

INTRODUCTION

Eye, ear, nose, and throat (EENT) and dental emergencies can encompass a broad range of pathologies that are reflected elsewhere in the EHS guidelines, such as airway obstruction, facial trauma, and burns.

Although rarely life-threatening, some EENT or dental emergencies can result in permanent damage, such as blindness, or adverse cosmetic outcomes.

SAFETY

When managing these emergencies, the clinician is likely to be in close proximity to the patient's face. Anticipate the patient will be producing aerosolized particles and ensure the appropriate PPE is worn. If irrigating a chemical from a patient's eye, take measures to ensure the chemical dose not run onto you or the rest of the patient.

The clinician should consider the cause of the injury. If the trauma was due to assault, explosion or a caustic substance for example, other services may be required (e.g. law enforcement, fire department, or Hazardous Materials team).

ASSESSMENT

For any EENT or dental pain, have the patient answer all OPQRST questions.

Eye Emergencies

Eye emergencies can include:

- Sudden Vision Loss
- Chemical Splash
- Welders Flash/Thermal Burn
- Foreign Body
- Blunt/Penetrating injury

No matter what the cause, when assessing a patient with any eye emergency, ask if they wear corrective lenses and/or contact lenses, or if they have a prosthetic eye. If they do wear contact lenses, ask what kind (soft or hard lenses) and if they have them in currently.

Other questions to ask include:

- Has their eyesight been affected?
- What changes in vision have occurred?

- Blurred vision?
- Complete vision loss?
- Is there a visual field defect?
- When did the change(s) start?

- Is there any previous ocular history such as cataracts, glaucoma, or jaundice due to hepatic disease?
- Is there an abnormal sensitivity to light?
- Is there a sensation of scratching, tearing, or pain in the eye?
- Does the patient have a headache, nausea and/or vomiting?

Physical exam should include looking at both the eyelid and the eye for:

- Periorbital trauma
- Global rupture
- Redness
- Swelling
- Blood or purulent discharge
- Foreign body
- Pupillary response
- Pupillary abnormalities

Ear Injuries

It is important to fully assess the ear after head or facial trauma, as the ear is prone to adverse cosmetic outcomes. For example, a simple hematoma in the cartilaginous portion of the ear, if not drained acutely, can result in major deformity such as a 'cauliflower ear'. Ear lacerations, if not repaired quickly, can also result in very visible adverse cosmetic outcomes.

Another frequent complaint that can be related to the ear is vertigo. Vertigo will cause the patient to feel as if they are spinning or the room is spinning around them. There are numerous causes, including inner ear or brain conditions. Vertigo differs from presyncope (e.g. light-headedness or dizziness), in that there is: [1] a sensation of movement with vertigo, and [2] no sensation of loss of consciousness. There may be other associated symptoms such as nausea and vomiting or nystagmus. It is helpful to conduct a thorough history to differentiate whether the patient's symptoms are vertigo or presyncopal.

Epistaxis

Unilateral bleeding suggests the most common form of epistaxis – anterior epistaxis. Bilateral bleeding suggests the possibility of a posterior epistaxis

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which usually requires more invasive ED therapy and admission to hospital.

Ascertain the presence of any other non-nasal signs of bleeding (e.g. bruising), which may suggest a bleeding disorder.

Clearly document which nare the bleeding is coming from and associated risk factors for epistaxis which include:

- PMHx: Hypertension, Trauma, Bleeding disorder (e.g. hemophilia, von Willebrand disease)
- Medication: Anti-platelet/Anti-coagulant

Throat Emergencies

Patients presenting with sore throat may have some degree of swelling in the upper airway, whether it be due to tonsillar swelling, peritonsillar abscess, epiglottitis, or foreign body. It is important to watch for any signs of stridor or respiratory distress that may indicate impending airway obstruction (refer to Airway Management Guideline). Assess for any possibility of foreign body ingestion or food bolus impaction. This may be the cause of the sore throat or could suggest an esophageal obstruction.

Airway obstruction and airway bleeding (e.g. post-tonsillectomy bleeding) are two high risk throat-related emergencies. Post-tonsillectomy bleeding can rapidly become a life-threatening emergency. Ask the patient when the surgery occurred and how long the bleeding has been occurring. Bleeding most commonly occurs 5-7 days postop.

Dental Trauma

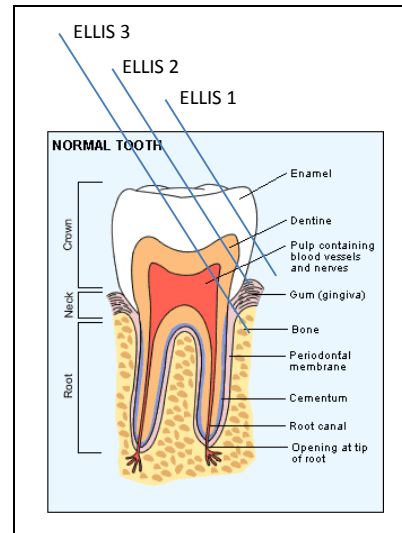
Determine the mechanism of injury and assess for associated injuries. It is also important to determine the time the injury occurred and the number and location of avulsed/fractured teeth.

