

# Protocol: Severe Traumatic Brain Injury – Management of the Adult: Age ≥ 18

## Resuscitation Phase of Care: Emergency Department



Hennepin County **Medical Center**

Traumatic Brain Injury Center • [www.hcmc.org/braininjury](http://www.hcmc.org/braininjury)

*This protocol is developed utilizing the Brain Trauma Foundation's 3<sup>rd</sup> Edition of the "Management of Severe Traumatic Brain Injury" (May 2007). [www.braintrauma.org](http://www.braintrauma.org) Any deviation from the national guidelines will be resourced.*

Parameter	Goal during Resuscitation Phase	Source Document
Neurological Checks	Assess GCS at time of admission to ED (prior to intubation and sedation when possible), at post-resuscitation and as needed in between	
Oxygenation	Patient to be on 100% FiO2 Goal O2 saturation 100% Goal PaO2 100mmHg unless otherwise instructed Goal PaCO2 30-35 unless otherwise instructed Avoid hyperventilation unless there are signs of progressive neurological deterioration unresponsive to other measures. Hyperventilate to ICP of 25mmHg. Keep PaCO2 > 25mmHg RSI is preferred method of intubation unless contraindicated iSTAT ABG for baseline All intubated patients must have an end tidal CO2 monitor	
Blood Pressure Management & Fluid Resuscitation	Goal SBP > 100mmHg SBP not to exceed 160mmHg MAP > 80mmHg until CPP can be measured Maintain pressures with fluids, crystalloid (NS) with colloids and blood products as needed. If fluids unsuccessful begin Norepinephrine .01 - 0.3 mcg/kg/min (notify MD for dose > 0.15mcg/min) Second option is Dopamine 1 - 15 mcg/kg/min	
Fluid Management	NS (isotonic fluids) unless otherwise instructed No dextrose containing solutions	
Electrolyte Management & Hyperosmolar Therapy	Begin infusion of 5% NaCl 150 ml IV over 15 minutes x 1 in patients with progressive neurological deterioration or a CT scan showing tight cisterns or midline shift May infuse peripherally in a new <b>large vessel</b> site. Change infusion to a central line as soon as possible	HCMC ED protocol (Biros, Jancik & GL Rockswold)

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Parameter	Goal during Resuscitation Phase	Source Document
Timing of Craniotomy	Any patient who is progressively declining and/or with symptoms of uncal herniation syndrome, should be taken emergently to the operating room. For example: <ul style="list-style-type: none"> <li>- midline shift &gt; 1 cm</li> <li>- epidural hematoma &gt; 30-40 cc volume</li> <li>- subdural hematoma with thickness &gt; 0.5 cm extending over the hemispheres or &gt; 30-40 cc volume</li> <li>- intraparenchymal hemorrhage &gt; 30 cc in temporal lobe or cerebellum</li> </ul> Patients who have herniated & have significant hemorrhage secondary to herniation into their brainstem should not be offered surgery	
Intracranial Pressure Monitoring	Placement in ED left to the discretion of the Neurosurgery Staff MD or Chief Resident MD Goal ICP < 15 mmHg	
CPP Management	Goal > 60-70 mmHg Do not exceed 70mmHg unless otherwise instructed	
Glucose Management	Goal range: < 150 mg/dl No treatment required in the ED phase of care unless glucose > 300 mg/dl as risk of hypoglycemia is greater than risk of hyperglycemia	
Anti-convulsant Therapy	Fosphenytoin load 18 mg/kg (PE) IV in normal saline at a rate of 50 - 100 mg/min in central line or secure peripheral line	HCMC Clinical Therapeutics Manual
Lab	At minimum: complete blood count, type & screen, basic metabolic panel, coagulation studies, ABG	
Radiological Imaging	Non-contrast CT scan ASAP	
Transport	Per hospital policy	

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### **Recommendations for Transfer to a Level 1 Trauma Center:**

We have listed criteria to assist you in determining if your TBI patient should be transferred to a Level 1 Trauma Center:

- 1) All severe TBI defined as GCS ≤ 8
- 2) Any patient requiring neurosurgical intervention
  - a. Acute intracranial pathology such as hematomas > 1-2 cc, compressed basal cisterns, contusions
  - b. Penetrating injury or open fracture of the skull
  - c. Basilar skull fracture with or without CSF leak
- 3) Moderate or mild TBI with abnormal CT findings
- 4) TBI associated with child abuse

Other considerations:

- 1) Carotid or vertebral arterial injury
- 2) Systemic hypotension (systolic BP < 90 mmHg in adults or BP < age stated norms for children)
- 3) Any patient at the discretion of the referring physician

**To transfer a patient to Hennepin County Medical Center, call Hennepin Connect at (612) 873-4262 or 1-800-424-4262.**

**To make an outpatient appointment for your patient, please call:**

Mild/Moderate TBI Clinic (≥ age 13) .....(612) 873-2595 option 4  
Pediatric Brain Injury Program Coordinator.....(612) 873-2259  
TBI Center Program Coordinator .....(612) 873-3284

**For questions regarding this protocol please contact the TBI Center Program Coordinator at (612) 873-3284 or [carolann.smith@hcmcd.org](mailto:carolann.smith@hcmcd.org)**

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