Pediatric Severe Traumatic Brain Injury
PICU Management Protocol

Post resuscitation GCS ≤ 8*

**Notify Neurosurgery with increased ICP requiring treatment.**

Insert ICP Monitor or CSF Drainage
Begin hyperosmolar therapy (3% saline) as needed to keep Na+ high normal (Goal Na+ 145)

Maintain age appropriate CPP
- 0-6mo: >50
- 6mo-6 yr: > 55
- >6yr: >60

ICP > 20 mm Hg for 5 min

Sedation & Analgesia, +/- Neuromuscular Blockade
1. Fentanyl or Morphine
2. Versed only if opiate insufficient,
   3. Paralytic
   DO NOT wake during first 48hr after injury. Avoid non-essential movement, road trips.

Hyperosmolar therapy
- 3% saline: 3-5 cc/kg (Goal Na 150-170, target lowest Na which controls ICP; each cc/kg 3% will raise serum Na by 0.5 mmol/L) OR
  - Mannitol: 0.5-1gm/kg if Serum Osm <320

CSF drainage
- Placement of ventriculostomy if not already done.
- If EVD already in place, discuss with NSG lowering level to increase drainage

2nd Tier Therapies
- Barbiturate Therapy if EEG active
- Decompressive craniectomy if unilateral or bilateral swelling
- Mild hyperventilation if evidence of hyperemia (PaCO2 30-35 mmHg)
  - Mild-moderate hypothermia

Withdrawal of ICP directed therapies should occur step-wise and only after 24 hrs without escalation in therapies or raised ICP

Surgical Intervention as Indicated
- Epidural hematoma
- Space occupying lesion w/ midline shift
- Increasing ICP despite medical management.

Throughout treatment continue the following interventions:
- Reverse Trendelenburg 30°
- Normocarbia CO2 35-40 mmHg, strict avoidance of routine hyperventilation
- Normothermia, cooling blanket as needed to prevent fever!
- Maintain age appropriate BP
- cEEG on all patients and aggressively treat all seizures. Start seizure prophylaxis for all patients.
- Neurosurgery consult

For Acute Herniation
Bradycardia (Tachycardia in small children)
Hypertension
Dilated pupil(s)
Lateralizing signs.

- Bolus Mannitol (1gm/kg) OR 7.5% saline
- Hyperventilation
- Obtain STAT Head CT
- Call Neurosurgery

*Exclude pharmacologic reasons for non-purposeful exam.

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