Tooth Avulsion: A tooth avulsion is when the tooth is completely displaced from its socket. A tooth that has just loosened within the socket is known as a subluxation.

Tooth Fracture: Fractured teeth are often described in terms of the Ellis Classification (Figure 1). An Ellis 1 fracture is when there is a minor ‘chip’ where the chipped portion remains the same color as the tooth (i.e. only the enamel is affected). A more significant injury is an Ellis 2 fracture, where two tones are visible (e.g. yellow dentin is exposed against the

white enamel). The most serious and most time sensitive injury, requiring emergent care, is the Ellis 3 fracture. It is easily recognized by the three tone appearance of the visible pulp (red or black), against the yellow dentin, and white enamel. Both Ellis 2 and 3 fractures will be tender to the touch and with air exposure.

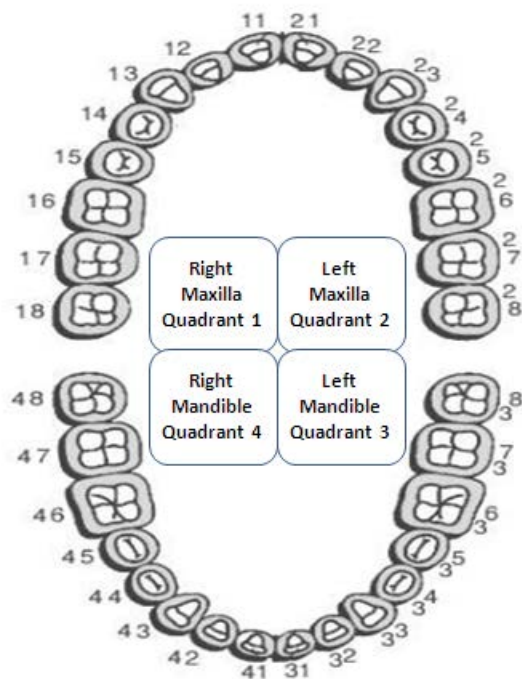
Figure 1. Ellis Classification of Dental Fractures



To aid in communication with the OLMC physician, ED staff, and for documentation purposes, it is useful to know which tooth has been injured. In adults, teeth are classified as to the quadrant they are located in a clockwise fashion. This is followed by the counting the number of teeth starting at the midline. Quadrant ‘1’ is the right upper maxilla, quadrant ‘2’ is the left upper maxilla, quadrant ‘3’ is the left lower mandible, and quadrant ‘4’ is right lower mandible. For example the right ‘eye tooth’ would be labeled as the 1-3 tooth.

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MANAGEMENT

When managing an EENT/Dental emergency, it is most important to treat any critical underlying conditions first. Isolated EENT/Dental emergencies are very rarely life-threatening. If trauma to the head or face has occurred, first manage any airway compromise or head injury. Only once the critical injuries are dealt with should the clinician start managing the individual EENT/Dental concerns.

Traumatic Eye Emergencies

For any chemical injury to the eye, immediate initiation of copious irrigation has the greatest impact on prognosis (**PEP white**). Irrigation also helps to clear any residual particulate matter from the eye and can also be used to remove irritants such as pepper spray. If the chemical agent is known, refer to a hazmat booklet for interactions of that particular chemical with water and for notes on any alternative irrigation treatments. Ideally, the affected eye should be irrigated as soon as possible in an eyewash or shower station with sterile saline solution. Sterile physiologically balanced solutions reduce the chance of further damage to the eye. If sterile saline is not available, cool tap water allows for dilution of the agent. While irrigating, have the patient attempt

to hold their eyelids open as wide as possible to optimize irrigation. A topical anesthetic (Tetracaine) can be applied prior to irrigation to blunt the blink reflex and provide some pain relief (**PEP white**). Once the eye has been irrigated, apply a compress soaked with saline over the eye. If there is any residue or object in or around the eye after irrigation, leave it in place until a physician has had a chance to assess the patient. Saline-soaked compresses can also be used for patients who have received a burn due to heat or welder's flash as well.

Burns caused by alkali substances are much worse than acidic substances and will continue to burn. Irrigation should continue all the way to the hospital.

Patients who have received a blunt or penetrating injury to the eye, including when there is a foreign body impaled in the eye, should be assessed carefully for head and c-spine injury.

If an object is still impaled in the eye, the object must be immobilized by packing gauze and/or bandages around it and then both eyes patched and protected (**PEP white**). If the eye has been avulsed, DO NOT attempt to put the eye back in the socket. Secure and immobilize the eye as best as possible to prevent any movement. It is important not to compress the affected eye when applying the bandages.

