**Traumatic Brain Injury: Management guidelines**

**Neurosurgical ICU, Beaumont Hospital 2018**

All patients at risk of increased ICP should have arterial line, CVP and ICP monitor. Guidelines may be modified at the discretion of senior clinicians.

Management of raised ICP is primarily the responsibility of the Neurosurgical team (in collaboration with ICU Team).

**Step I**

MAP > 80, ICP < 20, CPP > 60

30° head up, no venous obstruction
SaO₂ ≥ 97%; PaO₂ ≥ 11 kPa, PaCO₂ 4.5 – 5.0 kPa, PEEP +5cm. Use Volume Control ventilation.
Temp 36-37°C (cool if necessary): Bld Sugar 5-8 mmol/L, Na⁺ 140-150 mmol/dl

**Sedation:**
- Propofol 2 - 4 mg/kg/hr.
- Midazolam 5 -10 mg/hr, morphine 5-10 mg/hr
- Consider Dexmedetomidine 0.7 - 1.4 µg/kg/hr (instead of midazolam).
- Remifentanil 0.1 – 0.4 µg/kg/min, atracurium 0.5mg/kg/hr

*If on propofol - do daily lipid screen; if plasma triglycerides↑ - reduce dose. After 48 hr of propofol – use lower dose range*

Occasional brief cough or motor response is tolerated if no prolonged ↑ in ICP
Ranitidine 50mg 8 hrly IV, enteral feeding
Phenytoin 15 mg/kg (over 30 min) if indicated (seizures, depressed #).

*If ICP > 20 consider CT; if CT or surgery not indicated - proceed to Step II*

**Step II**

20% Mannitol 0.4g/kg x 3 or until plasma osmolality ≥ 320 mosm/l
Consider bolus 1ml/kg 8% NaCl * or 3 ml/kg 3% saline
Use infusion of saline 3% to increase Na⁺ to 150.

*If ICP > 20, consider CT; if CT or surgery not indicated - proceed to Step III*

**Step III**

Consider lowering CO₂ to 4.0 kPa
Consider anti-epileptics if EEG shows seizures.
Consider ↑ CPP to 70
Consider ↑ Na⁺ to 155

**Step IV (if ICP remains > 20)**

Consider EVD or decompressive craniectomy
Consider thiopentone; 250 mg boluses up to 3-5 g + thiopentone 2.5% infusion @ 5-20 mls/hr. Titrate to Burst Suppression Ratio 70-90 % on EEG. Maintain CPP with fluids and vasopressors (noradrenaline).

**Children:** as above but guidelines for CPP are lower to reflect normal values for each age i.e. CPP 40 - 60 mmHg for neonates to teenagers respectively.
Propofol only for short periods (up to 6 hrs).

*To prepare 8% saline, remove 60 ml from 250ml bag of 0.9% saline and replace with 60 ml 30% saline.*