	Trauma Services	No. 4049
	Title: Maxillofacial Trauma- Shared	Page: 1 of 5 Effective Date: 05/30/2023

PURPOSE:

1. To define the priorities in the management of maxillofacial trauma.
2. To determine short-term treatment plans in the management of facial trauma.

POLICY STATEMENT:

Displaced fractures of facial bones and/or lacerations of the face, nose, ears, scalp, and neck. These fractures include fractures of the frontal bones, frontal sinuses, temporal bones, nasal bones, maxilla (midface), orbits, mandible, and larynx. Injuries to the eye (globe, optic nerve), penetrating trauma of the face, pharynx, larynx, and neck are also included.

PROCEDURES:

- I. Manage the ABCs. Remember that fractures of the facial bones are frequently associated with severe traumatic brain injury and cervical spine fractures.
 - a) Patients with facial fractures should not have the cervical spine cleared until they are truly alert and oriented and can provide feedback for a satisfactory exam of the neck.
 - b) **Airway:** Establishment of the airway is of primary importance in all patients with maxillofacial injuries. Due to the proximity of the maxillofacial skeleton to the airway, displaced fractures in this area can cause airway collapse and provide unique challenges in establishing a patent airway. Options range from clearing secretions with suction to cricothyroidotomy, depending on the location and severity of the injuries. All patients should be treated as if they have a cervical spine injury and hence the neck should be stabilized while establishing an airway. The following is a stepwise approach to establishing an airway:
 - i. Clear secretions and blood with suction
 - ii. Consider reduction of posteriorly displaced mandible and maxillary fractures with anterior manual traction or jaw thrust maneuver
 - iii. Orotracheal intubation with in-line stabilization: alternatives include
 1. Fiberoptically assisted orotracheal intubation
 2. Fiberoptically assisted nasotracheal intubation
 3. LMA (fast track)
 4. Avoid nasotracheal routes if anterior skull base fractures suspected
 - iv. Transtracheal airway: cricothyroidotomy, tracheotomy if upper airway obstructed by displaced fractures or uncontrolled hemorrhage and in patients with suspected laryngeal trauma.

Origination date: 01/31/1998


Prepared by: MGR, TRAUMA PROGRAM

Approved by: MEDICAL DIR TRAUMA - RALEIGH, PHYSICIAN, SURGEON

Reviewed: 05/30/2023

Revised: 05/30/2023

Printed copies are for reference only. Please refer to the electronic copy for the latest version.

	Trauma Services	No. 4049
	Title: Maxillofacial Trauma- Shared	Page: 2 of 5 Effective Date: 05/30/2023

- c) **Breathing:** Be aware of the possibility of aspirated blood and teeth. Any suggestion of aspiration would indicate the immediate need for a secured airway.
- d) **Circulation:** Bleeding from facial trauma can be significant and sometimes occult. Any hypotension should indicate the need for vigorous resuscitation.
- e) **Disability:** Perform a good neuro exam. In the conscious patient, anisocoria will be associated with direct globe trauma or damage to the oculomotor nerve.
- f) **Expose:** Make sure that the back of the scalp is examined for any lacerations that might result in severe bleeding. Control obvious vigorous bleeding before proceeding.

II. Control hemorrhage

- a) Do this as part of the Primary Survey
- b) Scalp bleeding can be controlled with staples, Rainey clips, whip stitched, or pressure
- c) Facial bleeding can be controlled temporarily with temporary suture.
- d) Nasal bleeding can be controlled with standard nasal packing or formal Foley balloons
- e) With uncontrolled bleeding from the mouth, feel for a comminuted mandibular fracture. If one is found, try to align the pieces as this may control bleeding. Oral packing with a large Kerlix can be used.
- f) With uncontrolled bleeding despite above measures, consider arteriography with embolization.

III. Once the patient has stabilized, perform a thorough physical exam looking for:

- a) Scalp lacerations.
- b) Depressed skull fractures.
- c) Depressed frontal sinus fractures.
- d) Orbital fractures.
- e) Eye injury, loss of eye motion, foreign body in eye, decreased visual acuity, pupillary response (APD).
- f) Malar and zygomatic arch fractures.
- g) Unstable nasal fractures, septal hematoma.
- h) Palate fractures, mobile midface.
- i) Maxillary and mandibular alveolar ridge fractures.

