NHS
Greater Glasgow and Clyde

CLINICAL GUIDELINES

Traumatic Brain Injury Management

A guideline is intended to assist healthcare professionals in the choice of disease-specific treatments.

Clinical judgement should be exercised on the applicability of any guideline, influenced by individual patient characteristics. Clinicians should be mindful of the potential for harmful polypharmacy and increased susceptibility to adverse drug reactions in patients with multiple morbidities or frailty.

If, after discussion with the patient or carer, there are good reasons for not following a guideline, it is good practice to record these and communicate them to others involved in the care of the patient.

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Important Note:

The Intranet version of this document is the only version that is maintained.
Any printed copies should therefore be viewed as 'Uncontrolled' and as such, may not necessarily contain the latest updates and amendments.

INS Glasgow – Guidelines for Management of Severe Traumatic Brain Injury

February 2022

These guidelines are adapted from the Seattle International Severe Traumatic Brain Injury Consensus Conference guidelines, 2019. They follow a tiered structure. In general, clinicians should use the lowest tier to treat intracranial pressure (ICP). There is, however, no hierarchy to individual treatments within a tier; and it is not necessary to exhaust all treatments within a tier prior to moving to a higher tier. As always, clinical context and clinical judgement take priority in management; it may be necessary to skip a tier when needing to rapidly advance treatment.

At All Times - when treating raised ICP:

- Reassess the patient and consider CT scan to characterise intracranial pathology
- Re-evaluate surgical options
- Reconsider extracranial causes of raised ICP
- Review physiological parameters and ensure goals are met
- Reconsider escalation to senior clinicians / neurocritical care / neurosurgery depending on clinical context

"Tier Zero" – fundamental care

- ICU admission; intubation and ventilation; EtCO2 monitoring ; arterial BP monitoring
- Regular assessments of patient neurology and pupillary status
- Elevate head of bed to approximately 30 degrees; keep head in midline; ensure cervical collars are not restrictive to venous return
- Ensure adequate analgesia titrated to pain, and sedation titrated to agitation, ventilator asynchrony, etc.
- Avoid fever; treat temperature >38˚C
- Avoid hyponatraemia
- Consider prophylactic anticonvulsants for one week only
- Consider aiming for CPP 60-70mmHg (assume ICP 20mmHg if not monitored)

"Tier One"

- Increase analgesia and/or sedation
- Maintain PaCO2 at lower end of normal range (4.7 – 5.1 kPa)
- Hypertonic saline by intermittent bolus*
- Mannitol by intermittent bolus*
- Consider seizures as a cause, and use of anticonvulsants and / or EEG

*2.7% hypertonic saline is the concentration used in the INS, given at a dose of 3mL/kg, to a sodium limit of 155mmol/L. 20% mannitol may also be used at clinician's discretion, at a dose of 0.5-1g/kg, to an osmolar limit of 320mEq/L (beware diuresis and fall in MAP). Use of hyperosmolar therapy should prompt rediscussion with a neuroscience centre.

Tier Two

- Consider a trial of neuromuscular blockade (bolus, with infusion only if efficacious)
- Consider mild hypocapnia (4.3 – 4.6 kPa) – avoid if cerebral ischaemia suspected
- Assess autoregulatory status, and consider fluids / vasopressors / inotropes to raise CPP if autoregulation intact
- Consider EVD insertion; CSF drainage if EVD *in situ*

Tier Three

Discussion with Neurocritical Care Consultant and/or Neurosurgery Consultant required

- Consider thiopentone coma if efficacious (avoid hypotension and monitor serum potassium); consider cEEG to assess burst suppression
- Consider active cooling to 35-36℃
- Consider decompressive craniectomy

Sudden and critical worsening where herniation or impending herniation is suspected, should be managed by:

- Stabilisation and emergent imaging; or in the presence of known surgical pathology, stabilisation and emergent transfer to theatre
- immediate evaluation of possible causes
- empiric treatment with hyperosmolar fluids / hyperventilation
- consideration of imaging
- rapid escalation of treatment

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