Emergency Management of Orofacial Problems

- Assessing Facial Injuries
- Investigating Facial Trauma
- Specific Facial Fractures
- Dental Nomenclature
- Dental Trauma
- Toothache and Dental Caries
- Dental Abscesses
- Links

Most acute orofacial problems relate to either trauma or infection.
Some orofacial problems can only be temporarily managed in the Emergency Department and will need referral for immediate or delayed specialist care.
Orofacial problems which are associated with significant deformity or bleeding may pose an airway risk and should be approached accordingly.
Always consider the possibility of non-accidental injury in children with orofacial injuries.
In Auckland the point of contact at all hours for advice on acute maxillofacial and dental problems is the Dental House Surgeon on call via the operator.

Assessing Facial Injuries

- Establish the mechanism of injury. Do not forget associated head and cervical spine injuries.
- In older children and teenagers ask if the vision is normal, whether any part of the face feels numb, and whether their bite feels normal.
- Look for swelling, deformity and asymmetry.
- Check eye movements and pupils. Look for both enophthalmos and exophthalmos. Check visual acuity if eye injury is suspected.
- Palpate for tenderness, fractures and subcutaneous emphysema.
- Test sensation in the distribution of the infra-orbital nerves.

Investigating Facial Trauma

- Facial x-rays are easily performed and will detect most significant injuries. They can be difficult to interpret and assistance should be sought from the Children’s Emergency Department (CED) senior medical officer, or the radiology team.

- Patients who have a depressed level of consciousness and those who require CT scanning of the head for trauma should usually have a CT scan of the facial bones rather than x-rays if a facial injury is suspected.

- X-rays of the mandible include AP, lateral and orthopantomogram (OPG) views. The OPG is a panoramic x-ray which can detect most mandibular and tooth fractures and is preferred over AP and lateral views. An OPG should also be done when looking for radiographic evidence of a dental abscess. Currently children need to be sent to the adult emergency radiology department for OPG films to be done.

- Isolated nose injuries do not require imaging in the Emergency Department.

Specific Facial Fractures

- **Nasal fractures**: These are one of the most common facial injuries in children. Look for swelling and septal deviation. Palpate the bridge of the nose for tenderness. Visualise the nares for blood and look for a septal haematoma. Check patency of the nares by asking the patient to sniff when the other nostril is occluded. A septal haematoma needs to be drained acutely by the Otorhinolaryngology (ORL) team. Most patients should have GP review in one week once the swelling has settled to be assessed for deformity and referred to ORL if needed. However if there is obvious deformity on arrival to CED a referral for outpatient ORL review should be made by the CED team. Repair of nasal fractures should occur within 1-2 weeks of injury.

- **Orbital blow-out fractures**: These typically occur when the orbit is struck directly by a blunt object, for example a cricket ball or a fist. The inferior or medial orbital walls are thinnest and typically fracture first. Ask about diplopia. Look for enophthalmos, abnormal eye movement (especially limitation of upward gaze) and altered sensation in the infra-orbital region on the affected side. Assess visual acuity. These fractures should be reviewed by both the ophthalmology and maxillofacial teams.

- **Zygomatic fractures**: Isolated fractures should be discussed with the maxillofacial team for either immediate review or early outpatient review.

- **Zygomatico-maxillary fractures (“tripod” fractures)**: These complex fractures involve the zygomatic bone and one or more of its sutures with the frontal, maxillary or sphenoid bones. These should be referred to the maxillofacial team for either immediate review or early outpatient review depending on the complexity of the fracture and associated injuries.

- **Alveolar fractures**: These may be associated with tooth injury and should be referred to the maxillofacial team for either immediate review or early outpatient review.
Emergency Management of Orofacial Problems

- **Mandibular fractures**: Look for trismus, malalignment of teeth, intra-oral bleeding and tenderness to tooth percussion. Palpate the condyles while the patient opens and closes the mouth to feel for condylar fractures. Ask older children to bite down hard on a wooden spatula and twist it. In the absence of a fracture, you should be able to twist hard enough to break the spatula without eliciting pain. Do this on either side of the jaw. All mandibular fractures should be discussed with the on-call maxillofacial team to make a decision about the need for early operative intervention.

- **LeFort fractures**: These fractures are usually the result of considerable force and are seen mostly in the context of motor vehicle injuries in older children. These all require CT scanning and immediate maxillofacial review. Anticipate significant bleeding and airway compromise. Obtain urgent expert help if the patient might need intubation.
  - **LeFort I** fractures involve separation of the maxilla from the rest of the facial skeleton with resultant mobile upper dentures on examination.
  - **LeFort II** fractures involve separation of the maxilla and nose from the rest of the facial skeleton with resultant mobile maxilla and nose on examination.
  - **LeFort III** fractures (or cranio-facial dissociation) involve separation of the entire facial skeleton from the frontal bone and resultant mobility of the entire face on examination. When looking at the patient from the side, there will be a “dish face” deformity. These in particular are associated with airway compromise.

