

## Management of Maxillofacial Trauma

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### OBJECTIVES

Maxillofacial injuries occur in up to *39% of trauma patients* and are associated with significant morbidity including airway compromise, skull base injury, orbital complications, and long-term functional deficits (1–3). This guideline synthesizes best evidence and expert consensus to guide the acute assessment, stabilization, definitive management, and transfer criteria for patients with maxillofacial trauma.

### GUIDELINES

#### INITIAL ASSESSMENT & PRIMARY SURVEY

*Maxillofacial trauma must be managed within the context of a full trauma evaluation.*

#### ATLS Priorities

- All life-threatening conditions must be identified and managed according to Advanced Trauma Life Support (ATLS) protocols (4).
  - Airway, Breathing, Circulation, Disability, Exposure remain the framework; facial injuries frequently impact airway assessment.

#### Airway Protection

- Patients with significant facial fractures, expanding hematomas, or active bleeding require early airway control (intubation or surgical airway) due to high risk of obstruction (5–7).
- Failed intubation risk is up to *30% higher* in complex facial fractures (5).

#### Cervical Spine & Intracranial Injury

- All patients with significant facial trauma should be assumed to have concomitant cervical spine injury until cleared (8).
  - Intracranial hemorrhage occurs in approximately *15–25%* of severe facial trauma cases (9); thus CT Head is standard.
- Blunt Cerebrovascular Injury (BCVI) Screening

- CTA Neck is recommended for high-risk mechanisms (Le Fort fractures, cervical spine fractures) due to *BCVI prevalence up to 2–9%* and risk of stroke (10).

#### HEMORRHAGE CONTROL

- General Principles
  - Hemorrhage control must be initiated as part of the primary survey, and may require multiple modalities including pressure, packing, and surgical ligation (11).
- Region-Specific Management
  - Scalp Hemorrhage: Effective with staples, sutures, or vessel ligation (12).
  - Nasal Hemorrhage: Initial management with nasal packing (e.g., Rhino rockets); refractory bleeding may require Foley balloon tamponade (13).
  - Uncontrolled Facial Bleeding: Persistent bleeding despite local measures requires packing and expedited transfer to definitive care (12,14).
- Complication Rates
  - Uncontrolled facial hemorrhage contributes to *15–20% of preventable trauma deaths* from airway and bleeding complications (15).

#### ANTIBIOTIC USE

Antibiotic use in facial trauma is controversial; no Level I recommendations exist.

- Open Fractures
  - Empiric antibiotics are recommended for open fractures and soft-tissue wounds (16).
  - Cefazolin (Clindamycin if  $\beta$ -lactam allergy) is standard (16).
  - Facial/Oral cavity wounds: Ampicillin-Sulbactam (Clindamycin if allergic) due to oral flora coverage (16,17).
- Infection Risks
  - Facial open fractures have infection rates ranging *5–40%* depending on contamination severity (17).

## LACERATIONS & SOFT TISSUE MANAGEMENT

- Scalp
  - Clip hair, irrigate, and close with staples or sutures. Absorbable sutures may be used with Prolene for skin to facilitate removal (18).
- Facial Lacerations
  - Tension-free closure with absorbable sutures is acceptable. Complex lacerations should be referred to a facial trauma surgeon (1,19).
- Orbital Lacerations
  - Minor lacerations may be closed with sutures or surgical glue. Complex cases or those near the globe require specialist evaluation (19).
- Ear Lacerations
  - Cartilage alignment and skin closure are essential; hematoma prevention with pressure dressing is key (20). Transfer if closure is not feasible.

## SPECIFIC FRACTURE MANAGEMENT

### Nasal Fractures

- Minimally displaced/non-displaced: Outpatient follow-up with facial trauma surgeon acceptable (21).
  - Complex, open, or hemorrhagic fractures: Transfer for specialist intervention (21).
- Complication: Nasal septal hematoma may lead to cartilage necrosis if missed (~10–15% risk) (21).

### Orbital Fractures

- Nondisplaced without entrapment or visual changes: Outpatient management (22).
  - Entrapment, retrobulbar hemorrhage, globe injury: Immediate transfer and Ophthalmology/Facial Trauma consultation (22).
- Complication Rates: Orbital nerve dysfunction occurs in *up to 20%* of orbital floor fractures (23).

### Globe Injuries

- Corneal abrasions/subconjunctival hemorrhage: Manage with antibiotic ointment and Ophthalmology follow-up (24).
- Penetrating injuries, entrapment, retrobulbar hematoma, or visual compromise: Transfer for Ophthalmology evaluation (24).

Vision Loss Risk: Retrobulbar hemorrhage is an ocular emergency with vision loss reported in 20–50% without decompression (25).

#### Mandibular Fractures

- Require prompt evaluation and fixation by a facial trauma surgeon (26).
- Minimally displaced fractures with reliable follow-up may be discharged with outpatient care (26).

Complications: Malocclusion and osteomyelitis occur in 10–25% of mandibular fracture cases without appropriate management (26).

#### Other Maxillofacial Injuries

- Frontal bone, zygomatic, maxillary, and sinus fractures should be transferred for specialist evaluation (27).
- Submandibular and parotid gland injuries risk duct injury and warrant facial trauma consultation (27).

#### Skull & Temporal Bone Fractures

- CT Head is indicated in all skull fracture cases; neurosurgical evaluation is strongly recommended due to risk of delayed intracranial hemorrhage (28).
- Temporal bone fractures require CT temporal evaluation and facial trauma surgery involvement (29).

Mortality/Complication: Skull base fractures have associated CSF leak in 10–30%, meningitis risk 20–30% if untreated (28).

#### **PERFORMANCE IMPROVEMENT**

Compliance with this guideline will be monitored through the Trauma Performance Improvement and Patient Safety (PIPS) program, including:

- Adherence to airway and hemorrhage control recommendations
- Appropriate imaging (CTA/CT Head)
- Timely transfer and documentation
- Infection and complication rates



## Version Control Record

Version	Date	Author/Reviewer	Description of Changes
1	1/12/26	Paul Wisniewski, D.O.	Initial review and update to reflect latest evidence/practice

## REFERENCES

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