Assessment and Management of Dental Trauma in Adults

SCGH Emergency Department Guidelines

Note: *this guideline covers the management of permanent teeth trauma only.*

General Principles

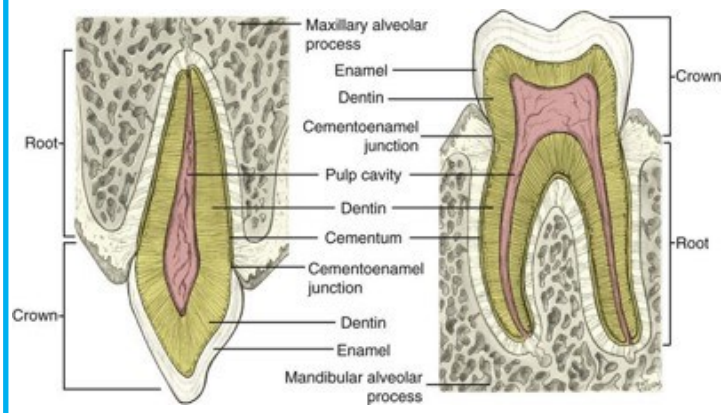
- Assess all patients who present with orofacial injuries for head injury and all patients who present with head injury for associated dental trauma.
- Check tetanus immunisation status for all patients who present with injuries that breach skin or mucosa.
- Management of avulsed permanent teeth is a time-critical dental emergency. See the separate section on management of avulsed permanent teeth.
- If there are fragments or whole teeth missing, consider doing Xrays of the cheek or lip to look for them.
- There is limited evidence for the use of systemic antibiotics in isolated dental injuries. Consider prophylactic antibiotics for associated alveolar fractures, heavily contaminated wounds or if the patient's underlying medical conditions or associated injuries warrant antibiotic coverage.
- Healing after a dental injury requires good oral hygiene. **Mouth rinses with chlorhexidine twice a day for 10–14 days** reduces the infection risk. A **soft diet** will also allow loose teeth to become firmer.
- Appropriate use of a mouthguard during sports can minimise dental trauma so use this encounter as an opportunity for patient education.

Examination

- Look for symmetry in the mouth and teeth.
- Bite for even occlusion, subjective or objective; steps in bite or bone border.
- Test temporomandibular joint movement and tenderness.
- Check for numbness, intra or extra-oral bruising.
- Lift the lips to look for gingival or oral mucosal injury.
- Discern the type of dental injury: loose or displaced tooth, fractured tooth, injury to supporting bone, injury to oral mucosa or gingivae.
- Account for all lost teeth and fragments.

  ⇒Examine chest and soft tissues of the mouth if any

Anatomy of the Tooth

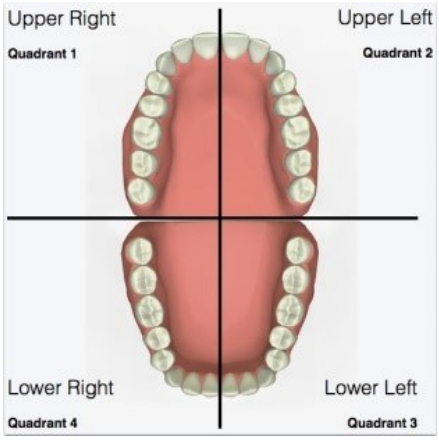


Source: Pocket Dentistry Chapter 4. Dental Anatomy

Imaging

- ***Orthopantogram (OPG)*** only if considering fractured mandible, TMJ injury, alveolar fracture or concern for fully intruded tooth.
- ***Chest x-ray*** if suspicious tooth has been aspirated.
- Other dental X-Rays (including occlusal / bite-down) views can only be done in dental clinics.

Numbering System to describe affected teeth



Permanent teeth															
Upper right (Quadrant 1)								Upper left (Quadrant 2)							
18	17	16	15	14	13	12	11	21	22	23	24	25	26	27	28
48	47	46	45	44	43	42	41	31	32	33	34	35	36	37	38
Lower right (Quadrant 4)								Lower left (Quadrant 3)							

Teeth are numbered using the system [*(quadrant) (no. from front)*]. For example, the lower left tooth 4th from the front would be **tooth 34** – **3**rd quadrant, **4**th tooth back.

