


SUBJECT: Policy and Procedure for the Management of Traumatic Brain Injury Cases from Emergency to Intensive Care	
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1.0 Policy

- 1.1 - To protect the brain from progression of primary brain injury and secondary brain injury
- 1.2 – All patients with signs of increased ICP should receive ICP monitoring

2.0 Definition: (Grading)

TBI conditions are categorized by means of the Glasgow Coma Scale (GCS) as:

- Minor if GCS is 14-15
- Moderate if GCS is 9-13
- Severe if GCS is < 8

3.0 Procedure

3:1 Assessment

A - Neurological assessment

- Severe and moderate TBI cases should be admitted to ICU for follow-up.
- Minor TBI cases either can be admitted to general medical ward for 24 hrs for observation, or discharged home with the instructions to come back if any neurological symptoms occur

B - After a very quick clinical evaluation, categorizing the case as minor, moderate

OR


severe, the most important and urgent are:

- Blood pressure with target of systolic BP of > 90 mmHg.
- Oxygenation with target of O2 saturation of > 90

Urgent airway protection (intubation) if needed.

Both moderate and severe cases should have brain CT scan as soon as their clinical condition allows. In penetrating TBI, CT angiography is indicated.

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C – Primary and secondary trauma survey protocol

3:2 Resuscitation

Isotonic saline (0.9%) to be used for hemodynamic support.
- 500 cc maximum – if not responding, follow shock protocol

3:3 ABC (CXR)

3:3.1 Indications for Intubation:

Severe traumatic brain injury (GCS <8)

3:3.2 Procedure of Intubation

- Follow ACLS Protocol


4.0 Indications for ICP Monitoring

4.1 All patients with a severe traumatic brain injury and an abnormal brain CT (hematoma, contusions, swelling, herniation, or compressed basal cisterns).

4.2 Severe TBI with a normal brain CT if two or more of the following features are noted at admission:
- age over 40 years
- unilateral or bilateral motor posturing
- systolic BP < 90mmHg.

4.3 Severe TBI with normal brain CT, repeat brain CT after 24 hours, if radiological signs of increased ICP are there , ICP monitoring is indicated.

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Target ICP is <20mmHg
Target CPP is > 60mmHg

5.0 Modalities of ICP Monitoring

Who is to insert it – (Nursing Policies and Procedures – ICP Monitoring #)

- 1) Neurosurgeon
- 2) Intensivist (only for epidural ICP monitoring)

6.0 Management of Increased Intracranial Pressure (In 24 hours)

Sedation and Analgesia Protocol


- 6.1.1** In case of acute increase of Intracranial Pressure, Clinically by unequal pupils OR radiologically by brain CT scan, the following steps are taken
- Propofol to be used for sedation, and fentanyl for analgesia.
 - Straight, elevated head, 30 degrees
 - Hyperventilation with PCO₂ target of 30-35, not less, for maximum of 12 hours
 - Mannitol with dose of 0.5gm/kg every 6 hour, not more than 6 doses

Serum osmolality to be followed every 6 hours, and to be 310-320

Serum sodium to be followed every 6 hours NA 145 – 150 mmol

- After 12 hours, if ICP still not controlled, Hypertonic Saline 3% can be added as continuous infusion , 0.5 ml/kg/hr for 12 hours
- If ICP is still not controlled, Barbiturates can be given as:
 - Loading dose 10 mg/kg over 30 min; 5 mg/kg every hour for 3 doses. Maintenance 1mg/kg/hr.
- Muscle relaxant to be used, if ICP is difficult to control.
- Normal temperature or hypothermia protocol

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- Craniectomy if ICP is not controlled with all of the above measures.

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In Intensive Care Unit:

- RMH-ICS Category A Patient Care
- Brain CT scan for every SEVERE TBI case, after 24 hrs, unless ICP is monitored
- Brain CT for moderate TBI cases, if no improvement after 24 hrs
- Brain CT scan in case of sudden deterioration, such as inequality of pupils or sudden increase of ICP, if monitoring is there, after exclusion of central causes such as pain, poor sedation or other causes
- In severe TBI cases, and normal brain CT on admission, with no neurological improvement, after 4 days in ICU, brain MRI to be done looking for diffuse axonal injury (DAI)
- Hold sedation every 24 hrs for neurological evaluation
- NO role for steroids in TBI
- Control of blood sugar, < 140
- Normal temperature or hypothermia
- Sequential compression devices for lower limbs, and prophylactic anticoagulation after 36 hrs , if no contraindications
- Prophylactic Phenytoin for 7 days, and can be discontinued, if no convulsions
- Prophylactic antibiotics (Ceftriaxone) especially in penetrating TBI
- Start enteral feeding as soon as possible
- Gastric ulcer prophylaxis

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