Origination date: 01/31/1998


Prepared by: MGR, TRAUMA PROGRAM

Approved by: MEDICAL DIR TRAUMA - RALEIGH, PHYSICIAN, SURGEON

Reviewed: 05/30/2023

Revised: 05/30/2023

Printed copies are for reference only. Please refer to the electronic copy for the latest version.

	Trauma Services	No. 4049
	Title: Maxillofacial Trauma- Shared	Page: 3 of 5 Effective Date: 05/30/2023

- j) Missing teeth.
 - k) Mandible fractures (malocclusion/oral lacerations, open bite deformity).
 - l) Sensory deficits.
 - m) Hemotympanum, lacerations of external auditory canal, temporal bone injury (Battle sign), facial paralysis/paresis.
 - n) Malocclusion.
 - o) Laryngeal injury: tenderness of thyroid, cricoid cartilage, crepitation, ecchymosis.
- IV. If clinically indicated perform facial CT.
- V. If a patient has open wounds, administer IV cefazolin unless contraindicated.
- VI. Consults:
- a) **ENT***: for facial fractures, large or complex facial lacerations, injuries to the external or middle ear, nose, oral cavity and oropharynx, or evidence of laryngeal/pharyngeal blunt or penetrating injury. (*Scalp lacerations or simple facial lacerations do not require ENT consult.*)
 - b) **Dentistry**: Dental avulsions with saved teeth and alveolar ridge fractures require dentistry consults.
 - c) **Ophthalmology**: An eye injury or serious periocular injury

*The following is a recommended priority list for ENT consultation and timing repair for maxillofacial injury.

Immediate consultation:

- d) Eye globe injury: visual loss, afferent pupillary defect
- e) Laryngeal injury.
- f) Penetrating laryngeal/pharyngeal injury.
- g) Temporal bone trauma: early exam of facial nerve integrity.
- h) All lacerations; initiate repair within 1 hour.

Early consultation (within 1 hour)/elective repair within 1-14 days:

- a) Mandible fracture.
- b) Midface fractures.
- c) Orbital fractures.

Origination date: 01/31/1998


Prepared by: MGR, TRAUMA PROGRAM

Approved by: MEDICAL DIR TRAUMA - RALEIGH, PHYSICIAN, SURGEON

Reviewed: 05/30/2023

Revised: 05/30/2023

Printed copies are for reference only. Please refer to the electronic copy for the latest version.

	Trauma Services	No. 4049
	Title: Maxillofacial Trauma- Shared	Page: 4 of 5 Effective Date: 05/30/2023

d) Temporal bone fractures (with facial nerve injury).

DEFINITIONS:

Orbital fractures: Upward gaze restriction, diplopia, and enophthalmos are hallmarks. If visual disturbance, afferent papillary defect, globe, optic nerve injury may be present. Immediate ophthalmology consult necessary. Fine cut axial/coronal CT are diagnostic. Repair within 7-14d. Early enophthalmosis >4mm, non-resolving oculo-cardiac reflex, globe injury require immediate repair.

Temporal bone fractures: Most commonly present with hearing loss, hemotympanum and/or bloody otorrhea, and loss of consciousness. Facial paresis/paralysis occurs in 10-50% of cases. Facial nerve integrity should be assessed clinically as soon after trauma as possible. Fine cut axial and coronal CT scan is the diagnostic study of choice. Delayed onset facial paralysis may require early facial nerve decompression. CSF otorrhea rarely requires intervention. Repair of ossicular chain damage is delayed 8-10 weeks.

Blunt laryngeal injury: Clinical signs include tenderness on palpation of thyroid/cricoid cartilage, neck crepitation (subcutaneous emphysema), hoarseness, aphonia, or airway obstruction. When present with airway obstruction, cricothyroidotomy or tracheotomy is method of choice for securing the airway. Fine cut axial CTs delineate fractures best. Fracture repair should occur within 24-48 hrs or when patient is stable.

Frontal Sinus Fracture: Clinical signs include: forehead depression, CSF rhinorrhea. Frontal subgaleal hematoma may mask underlying frontal sinus depressed bone fragments. Fine cut axial and coronal facial CT is study of choice. Fracture repair within 1-2 weeks unless obvious CSF leak, then repair as soon as possible when clinically stable.