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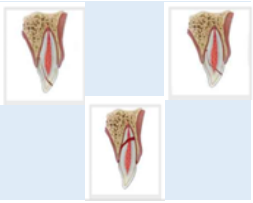
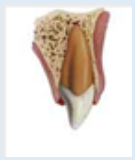
Assessment & Management of dental and supporting tissue injury

(Images source: Dental trauma guide Permanent teeth – Dental Trauma Guide)

Injury	Image	Assessment	Management
Infraction		• Incomplete fracture (crack) of the enamel without loss of tooth structure. • Not painful on percussion; if tenderness observed evaluate for possible luxation or root fracture.	• Follow up with dentist in 2 – 4 weeks. • Antibiotics not indicated.

Enamel fracture OR enamel + dentin fracture (pulp not exposed)		• Complete fracture of the enamel / visible enamel loss.
		• Not painful on percussion; if tenderness observed evaluate for possible luxation or root fracture.
			• Keep any tooth fragment in sodium chloride 0.9% or milk for possible rebonding.
			• Follow up with dentist
			  • 24 hours if fragment requires rebonding
			  • 2 – 4 weeks if no fragment requiring rebonding.
			• Antibiotics not indicated.

Enamel-dentin fracture		• Fracture of enamel and dentin with loss of tooth structure and exposure of the pulp. • Pink/red or bleeding centre is visible that is highly sensitive to cold/ hot stimulation. • Not painful on percussion; if tenderness observed evaluate for possible luxation or root fracture	• Cover with calcium hydroxide paste (Dycal®). • Keep any tooth fragment in sodium chloride 0.9% or milk for possible rebonding. • Follow up with dentist in 24 hours. • Antibiotics not indicated.
Crown-root fracture (with or without pulp)		• Crown fracture involving enamel, dentin and cementum but not exposing the pulp, extending below gingival margin. • Bleeding from gingival sulcus might be the only clue that the root of the tooth is fractured. • Painful on percussion. • Coronal fragment mobile.	• Temporary stabilize the loose segment using GIC until definitive treatment is available to prevent displacement of mobile coronal fragment. • Follow up with dentist in 24 hours for splinting. • Antibiotics not indicated.
Alveolar fracture		• Fracture involves the alveolar socket. May extend to adjacent bone • Segment mobility and dislocation with several teeth moving together are common findings. • Painful on percussion.	• Follow up with dentist in 24 hours for repositioning and splinting. • Prophylactic antibiotics as open fracture.
Concussion		• Tooth not displaced and has no fractures. • Painful on percussion.	• Follow up with dentist in 3 – 4 weeks. • Antibiotics not indicated.
Subluxation		• Tooth is tender on percussion and has increased mobility. • Blood around gingiva. • Tooth not displaced. • Bleeding from gingival crevice may be noted.	• Rinse with chlorhexidine 0.12% mouth wash BD for 10 – 14 days. • Follow up with dentist in 24 hours for repositioning and splinting. • Antibiotics not indicated.
Extrusion		• Tooth out of socket / appears elongated and is excessively mobile. • Tender on percussion. • Xray: increased periodontal ligament space apically.	• Analgesia. • Reposition if grossly elongated. • Follow up with dentist in 24 hours as require repositioning and splinting. • Rinse with chlorhexidine 0.12% mouth wash BD for 10 – 14 days. • Antibiotics not indicated.
Lateral luxation		• Tooth is displaced, usually in palatal/lingual or labial direction. • Tooth tender on percussion. • Usually associated with tearing of the gum margin and / or fracture of the alveolar bone. • Tooth is usually loosened, but may be firm in an alveolar fracture.	• Analgesia. • Follow up with dentist in 24 hours for repositioning and splinting. • Rinse with chlorhexidine 0.12% mouth wash BD for 10 – 14 days. • Prophylactic antibiotics as open fracture.
Intrusion		• Tooth immobile, pushed into socket / displaced axially into the alveolar bone. • Tender on percussion. • Xray: the periodontal ligament space may be absent from all or part of the root.	• Analgesia. • Rinse with chlorhexidine 0.12% mouth wash BD for 10 – 14 days. • Follow up with dentist in 24 hours for repositioning and splinting. • Antibiotics not indicated.
Avulsion		• Tooth is completely dislodged from the socket.	• Confirm tooth found / investigate for location. • Replant a permanent tooth as soon as possible. There are alternative storage media for avulsed teeth (e.g. milk), but none is as ideal as the socket. • Antibiotics indicated - *doxycycline PO 100 mg OD* for 7 days. • Urgent review by dentist.