**Dental Nomenclature**

- Primary tooth eruption begins at about 6 months of age and is usually complete by 3 years of age.
- Secondary tooth eruption usually begins at 6 years of age.
- There are 20 primary and 32 secondary teeth. It is useful to identify the tooth of clinical concern prior to contacting the dental house surgeon. Use the World Dental Federation notation below.

![Permanent teeth notation system](image-url)
Emergency Management of Orofacial Problems

Dental Trauma

- **Dental fractures**: If a tooth fragment is not lost then keep it (stored in water or milk) as it may be able to be reattached. The tooth fragment is best stored in the fridge until the patient is seen by a dentist or the dental house surgeon. If fragments of teeth are missing consider a chest x-ray or lateral soft tissue neck x-ray to look for fragments within the airway, or an abdominal x-ray to prove the fragment has been swallowed.

  The Ellis classification of dental fractures is as follows:

  - **Ellis I fractures** are through the enamel only and are painless. If able, have the child see their own dentist within 24 hours, otherwise refer to the dental house surgeon on call.

  - **Ellis II fractures** are through the enamel and dentine. The tooth will have the yellow dentine exposed and will be sensitive to percussion. These fractures should be reviewed by the dental house surgeon as the dentine needs to be covered (usually with calcium hydroxide paste) to reduce the chance of infection and pulp necrosis.

  - **Ellis III fractures** involve the pulp. The pink colour of the pulp will be exposed. These will be painful and tender to percussion. There is a high risk of infection and early treatment is important, and should therefore be reviewed acutely by the dental house surgeon. These may be temporarily covered with moist gauze or cotton.

- **The avulsed tooth**: For secondary teeth, handle gently by the crown, rinse gently in water, saline or milk and reimplant into the socket if able. This is best done as soon as possible. The child should bite down gently onto a piece of gauze to keep the tooth in place. If unable to reimplant, keep the tooth stored in milk or patient’s saliva (never store a whole tooth in water), and place in the fridge. If reimplanted successfully the child may be seen by a community dentist that day (under ACC), otherwise contact the dental house surgeon for an acute review.

  If the tooth has been outside of the mouth for over an hour and has dried out, do not reimplant without discussion with the dental house surgeon.

  Do not reimplant primary teeth. Do not reimplant teeth into immunocompromised children or those at risk of bacterial endocarditis without discussion with the CED senior and the dental house surgeon. These children usually require prophylactic antibiotics prior to reimplantation. Please see the Endocarditis Prophylaxis guideline.

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Page: 4 of 6
Emergency Management of Orofacial Problems

- **The concussed tooth** will be tender to percussion but in a normal position and not loose. Follow-up by a dentist is recommended as there is still a small chance of complications.

- **The subluxed tooth** has been loosened by trauma but in a normal position. The child may be able to be discharged on a soft diet for 2 weeks, soft brushing after meals, chlorhexidine mouth wash and follow-up with their own dentist.

- **The luxated tooth** has moved from its normal position. It may be extruded, intruded or have a lateral luxation. If there is only minor displacement and the child is comfortable, then follow-up can be done with a dentist but preferably on the same day. Otherwise discuss the case with the on-call dental house surgeon. Advise a soft diet for 2 weeks, soft brushing after meals and chlorhexidine mouth wash.

**Toothache and Dental Caries**

- Preschool and primary school children who present with simple toothache or dental caries should be directed to the local school dental therapist during working hours and school holidays. The phone number and location of the nearest open dental clinic can be found by calling the School Dental Service on 0800 825 583.

- After hours and at weekends the child can be taken to the family dentist or to an Emergency Dental Clinic.

- Children who cannot see their local dental therapist or dentist may attend the Relief of Pain service at the Oral Health Unit, Greenlane Hospital between 8.15am and 11am on weekdays.

- After hours, the hospital dental service is usually not involved with simple toothache or dental caries cases, unless there is associated facial swelling or systemic signs, or the child is a regular patient of the department (e.g., medically compromised). The hospital dental service will review inpatients at Starship Hospital with an appropriate referral.

- Paracetamol and/or Ibuprofen should be adequate for pain relief and antibiotics do not need to be prescribed in the absence of facial swelling or systemic involvement.

**Dental Abscesses**

- Facial swelling due to dental abscess is usually preceded by a history of dental pain and there is usually tenderness on percussion of the involved tooth. The OPG view may show the abscess.

- Assess for systemic illness (fever, tachycardia, shock). Assess for airway compromise. Look for drooling and the ability to swallow secretions and maintain oral intake.

- Mild cases can be managed with oral antibiotics and dental review with consideration for tooth extraction.

- More severe cases should be discussed with the dental house surgeon on call for admission for intravenous antibiotics and consideration for tooth extraction.

- Tooth extractions should not be performed in CED, and ketamine sedation is not appropriate due to the risk of laryngospasm and airway compromise.

- Amoxicillin or penicillin plus metronidazole are reasonable regimens. Clindamycin can be used in patients who are allergic to penicillin.\(^6,7\).
Emergency Management of Orofacial Problems

Links

1. Auckland Regional Dental Service
2. The Dental Trauma Guide website (recommended by the New Zealand Dental Association)
   http://www.dentaltraumaguide.org/

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