TRAUMATIC BRAIN INJURY (TBI) & NEUROSURGERY
IN THE DEPLOYED ENVIRONMENT

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IMPROVED OUTCOMES REQUIRE:

POINT OF INJURY CARE

- TCCC for life threatening injuries
- Hypotensive → Blood or TXA (2gms ≤ 3 hrs post injury)
- 3% Hypertonic saline
- GCS ≤ 8 → SBP ≥ 110mmHg
- SaO2 > 93% → PaCO2 35-45mmHG → $EtCO_2$ 35-45 mmHg

CARE ≤ 5 HOURS POST-INJURY

Who

- Penetrating head trauma
- Open skull fracture
- All moderate & severe TBI
- Mild TBI w/persistent confusion

What

- Neurosurgeon
- Advanced imaging
- Required equipment
- Critical care

Scope of TBI Casualties

14%: Combat casualties

23% - 30%: Prehospital casualties

30% - 45%: Hospital deaths

Classification

Mild	GCS 13 - 15
Moderate	GCS 9 - 12
Severe	GCS 3 - 8

MONITOR

- ICP < 22mmHg
- CPP 60-70mmHg
- PbtO2 > 20mmHg
- Quantitative pupillometry (NPi) < 3 concerning for increased ICP

MEDICAL MANAGEMENT

- Maintain normothermia
- Increase head of bed: ↑ 30°-45°
- Gastric ulcer prophylaxis

Sedation

- Propofol 20-75 mcg/kg/min
- Ketamine 2mg/kg
- Intermittent narcotics

Antiepileptic Meds

- Keppra
- Vimpat
- Phenytoin

Intracranial Hypertension

- Hypertonic saline (3%)
- Na+ 150-160 mmol/L
- Mannitol 1g/kg Bolus (avoid in hypovolemic/ hemorrhagic shock)

GOALS
- SBP >110mmHg
- MAP > 60mmHg
- SaO2 >93%
- PaCO2 35-45 mmHg at every role of care

METRICS

INTERVENTIONS
- Seizure prophylaxis
- ABX for open skull fractures
- NO STEROIDS
- ICP monitor placed prior to transport
- Hourly documentation of ICP/CPP & ventriculostomy drainage

Clinical tips based on the Traumatic Brain Injury and Neurosurgery in the Deployed Environment CPG. This CPG and others can be found at: JTS CPGs : HTTPS://JTS.HEALTH.MIL/INDEX.CFM/PI_CPGS/CPGS