Nasal Fractures: A fracture of the nasal bones or septal cartilage. Swelling, raccoon eye bruising, and mobility of the bony nasal pyramid are diagnostic. Septal fracture presents as bilateral nasal obstruction from septal widening due to hematoma. CT scan can be used to assess intraorbital injury, but plain films are of no value. Nasal fractures can be set within 7 to 10 days of injury; septal fractures with hematoma must be drained within 24 hours to prevent cartilage damage.

Mandible Fractures: Clinical findings include malocclusion and pain on palpation of the jaw or TMJ area. Patients should be asked if their teeth fit together properly; if not, mandible fracture is likely. Inspection of the intraoral mucosa may reveal tears or misalignment of the teeth (open bite indicates a condyles fracture). Radiographic study of choice is the Panorex. A reverse Towns view is helpful to evaluate the mandibular condyles.

Origination date: 01/31/1998


Prepared by: MGR, TRAUMA PROGRAM

Approved by: MEDICAL DIR TRAUMA - RALEIGH, PHYSICIAN, SURGEON

Reviewed: 05/30/2023

Revised: 05/30/2023

Printed copies are for reference only. Please refer to the electronic copy for the latest version.

	Trauma Services	No. 4049
	Title: Maxillofacial Trauma- Shared	Page: 5 of 5
		Effective Date: 05/30/2023

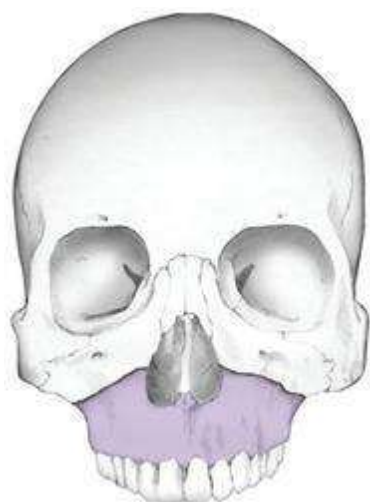
Zygomatic Arch or Malar Complex Fractures: Presents as a depressed cheekbone (malar eminence) often with concomitant orbital rim malposition. Usually obscured by soft tissue swelling in the acute setting, but firm palpation of both sides simultaneously will usually reveal the asymmetry. A fine cut facial CT in the coronal and axial planes are the diagnostic study of choice. Repair within 10 days unless ocular impingement exists, then emergent. Ophthalmology consultation is advisable in cases of orbital injury.

Le Fort (Midface) Fractures

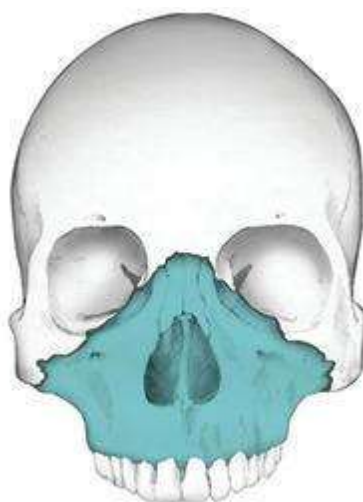
Le Fort I: Fractures through the pyriform aperture of the nose; the palate is mobile, the nasal dorsum and malar eminences are not.

Le Fort II: Fractures through the nasal root between the eyes and through the inferior orbital rims. The nasal dorsum and palate move as a unit but the malar eminences remain attached to the cranium.

Le Fort III: Fractures through the nasal root, lateral orbits, and zygomatic arches separate the face from the cranium. The nasal dorsum, palate, and malar eminences move as a unit.



Le Fort I



Le Fort II



Le Fort III

I. ASSOCIATED DOCUMENTS

- a. Advanced Trauma Life Support ATLS: Student Course Manual. (2012). 9th ed. Chicago: American College of Surgeons.

Origination date: 01/31/1998

Prepared by: MGR, TRAUMA PROGRAM

Approved by: MEDICAL DIR TRAUMA - RALEIGH, PHYSICIAN, SURGEON

Reviewed: 05/30/2023

Revised: 05/30/2023

Printed copies are for reference only. Please refer to the electronic copy for the latest version.