General Treatment for Any Traumatic Eye Injury

- Never remove contact lenses unless OLMC has been contacted.
- With a traumatic eye injury, try to prevent raised intra-ocular pressure by minimizing the risk of sneezing, gagging, or vomiting. Consider administering a narcotic for pain (**PEP white**) and anti-emetic for nausea or vomiting (**PEP white**).

Medical Eye Emergencies

Any vision loss is considered an emergency condition and requires early ED assessment. It is critical to determine the onset of symptoms and whether painless (e.g. acute retinal artery occlusion) or painful (e.g. glaucoma, periorbital cellulitis).

Ear Injuries

Soft tissue injuries to the ear, such as lacerations, can be managed with direct pressure and bandaging. If a piece of an ear has been avulsed, retrieve it if possible, wrap it in saline-soaked gauze,

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place it in plastic and keep the plastic bag on ice. Transport the avulsed tissue with the patient.

Like eye injuries, if the ear has come in contact with a caustic substance, irrigate both the outer ear and ear canal with copious amounts of fluid.

No matter what the ear injury, do not remove any earrings or other ear piercings.

It is critical that patients with auricular hematomas be referred acutely to the ED for definitive treatment.

Consider administering an anti-emetic for patients complaining of vertigo.

Epistaxis

Advise patient to gently blow their nose to express any clot burden from the nose prior to attempting hemostasis.

Position the patient leaning forward so the nasal passageway is directed downwards towards the floor (**PEP white**).

Maintain continual firm pressure to the bilateral nares for 15 minutes (**PEP white**). IT IS CRITICAL that pressure is NOT applied to the bridge or bony part of the nose.



Provide an emesis bag to the patient to manage any blood expelled from the mouth or nose. Consider an anti-emetic if the patient is nauseated.

Throat Emergencies

Any airway compromise should be managed according to the Airway Management Guideline.

Post-tonsillectomy bleeding can become serious very quickly. These patients should be transported and monitored for any increase in bleeding.

Dental Trauma

If a tooth has been fractured or avulsed, check that the tooth is not in the mouth, to prevent swallowing or aspiration of the tooth.

Always handle the tooth by the crown, not the root, never rinse it off or rub/scrape the outside, and do not let the tooth dry out

Always transport the tooth with the patient. It is preferable to place the tooth in milk for transport (**PEP white**). Alternative solutions include: saliva or saline. Harmful solutions to put the tooth in include: water, electrolyte drinks, and contact lens solution.

As the pulp of the tooth can get infected very easily, management for Ellis 2 and Ellis 3 fractures includes attempting to cover the remaining tooth as to prevent intraoral and environmental bacteria contamination.

Pediatric EENT Emergencies

For the most part, EENT emergencies in the pediatric population are similar to adults.

Children commonly insert foreign bodies, such as toys, crayons and food, into their ears and noses. Clinicians should only remove a foreign body from the ear if it can be grasped and removed easily. Nasal foreign bodies should only be removed if they are causing airway compromise or can be easily removed with your fingers.

If appropriate, consider asking the patient to gently blow their nose to expel any foreign body.

TRANSFER OF CARE

Clearly communicate with the emergency department regarding clinical findings and treatment provided. In the case of dental avulsion, ensure the receiving facility is given the tooth. Clearly state the time of injury for avulsed teeth as for re-implantation to be successful, it must occur within a specific period of time. If a chemical injury has occurred, indicate what the chemical is, if known.

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CHARTING

When documenting assessment and management of an EENT/Dental emergency, ensure the following is documented:

- ✓ Any signs of head injury
- ✓ Any signs of airway compromise
- ✓ Any risk factors associated with epistaxis
- ✓ Time of occurrence/onset and duration of symptoms
- ✓ Pupillary response and any abnormalities noted in the case of eye emergencies

including an appropriate text description in the comment section. Only by appropriate, accurate and complete charting can we build the case for new techniques and strategies.

REFERENCES

<https://emspep.cdha.nshealth.ca/>

Ma OJ, Cline DM, Tintinalli JE, Kelen GD, & Stapczynski JS. (Eds.). (2004). *Emergency Medicine Manual* (6th ed.). New York, NY: McGraw-Hill.

Key Points – EENT Emergencies

Recognize that EENT emergencies may have a more critical associated injury.

Foreign bodies in the eye and suspected ruptured globes require strict eye protection with minimal eye movement.

Alkali (e.g. soap) burns to the eye are often more severe than acidic burns

Transfer avulsed or fractured teeth with patient.

KNOWLEDGE GAPS

Any interest in research regarding EENT/Dental can be directed to EHS via the following link: <http://www.gov.ns.ca/health/ehs/>

EDUCATION

The optimal management of these emergencies is under continual review for ongoing continual medical education. Any recommendations for content delivery can be directed to the Performance and Development Department.