Management of an avulsed permanent tooth

Key Points in handling an avulsed permanent tooth

- Do ***not*** allow the tooth to dry. Avulsed teeth which cannot be immediately replanted (e.g. patient unconscious) are ideally stored in plain milk. Wrapping in cling wrap with the patient's saliva or storing in the patient's mouth are less satisfactory alternatives. Sodium chloride 0.9% is not an ideal storage medium, and plain water will damage the critical cells on the surface of the root.
- Do ***not*** scrape the root surface.
- Do ***not*** rinse the tooth in water for a prolonged period.

Management of an avulsed permanent tooth

- Best prognosis if the avulsed tooth is immediately replanted – prognosis falls sharply after 60 minutes extra-oral time.
- Pre-replantation prophylaxis is required only for patients where the consequences of transient bacteremia are significant (e.g. previous bacterial endocarditis, immunosuppressive therapy, recently repaired cardiac defect)
- Handle the tooth only by its crown, never touch the root surface.
- Ensure tooth is clean and free of debris. If dirty, rinse for less than 10 seconds in milk. Alternatively use sodium chloride 0.9% or where there is no alternative, plain water.
- Examine the socket: reposition socket wall if fractured, irrigate large blood clot with sodium chloride 0.9% or local anaesthetic.
- Replant tooth to most ideal position with fingers holding only the crown; reposition adjacent teeth if moved from position.
    - When removing tooth from storage fluid for replantation, do not tip the fluid (and tooth!!) down the sink.
    - Review adjacent teeth anatomy to guide correct orientation of the tooth for replantation.
- Support the replanted tooth with fingers of one hand, and mould alveolar bone with fingers of the other hand.
- Irrigate degloving injuries of mucosa and suture if margins are not well opposed.
- Temporarily stabilise replanted and repositioned teeth by moulding several layers of domestic aluminium foil extending at least 2 teeth either side of the repositioned teeth.
- Replanted teeth must be properly stabilised by the dental team as soon as possible to form a stable splint for the traumatised tooth, and to commence appropriate endodontic treatment.
- If unable to replant: store completely submerged in milk OR wrap in cling wrap covered with patient's saliva. Seek dental treatment as soon as possible.

