Management of Severe Traumatic Brain Injury – Guideline

**General Goals**
- \( \text{SaO}_2 > 90\% \)
- \( \text{PaCO}_2 = 35-40\ \text{mmHg} \)
- \( \text{MAP} > 90\ \text{mmHg} \)

**Management Options for Intracranial Hypertension or Herniation Prior to Placement of ICP Monitor**
1. Maintain neck in neutral position with cervical collar
2. HOB elevated to 30 degrees
3. Mannitol 1 gram/kg
4. Hyperventilation (temporary) to an EtCO2 of 30
5. 3% HTS 250 ml bolus

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**GCS \( \leq 8 \) or inability to protect airway**

**Already Intubated?**

- **Yes**
  - Resuscitate with NS/LR and blood per ATLS protocol
  - Avoid Albumin
  - Initiate Hyperosmolar therapy with mannitol 1 g/kg, caution if patient is hypotensive
  - Obtain early neurosurgical consultation

- **No**
  - **Signs of Herniation Present?**
    - **Yes**
      - Identify and stabilize other immediate life–threatening injuries
      - Obtain noncontrast CT scan of the brain
      - For patients on Warfarin, order PT/INR and Prothrombin Complex Concentrate
    - **No**
      - **Hypotension?**
        - **Yes**
          - Establish Baseline Neurological Examination RSI while maintaining inline stabilization (Consider Ketamine for induction if patient hypotensive 1-2mg/kg)
          - Confirm tube placement (breath sounds, chest xray, capnography)
        - **No**
          - Achieve Normocapnia (ETCO2 35-40mmHg)
          - Maintain Oxygenation (SpO2 > 90%)
          - Avoid Hypotension (SBP <90 mmHg)

**1. Immediate neurosurgical consultation for decompression of lesion with mass effect.**
**2. Consult neurosurgery for intraventricular catheter placement for lesion without mass effect.**
**3. Administer Prothrombin Complex Concentrate for patient on Warfarin (see “Warfarin-associated TBI guideline”). Enter “Profilnine” under orderset.**
**4. For patients on Dabigatran, administer recombinant activated Factor VII (40 mcg/kg). As a last resort, consider prothrombin complex concentrate (PCC) (25 units/kg) to help with clot formation at the site of bleeding (See “Management of Bleeding on Dabigatran” guideline).**
**5. Ensure adequate post intubation analgesia and sedation to decrease intracranial pressure (see “Post intubation analgesia and sedation” guideline)**
**6. Antiseizure prophylaxis: Phenytoin or Fosphenytoin (20 mg/kg or 20 phenytoin equivalents/kg)**
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Glasgow Coma Scale

<table>
<thead>
<tr>
<th>Eye Opening (E)</th>
<th>Verbal Response (V)²</th>
<th>Motor Response (M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 - Opens spontaneously¹</td>
<td>5 – Alert and Oriented</td>
<td>6 – Follows commands</td>
</tr>
<tr>
<td>3 - Opens to Voice</td>
<td>4 – Disoriented or confused</td>
<td>5 – Localized to pain³</td>
</tr>
<tr>
<td>2 - Opens to Pain</td>
<td>3 – Incoherent words</td>
<td>4 – Withdraws to pain</td>
</tr>
<tr>
<td>1 - None</td>
<td>2 – Incomprehensible sounds, moaning</td>
<td>3 – Flexion posturing</td>
</tr>
<tr>
<td></td>
<td>1 - None</td>
<td>2 – Extension posturing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 - None</td>
</tr>
</tbody>
</table>

1. Patient should attend to the examiner in order to score a 4 on the eyes.
2. Score the patient as a “T” or “I” if patient is intubated or has tracheostomy.
3. Patient should cross midline to address the noxious stimulus in order to score 5 on the motor score.

This guideline was ratified by the emergency department faculty at Maine Medical Center in March 20xx. It reflects our expert opinion and is not necessarily applicable to all institutions. It is intended to be a reference for clinicians caring for patients and is not intended to replace providers’ clinical judgment.

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