the incidence of dental caries. This is a particular problem in developing countries because access to dental care is extremely limited and costly. Using bottles and “sippy” cups with juice or milk for long periods of time can put children at high risk for caries, especially in the maxillary anterior teeth. This is particularly true if children are given the bottles or cups when they are put in bed and allowed to fall asleep while holding them in their mouths. Frequent consumption of snacks and drinks containing fermentable carbohydrates (eg, juice, milk, formula, soda) can also increase a child’s caries risk

Fluoride

- Systemic fluoride supplementation should **only** be considered in children in drinking fluoride-deficient water (< 0.6 ppm) and when a complete dietary history is available (Table 12-1)

Table 12-1. Recommended Fluoride Dosages According to Fluoride Ion Level in Drinking Water

Age	Fluoride Ion Level in Drinking Water (ppm*)		
	< 0.3	0.3–0.6	> 0.6
	Amount of Fluoride to Prescribe		
0–6 mo	None	None	None
6 mo–3 y	0.25 mg/day†	None	None
3–6 y	0.50 mg/day	0.25 mg/day	None
6–16 y	1 mg/day	0.50 mg/day	None

*1 ppm = 1 mg/L.

†2.2 mg sodium fluoride contains 1 mg fluoride ion.

- Many areas with well water have natural fluoride
- Well water must be tested prior to prescribing fluoride supplementation
- The lethal dose of fluoride is 30–36 mg/kg in a single dose. The probable toxic single dose of fluoride is 5–10 mg/kg of body weight. Toxicity begins with gastric signs and symptoms
- Over-the-counter toothpaste has approximately 1 mg of fluoride per 1 inch
- Improper fluoride supplementation often leads to fluorosis of permanent teeth, which makes them more prone to dental decay
- Professional applications of fluoride, especially in high-concentration varnishes, have proven safe and effective for reducing dental decay

Toothache

- Toothaches are most frequently caused by dental caries or trauma
 - If dental caries involves the inner pulp of the tooth, the infection may progress to an irreversible pulpitis or abscess and may require tooth extraction
 - If dental caries does not directly involve the tooth's inner pulp (reversible pulpitis), it may be treated by debridement of the decay and placement of intermediate restorative material (IRM)
 - Temporary toothache pain caused by hot or cold stimuli is an indication of reversible pulpitis amenable to treatment with IRM; spontaneous, severe toothache of longer duration or severe pain that wakes the patient up at night are signs of irreversible pulpitis requiring tooth extraction if follow-up root canal care is unavailable
- Emergency treatment of dental caries and reversible pulpitis is as follows:
 - Gently remove as much visible decay as possible
 - Mix and place IRM, which contains eugenol to reduce pain, into the cavity
 - For severe deep caries with associated pain that obviously extends to the inner pulp, extract the tooth

- Local anesthetic for palliative care of toothache pain (also for extraction; see “Extraction Basics”) is as follows:
 - ▶ 2% lidocaine with or without 1:100,000 epinephrine; maximum dose 4.4 mg/kg
 - ▶ 0.5% bupivacaine for long-acting local anesthesia; maximum dose 1.3 mg/kg
 - ▶ Use either local infiltration (Figure 12-2) or inferior alveolar nerve block
 - ▶ Always aspirate before injecting
 - ▶ Posttreatment, self-inflicted lip and tongue trauma are common from a child sucking or chewing on an anesthetized lip or tongue; posttreatment observation of the anesthetized child is required



Figure 12-2. Local infiltration anesthesia.

Dental Abscess

- Abscesses may be localized or involve facial spaces
- Definitive treatment consists of extracting the offending tooth
- If the tooth cannot be extracted and intraoral swelling is present, use an 18-gauge needle and syringe to aspirate purulent material or incise and drain with a #15 scalpel
- Antibiotics are usually not indicated after extracting a primary tooth with localized swelling because the source of the infection is no longer present. For larger, diffuse swelling or cellulitis, antibiotics can be prescribed as follows:

- Mild to moderate infection: clindamycin (10 mg/kg/day) orally every 6 hours for 7 days; amoxicillin (50 mg/kg/day) orally every 6 hours for 7 days
- Severe infection: clindamycin (20 mg/kg/day) intravenous (IV) every 6 hours for 7 days
- Hospitalization is indicated for severe trismus, dehydration, descending neck infection, inability to protrude tongue, and swelling involving the eye orbit

Extraction Basics

- Indications for extraction include severe tooth pain, abscess, severe periodontal (gum) disease, and traumatic injuries
- Anterior teeth have single roots, premolars have one or two roots. Maxillary molars usually have three roots, mandibular usually have two
- Technique:
 - If possible, take a radiograph to look for multiple roots or root fracture
 - Anesthetize the area
 - Use a 301 Apexo elevator (Hu-Friedy, Chicago, Ill) to loosen the selected tooth (Figure 12-3)
 - Firmly grasp the tooth with the forceps beak under the gingival margin. For anterior teeth, use a screwdriver-type



Figure 12-3. A 301 elevator may be used to loosen selected tooth.

