

## **Traumatic Brain Injury; management guidelines, Beaumont Neurosurgical ICU:**

(January 2018)

All patients at risk of ↑ ICP should have arterial line, central line and ICP monitor.  
Keep BP transducer at level of earlobe to measure the true CPP.

*Management of raised ICP is primarily the responsibility of the Neurosurgical team*

### **Step I**

**MAP > 80, ICP < 20, CPP > 60**

30° head up, no venous obstruction

SaO<sub>2</sub> ≥ 97% ; PaCO<sub>2</sub> 4.5 – 5.0 kPa, Volume Control ventilation, PEEP +5cm.

Temp 36-37°C (cool if necessary): Bld Sugar 5-8 mmol/L, Na<sup>+</sup> 140-150 mmol/dl

Sedation; Propofol 2 - 4 mg/kg/hr., midazolam 5 -10 mg/hr, morphine 5-10 mg/hr.

Consider remifentanyl 0.1 – 0.4 µg/kg/min, atracurium 0.5mg/kg/hr

*If on propofol - do daily CK + 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**

10% Mannitol 0.4g/kg x 3 or until plasma osmolality ≥ 320 mosm/l

Consider bolus 1.5 ml/kg 8% NaCl \*

Use infusion of NaCl 3% to increase Na<sup>+</sup> to 150.

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

### **Step III**

Consider lowering CO<sub>2</sub> to 4.0 kPa (note risk of cerebral ischaemia)

Consider anti-epileptics if EEG shows seizures.

Consider ↑ CPP to 70

Consider ↑ Na<sup>+</sup> to 155

Consider hypothermia 34°C (note finding of **worsened** outcomes in Eurotherm trial).

Reduce propofol to 2mg/kg/hr if hypothermic

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

Consider EVD or decompressive craniectomy

Consider thiopentone; 100 mg boluses + thiopentone 2.5% infusion @ 5-20 mls/hr - titrate to Burst Suppression Ratio 70-90 % on EEG.

**Children;** as above but CPP target is lower to reflect normal values for each age.

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.