QUALITY IMPROVEMENT

It is important for the paramedic to record the overall management in the ePCR. This will require completion of the various fields in the ePCR,

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PEP 3x3 TABLES for EENT + DENTAL EMERGENCY MANAGEMENT

Throughout the EHS Guidelines, you will see notations after clinical interventions (e.g.: **PEP 2 neutral**). PEP stands for: the Canadian Prehospital Evidence-based Protocols Project.

The number indicates the Strength of cumulative evidence for the intervention:

- 1 = strong evidence exists**, usually from randomized controlled trials;
- 2 = fair evidence exists**, usually from non-randomized studies with a comparison group; and
- 3 = weak evidence exists**, usually from studies without a comparison group, or from simulation or animal studies.

The coloured word indicates the direction of the evidence for the intervention:

- Green = the evidence is supportive** for the use of the intervention;
- Yellow = the evidence is neutral**; and
- Red = the evidence opposes** use of the intervention.
- White** = there is no evidence available for the intervention, or located evidence is currently under review.

PEP Recommendations for EENT + Dental Interventions, as of 2013/04/05. PEP is continuously updated. See: <http://emergency.medicine.dal.ca/ehsprotocols/protocols/toc.cfm> for latest recommendations, and for individual appraised articles.

Foreign Body/Welders Flash/Chemical Splash Eye

Recommendation		RECOMMENDATION FOR INTERVENTION			
		SUPPORTIVE (Green)	NEUTRAL (Yellow)	AGAINST (Red)	NOT YET GRADED (White)
STRENGTH OF RECOMMENDATION FOR INTERVENTION	1 (strong evidence exists)				<ul style="list-style-type: none"> • Flush with > 1L Saline • Topical anaesthetic
	2 (fair evidence exists)				
	3 (weak evidence exists)				

Ocular Trauma

Recommendation		RECOMMENDATION FOR INTERVENTION			
		SUPPORTIVE (Green)	NEUTRAL (Yellow)	AGAINST (Red)	NOT YET GRADED (White)
STRENGTH OF RECOMMENDATION FOR INTERVENTION	1 (strong evidence exists)				<ul style="list-style-type: none"> • Avoid Pressure on Globe • Cover both eyes • Dimenhydrinate • Morphine • Transport with Head up 15-30 Degrees
	2 (fair evidence exists)				
	3 (weak evidence exists)				

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Pepper Spray

Recommendation		RECOMMENDATION FOR INTERVENTION			
		SUPPORTIVE (Green)	NEUTRAL (Yellow)	AGAINST (Red)	NOT YET GRADED (White)
STRENGTH OF RECOMMENDATION FOR INTERVENTION	1 (strong evidence exists)		• Flush with > 1L Saline		
	2 (fair evidence exists)				
	3 (weak evidence exists)				

Sudden Painless Vision Loss

Recommendation		RECOMMENDATION FOR INTERVENTION			
		SUPPORTIVE (Green)	NEUTRAL (Yellow)	AGAINST (Red)	NOT YET GRADED (White)
STRENGTH OF RECOMMENDATION FOR INTERVENTION	1 (strong evidence exists)				• Mild pressure eye
	2 (fair evidence exists)				
	3 (weak evidence exists)				

Epistaxis

Recommendation		RECOMMENDATION FOR INTERVENTION			
		SUPPORTIVE (Green)	NEUTRAL (Yellow)	AGAINST (Red)	NOT YET GRADED (White)
STRENGTH OF RECOMMENDATION FOR INTERVENTION	1 (strong evidence exists)				• Pressure • Seated leaned forward
	2 (fair evidence exists)				
	3 (weak evidence exists)				


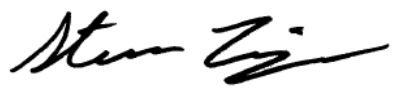
Tooth Avulsion


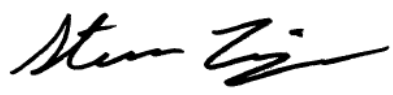
Recommendation		RECOMMENDATION FOR INTERVENTION			
		SUPPORTIVE (Green)	NEUTRAL (Yellow)	AGAINST (Red)	NOT YET GRADED (White)
STRENGTH OF RECOMMENDATION FOR INTERVENTION	1 (strong evidence exists)				• Milk • Saline • Water
	2 (fair evidence exists)				
	3 (weak evidence exists)				


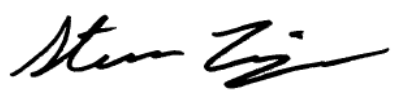
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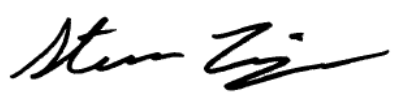
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