(rotating) motion to extract the tooth; for posterior teeth (premolars and molars), with a firm grasp, roll the forceps in a facial direction to extract the tooth (Figure 12-4)

- If a root fractures during extraction, leave it in place if it cannot be easily removed



Figure 12-4. Roll the forceps in a facial direction to extract tooth.

Trauma

- Check tetanus status. Neurological examination is required if there is trauma to the head or face
- Primary teeth may darken when traumatized, but this is not necessarily indicative of their prognosis; they often return to their original color within 6 to 9 months
- Include abuse as part of the differential diagnosis
- **Fractured tooth**
 - Enamel fracture only: smooth with file
 - Enamel and dentin fracture: apply protective filling material (IRM or dental composite)
 - Fracture to tooth pulp: apply protective filling material (IRM or dental composite)
- **Avulsed tooth**
 - A primary tooth should never be reimplanted. When primary teeth are apically displaced (straight down into the tooth socket) from trauma, they often reerupt in the correct position; primary teeth displaced other than apically will not reerupt in the correct position

- Reimplant a permanent tooth within 2 hours of the incident. Avulsed permanent teeth reimplanted within the first hour have a greater chance of a successful outcome; after that the chance of complication increases. Because of the high likelihood that extensive treatment (eg, root canal) will be needed following reimplantation, permanent teeth should only be reimplanted if the patient has access to good follow-up care
- Reimplantation technique:
 - ▶ Do not scrub the tooth; lightly rinse it with saline to remove debris
 - ▶ Store the tooth in milk or balanced saline solution if reimplantation will be delayed
 - ▶ Radiograph the area if possible
 - ▶ Reimplant the tooth as soon as possible
 - ▶ Stabilize the reimplanted tooth with flexible wire (0.018 inch) for 1 week. The wire can be bonded with composite dental material to the adjacent teeth and the injured tooth
 - ▶ Check the occlusion of reimplanted teeth with opposing arch (ensure reimplanted teeth do not interfere when the patient bites teeth together)
 - ▶ Prescribe antibiotics for 7 to 10 days following a traumatic avulsion (Figures 12-5–12-8)



Figure 12-5. Severely displaced maxillary incisors.



Figure 12-6. Repositioned maxillary incisors (always check occlusion with mandibular teeth).



Figure 12-7. Splint made of flexible orthodontic wire (0.018 inch) bonded with composite.



Figure 12-8. Maxillary incisors after splint removal.

Oral Pathology

- **Primary herpetic gingivostomatitis** (Figures 12-9 and 12-10)



Figure 12-9. Primary herpetic gingivostomatitis on inner surface of cheek.

Photograph courtesy of Harvey P Kessler, DDS, MS, Baylor College of Dentistry.



Figure 12-10. Primary herpetic gingivostomatitis on ventral surface of tongue.

Photograph courtesy of Harvey P Kessler, DDS, MS, Baylor College of Dentistry.

- Manifests with multiple vesicles or ulcers on lips, gingiva, and palate
- Patient is febrile, often dehydrated, irritable, and lethargic
- Antiviral medications are only effective in reducing the duration of infection if they are given within the first few days of the outbreak
- Hydration is essential. Oral hydration is usually sufficient; however, IV hydration is required for severe infections
- Do not give topical medications (eg, viscous lidocaine) to patients who are unable to expectorate; lidocaine overdoses have been reported
- Palliative treatment may be accomplished with acetaminophen or ibuprofen
- Continue implementing oral hygiene practices as much as possible
- **Aphthous ulcers** (Figure 12-11)



Figure 12-11. Aphthous ulcer.

- Painful oral lesions located on unattached oral mucosa; red halos with pale centers that occur in fewer numbers than with herpetic gingivostomatitis
- Causes include allergic or immunological response or

- streptococci infection
- Treatment is palliative. Lesions usually disappear in 10 to 14 days without treatment
- For pain, administer benzocaine topical dressing twice daily or chlorhexidine gluconate 0.12% oral mouth rinse twice daily. Amoxicillin may be used for very large, painful lesions (50 mg/kg/day for 10 days)
- **Neonatal sublingual traumatic ulceration**
 - Ulceration on ventral portion of tongue caused by the lower incisors
 - Often seen with natal or neonatal teeth in the first several months of life
 - Can cause pain and limit an infant's breast-feeding and nutrition intake
 - Treatment: extract tooth or smooth edges of offending tooth
- **Pyogenic granuloma**
 - Localized mass, sometimes on gingiva, associated with traumatic irritation from calculus deposits
 - Treatment: remove calculus; lesion will disappear with the removal of the cause
- **Other pathology**
 - In addition, noma—an opportunistic, rapidly spreading oral infection related to poor hygiene and patients who are immunocompromised—and oral manifestations of human immunodeficiency virus and autoimmune deficiency disorder are more prevalent in developing than industrialized countries

