Protocol for Management of raised intracranial pressure

Impending cerebral herniation following traumatic brain injury in the ED:

Signs of raised intracranial pressure (ICP)
- Altered consciousness (irritable, drowsy, coma)
- Weakness
- Hyperreflexia and/or hypertonia
- Sunsetting sign in infants

Signs of impending transtentorial herniation
- Altered consciousness – particularly any rapid deterioration
- Dilated or irregular pupil
- Lateral deviation of the eye
- Nystagmus
- Bradycardia
- Hemiparesis
- Abnormal posturing – extensor or decorticate
- Bradycardia, hypertension, altered / reduced respirations (Cushing response. A late sign)

Management of raised ICP

General measures
- Ensure good oxygenation and normocapnia
- Head tilt 15 – 30 degrees
- Maintain blood glucose above 3mmol
- Maintain blood pressure (aim for systolic > 95 centile for age)
- Treat pyrexia with antipyretics or active cooling
- Treat pain / agitation with opioid analgesia, intubate, paralyse and sedate
- Insert urinary catheter unless urethral injury suspected

Specific measures for impending herniation:
- Hyperosmolar therapy
  - Mannitol 20% 1.25 – 2.5 ml/kg over 20 minutes; avoid in renal failure and caution in haemorrhagic shock
    Or
  - Hypertonic saline 3% 5ml/kg over 20 minutes; consider in multiple trauma where signs of hypovolaemia
  - A second treatment may be given with caution
- Controlled hyperventilation
  - Aim for PaCO2 between 25-30mm Hg (end tidal CO2 monitoring)
- Alert PICU and neurosurgical team. Arrange imaging.

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