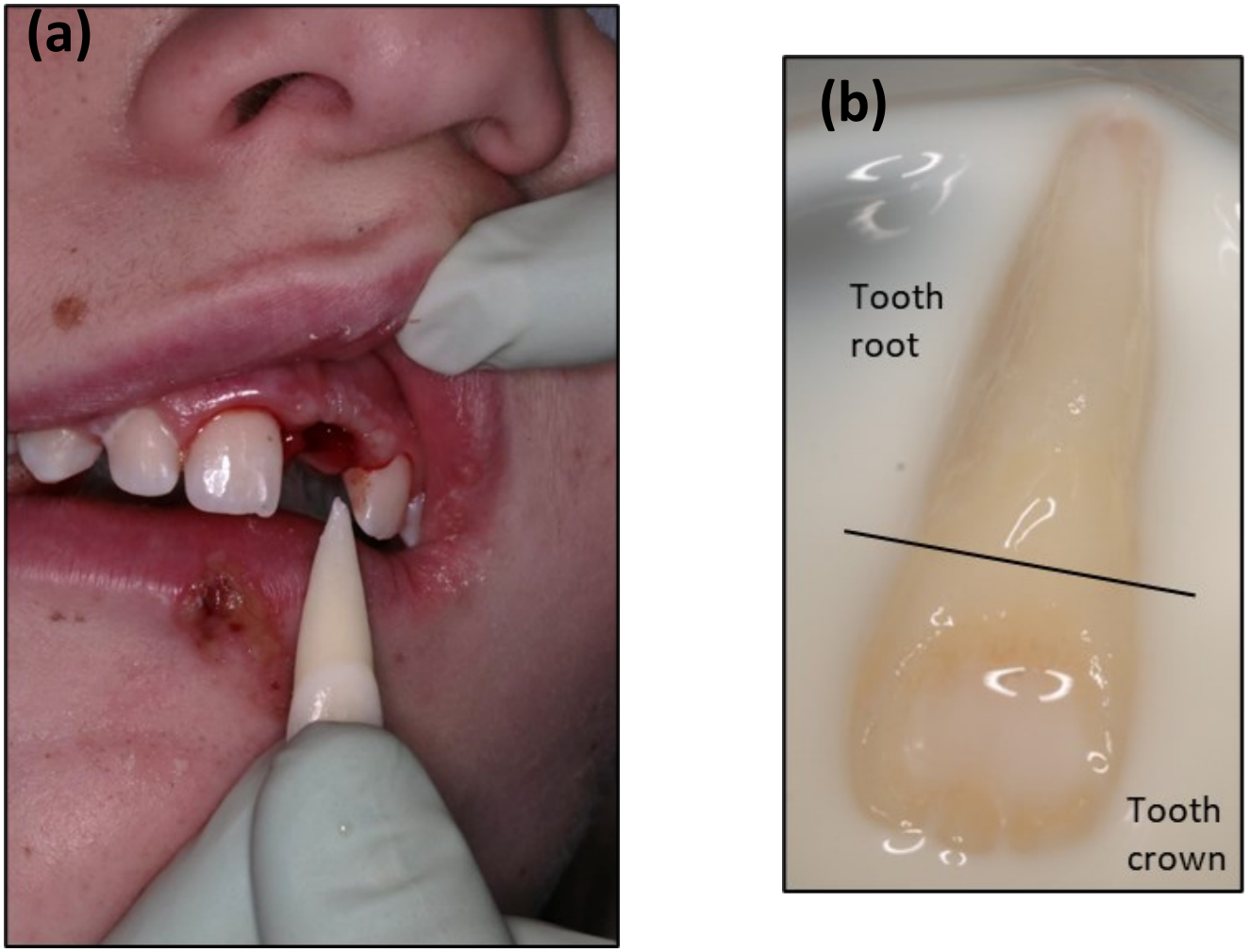


Figure 1.

(a) Clinical image demonstrating correct handling of an avulsed permanent maxillary central incisor – holding the tooth by its crown only, in preparation for replantation

(b) Clinical image of an avulsed permanent maxillary central incisor stored in milk, with tooth crown and tooth root labelled

Images courtesy of Dr Jilen Patel and Dr Hui Loh

(Dental Department, Perth Children's Hospital)

Injuries to the gingivae or oral mucosa

- Oral mucosa degloving injuries (gingivae stripped from underlying bone) can be missed if the lips are not firmly lifted away from the gum as part of the examination.
- Degloving injuries and deep lacerations or tears require operative cleaning, debridement and suturing to reduce the risk of osteomyelitis.
- Simple gingival lacerations or lip lacerations that do not cross the vermillion border rarely require suturing. Most will heal perfectly well by themselves, or with simple measures such as lip taping. Gingival lacerations require suturing if there is:
  - ◊ Significant tissue displacement
  - ◊ Bone exposure
  - ◊ Degloving of the maxilla or mandible
  - ◊ Exposure of tooth roots
  - ◊ Impaction of debris
  - ◊ Profuse bleeding

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Patient advice pending dental review

- Brush teeth and gums with chlorhexidine oral gel (Curasept ®) using a soft toothbrush and rinse with chlorhexidine 0.2% mouth wash BD for 5-7 days.
- No sticky or chewy foods like chewing gum, skittles, gummy bears, dried fruits or fruit roll-ups, thick and chewy bread and some chewy meats.
- Soft food diet (e.g. soups, soft cooked or mashed veggies, baked beans, soft fruit like bananas) for 2 weeks.
- Avoid hot/warm food and drinks.
- Avoid contact sports while healing.
- Recommend a custom fitted sports mouthguard for future activities.

Dental services available

We do not provide routine dental care and do not have a dentist on-call at Sir Charles Gairdner Hospital

- During working hours (Monday – Friday 8 am – 6 pm) advise patients to contact their own dentist or visit https://www.dental.wa.gov.au/Find-a-Clinic/ or ph (08) 9313 0555 and make an appointment.
- Afterhours contact the **Dental Advice Service** line *(ph 1800 098 818)* for advice.
- Advice patient to look for a dentist on Australian Dental Association's website https://ada.org.au— they need to scroll down and click on Find a dentist and then enter their suburb
- **Oral health centre of WA** *(ph 6457 4400)* offers subsidised dental care subject to means testing.
  - Emergency clinic 2pm to 5pm on Saturdays, Sundays and public holidays but patients require appointment that can be arranged by calling 6457 7626 between 1:30-4:30pm.
- **Derbarl Yerrigan** *(ph 1300 420 272)* provides a free dental service to Aboriginal and Torres Strait Islander people who are regular clients of Derbarl GP clinics.

References:

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3. Dental Trauma Guide website http://dentaltraumaguide.org (Accessed April 2023)
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5. Trick of the Trade: Dental Avulsion and Subluxation entry, Academic Life in Emergency Medicine https://www.aliem.com/trick-of-trade-dental/

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