Protocol for managing paediatric severe traumatic brain injury

**TARGETS**
- SpO₂ >97%, PaO₂ >9kPa, PCO₂ 4.5-5 kPa
- Temp < 37°C, Glucose 4-7 mmol/l
- Serum Sodium > 140 mmol/l

**ICP/CPP**

<table>
<thead>
<tr>
<th>Age (yr)</th>
<th>ICP (mm Hg)</th>
<th>CPP (mm Hg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;3</td>
<td>5-15</td>
<td>40</td>
</tr>
<tr>
<td>4-7</td>
<td>15-20</td>
<td>40-50</td>
</tr>
<tr>
<td>&gt;8</td>
<td>&lt; 20</td>
<td>50-60</td>
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</tbody>
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**Stage A**
- Nurse 30° head up
- Ensure no venous obstruction to neck
- Sedation:
  - Midazolam: 50-300 µg/kg/hr
  - Fentanyl: 1-3 µg/kg/hr or
  - Morphine: 20-80 µg/kg/hr
- Paralysis:
  - Atracurium: 300-600 µg/kg/hr or
  - Vecuronium: 50-100 µg/kg/hr
- Anticonvulsants: Phenytoin 15 mg/kg (depressed #, seizures)
- Antibiotics: none for CNS reasons unless discussed with neurosurgeons
- Ventilation: TV 6-8 ml/kg & rate to keep pCO₂ in target range, no hyperventilation

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**ICP/CPP targets not met?**

**Stage B**
- 5% saline 2-4 ml/kg
  (can be repeated but plasma osm < 320) or
  Mannitol 20% 2 ml/kg
- Ventilation pCO₂ ~ 4.5 kPa
- Hypothermia: temperature 35°C
- External ventricular drain if feasible
- Consider anticonvulsants if not already given

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**ICP/CPP targets not met?**

**Stage C**
- Discuss with PICU consultant/ neurosurgery team and decide either
- Thiopentone 2 mg/kg/hr to achieve burst suppression (cfm/ continuous EEG) or
- Consider decompressive craniectomy

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**SPINE**

Consider unstable until cleared by the neurosurgeons
Use sandbags/tape/collar to immobilise

** Patients Details**

<table>
<thead>
<tr>
<th>ICP Target:</th>
<th>Signature:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm Hg</td>
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</table>

** PICU on-call bleep:** 152-001

**Neurosurgical bleep:** 156-0358

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