STEPWISE APPROACH TO ELEVATED ICP IN PATIENTS WITH SEVERE TBI

TIERO

TIER 1

TIER 2

TIER 3

Standard Measures

- □ Endotracheal intubation and mechanical ventilation
- ☐ Head of bed elevation 30-45°
- □ Temperature < 38°C
- □ pO2 >65 mm Hg
- □ pCO2 30-40 mm Hg
- □ Serum sodium: 135-140 mEq/L

Initial Treatment

- □ Analgesia-based sedation for RASS goal 0 to -2
- □ Add propofol infusion to RASS goal 0 to -2 if sedation and ICP goals not achieved with analgesia
- Drain CSF from EVD, avoid overdrainage
- □ Hyperosmolar therapy with hypertonic saline with sodium goal 145-150 mEq/L or mannitol



Persistent ICP Elevation

- □ Repeat CT scan to identify surgically correctable pathology
- □ Increase treatment with hypertonic saline to a sodium goal 150-160 mEq/L
- □ Deep sedation with propofol for RASS -5
- □ Increase CPP goal to >70 mm Hg
- □ Increase FiO2 if required for PbtO2 goal*



Refractory ICP Elevation

- □ Repeat CT scan to identify surgically correctable pathology
- □ Decompressive craniectomy

Alternative to decompressive craniectomy:

- □ Barbiturate coma
- □ Therapeutic hypothermia 32-24°C



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DEFINITION

Severe TBI: head trauma with GCS ≤8.
ICP elevation >20 mm Hg for > minutes with functional EVD and the patient is not coughing, being suctioned, or agitated.

GOALS

ICP ≤ 22 mmHg CPP >60 mmHg PbtO₂ > 20 mmHg

ABBREVIATIONS

ICP: intracranial pressure; EVD: External Ventricular Drain; TBI: traumatic brain injury; CPP: cerebral perfusion pressure; PbtO2: brain tissue oxygen; pO2: partial pressure of oxygen; pCO2: partial pressure of carbon dioxide; RASS: Richmond Agitation-Sedation Scale; CSF: cerebrospinal fluid; CT: computed tomography; FiO2: fraction of inspired oxygen.

* If advanced monitoring is available

