

## NEUROTRAUMA PLAN OF CARE

**Effective Date:** 1/12/26

**Retires Policy Dated:** N/A

**Original Effective Date:** 1/12/26

**Updated Date:** N/A

### SCOPE

This guideline pertains to the management of patients sustaining traumatic brain injuries under the care of the Trauma Services.

### PURPOSE

The purpose of this guideline is to provide guiding principles for initial workup and management of brain and spine injuries and define which patient's need transfer for neurosurgery evaluation.

### MANAGEMENT OF TRAUMATIC BRAIN INJURIES

#### Workup

- Patients with decreased GCS ( $\leq$  13) and signs of head trauma should be transferred immediately by activating the Riverside County EMA Agency (REMSA) Continuation of Trauma Care Policy 5302.
  - No imaging is necessary to confirm diagnosis.
  - CT Head without contrast is the initial diagnostic modality of choice to evaluate for Traumatic Brain Injury.

#### Management is based on Imaging and Physical Exam findings:

- Patients with multisystem trauma, meeting other defined transfer criteria or physician discretion, should be transferred to higher level of care trauma center.
- Patients who are GCS 15 with uncertain radiologic results including questionable, tiny or trace ICH or patients with injuries >12 hours prior to presentation and normal neurologic exam can be observed at JFK at the discretion of the Trauma Surgeon.
  - Frequent neuro exams.
  - Repeat CT Head in 6 hours.
  - Keppra 1 gram IV in ED and 500 IV/PO Q12 hours for 7 days.
  - Repeat exam by Trauma Team in 6 hours.
  - Follow up with Family Doctor in Clinic.
  - Follow up with Trauma in Clinic.

- Any change in neuro exam, seizures, agitation – Repeat CT Head. If worsening findings, the patient should be transferred to higher level of care for neurosurgery evaluation.
- Intracranial hemorrhage with or without decreased GCS or Seizures Pre or Post Trauma
- Initiate immediate transfer to higher level of care for neurosurgery consultation.
- No imaging is required for transfer.
- Keppra 1 gram IV in ED and 500 IV/PO Q12 hours.
- Definitive airway for patients with GCS  $\leq$  8.
- Medical management of presumed elevated Intracranial Hypertension should be initiated in the ED.
  - Head of bed elevation at 30 degrees (reverse Trendelenburg).
  - Sedation and analgesia using short-acting agents in intubated patients (propofol, fentanyl, midazolam).
  - Hyperosmolar therapy
    - Mannitol administered at 0.25 – 1 gm/kg body weight (caution in hypovolemic/hypotensive patients).
    - Hypertonic saline administered in intermittent boluses of 3% sodium chloride (250 ml over 30 minutes).
  - Hyperventilate to goal PaCO<sub>2</sub> 30-35 mmHg.
- Reversal of known anticoagulation should be initiated in the ED (See Adult Anticoagulation Reversal Policy).

#### Initiation of DVT Prophylaxis

- For admitted patients, DVT prophylaxis should be started 72 hours after stable CT Head.

### MANAGEMENT OF SPINE INJURIES

#### Work up

- Initial workup of spine injuries includes CT without contrast of spines.
- Uncertain or age indeterminate fractures should be followed up with MRI.

#### Immediate Transfer

- All patients with neurologic deficits
- Patients with radiologic evidence of spinal injury that cannot be examined, i.e.: intubated or intoxicated patients.
- All cervical spine fractures
- All burst fractures
- All fracture-dislocation fractures.
- Any fracture with retropulsion into spinal canal.
- Any ligamentous injury identified on workup.

- All compression fractures with >25% height loss.

**Thoracic or Lumbar Compression Fractures with <25% Height Loss**

- Admit to Med/Surg.
- Multimodal pain management.
- PT and OT Evaluation.
- TLSO Brace.
- Upright X-Rays with Brace in place.
- Patients with pain that cannot be controlled or unstable fractures on Upright X-Rays should be transferred to higher level of care for Neurosurgery Consultation.

**Spinous Process or Transverse Process Fractures**

- Admit to Med/Surg.
- Multimodal pain management.
- PT and OT evaluation.
- No brace is needed but can be offered if pain cannot be controlled.

**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**

1. American College of Surgeons, Committee on Trauma. (2015). ACS TQIP Best Practices in Management of Traumatic Brain Injury. <https://www.facs.org/quality-programs/trauma/quality/best-practices-guidelines/>
2. Joseph B, Friese RS, Sadoun M, et al. (2014). The BIG (brain injury guidelines) project: Defining the management of traumatic brain injury by acute care surgeons. *Journal of Trauma and Acute Care Surgery*, 76(4), 965-969.
3. Nahmias J, Doben A, DeBusk G, et al. (2018). Mild traumatic brain injuries can be safely managed without neurosurgical consultation: The end of a neurosurgical “nonsult.” *Am Surg*, 84(5), 652-657.
4. Riverside County EMS Agency (REMSA). (2022). Continuation of Trauma Care – 5302. <http://www.remsa.us/policy/>

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- The guidelines are for informational purposes only and are not intended to replace professional medical judgment. They should be used as a reference and adapted to the specific needs of individual patients.
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