PEDIATRIC EMERGENCY DEPARTMENT CLINICAL GUIDELINE: DENTAL TRAUMA

Epidemiology
- 30% of preschoolers suffer dental injury
  - At this age there is no difference between boys and girls.
- 23% males age 6-20 years and 13% females suffer dental injuries
- Prevalence and incidence peak at 2-4 years and 8-10 years
- The way the tooth is injured is related to the activity level at each age.
  - Patients with chronic conditions and mobility problems
  - Altercations
  - Abuse
- Most commonly injured teeth
  - Maxillary central incisors
  - Protruding teeth

History: important information to get regarding the injury
- Incidents surrounding injury
- Any other injuries
- How long ago the injury occurred
- Last time the patient ate

Physical Examination
- Extraoral
  - Inspection
    - Asymmetry
    - Nasal or orbital malalignments
    - Lacerations, hematomas, foreign bodies
    - Open and close mouth to evaluate for deviation during function
    - Lip competency
  - Palpation
    - TemporoMandibular joint
      - Equal movements
    - Orbital rim intact
    - Nose for crepitus
    - Note parasthesias or numbness
- Intraoral
  - Inspection
    - Color and quality of gums and mucosa
    - Note hematomas
    - Examine teeth
    - Color, chips, cracks, bleeding, absent
  - Palpation
    - Tongue
    - Mobility of teeth
    - Tooth percussion

Imaging
- Moderate and severe dental trauma
Principles of Management by Type of Injury

Crown Fractures

Ellis Class I
- Minor fracture of the tooth enamel
- Rarely painful
- Does not require immediate treatment
- Rough edges may need filing

Ellis Class II
- Enamel and dentin involvement
- Entry of bacteria into tooth
- Can see yellow or pink color of dentin
- Exposed dentin needs to be covered
  - Apply calcium hydroxide paste
  - Subsequent composite repair
- Antibiotics
  - Prolonged exposure
  - Dirty wound

Ellis Class III
- A true dental emergency
- Dental pulp is exposed
- Red tinge or bleeding
- Extremely painful
- Exposed pulp will become infected
  - More likely if exposed > 6 hours
- Primary tooth
  - May need to extract to prevent further injury
- Permanent tooth
  - Calcium hydroxide paste
  - Root canal for prolonged exposure
  - Antibiotics

Root Fractures
- Crown luxation, pain, excessive mobility, malocclusion
- Confirm location with radiographs
- Primary tooth
  - Extraction
- Permanent tooth
  - Splint
  - Length of splinting depends upon integrity of remaining root fragment

Periodontal Structural Injuries

Concussion
- Trauma to the supporting structures of the tooth
  - Inflammation
  - No displacement or mobility
  - Tenderness to percussion
  - No bleeding
- Management same for primary and permanent
  - No acute intervention required
  - Analgesia as needed
  - Need dental follow up to monitor tooth vitality

Subluxation


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**DENTAL TRAUMA**

- Mobility of the tooth without displacement
- Blood may be present in gingival sulcus
- Pain with percussion
- Primary Teeth
  - Mobile teeth may need splinting
  - Dental follow-up in 24 hours due to potential for pulp necrosis
  - Soft diet
- Permanent Teeth
  - Possible splinting
  - Dental follow-up in 24 hours due to potential for pulp necrosis
  - Soft diet

### Lateral Luxation

- Displacement of tooth laterally in socket
  - Buccal, lingual, labial, or lateral
  - Lingual displacement is most common
- Periodontal ligament is torn
- Usually accompanied by alveolar fracture
- Primary Teeth
  - Often no intervention necessary
    - Passive repositioning
  - Gentle repositioning
  - Splint or extraction
    - Laterally displaced or extreme mobility
  - Refer for dental follow-up
- Permanent Teeth
  - Immediate dental referral
    - Repositioning
    - Splinting

### Intrusion

- Tooth is driven into socket
  - Crown height is shortened
- Periodontal ligament is lacerated
- Bleeding usually present
- Root & alveolar fractures may occur
- Must determine if the tooth is truly intruded and not fractured
- Primary teeth
  - Less than 50% intruded
    - Will usually re-erupt in 3-4 weeks
  - If 100% intruded
    - May contact with underlying tooth bud
    - Extraction
  - Need dental follow up
    - Monitor for potential damage to underlying tooth bud
- Dental emergency
  - Urgent referral
  - Monitor for injury to root structures & neuro-vascular supply
  - Allow tooth to re-erupt
  - Re-positioning and splinting

### Extrusion

- Tooth is vertically displaced out of bony socket
- Periodontal ligament is torn
- Primary Tooth
  - Urgent dental referral
  - Extract if very mobile or nearly avulsed
- Permanent Tooth
Avulsion

- Tooth is completely detached from the socket
- Periodontal ligament severed
- Possible alveolar fracture
- Need to find the tooth!
  - Rule out aspiration/intrusion/fracture
- Determine primary vs. permanent
- Primary Teeth
  - No replacement of tooth
    - Children under 6 years of age
  - Control bleeding
  - Dental referral to evaluate potential injury to permanent tooth bud
- Permanent Teeth
  - True Dental Emergency
  - Time is essential
    - Best outcome if < 30 minutes to re-implant
  - Viability dependent upon vitality of root
  - Goal is to avoid further damage to periodontal ligament cells
  - Re-implant tooth immediately
  - If delay in re-implantation, place it in transport media
    - Hank’s Balanced Salt Solution
    - Fresh cold milk
    - Saline
    - Saliva (buccal vestibule)
    - Water
  - Minimize handling
  - Do not scrub tooth
- Extra-oral time ≤ 1 hr:
  - Rinse off debris and re-implant
  - Immediate splinting by dentist
- Extra-oral time > 1 hr:
  - Soak in Hank’s Balanced Salt Solution or dental fluoride solution for 20-30 minutes
  - Re-implant
  - Immediate splinting

Disposition

When to see the dentist immediately
- Ellis II or III
- Root Fracture
- Primary
  - 100% intrusion
- Permanent tooth
  - Luxation
  - Intrusion
  - Extrusion
  - Avulsion

When to see the dentist within 24 hours
- Ellis I
- Subluxation
- Primary
  - Lateral luxation
  - Intrusion
  - Extrusion
  - Avulsion
REFERENCES:


DISCLAIMER:
This clinical guideline has been developed for the purpose of unifying the general emergency care of infants with bronchiolitis. It is intended to aid, rather than substitute for, professional judgment. It is not intended to serve as a rigid protocol or a written proxy for the standard of care. Failure to comply with this guideline does not represent a breach of the standard of care.