

Traumatic Brain Injury (TBI) Resuscitation

Moderate/Severe TBI

- Mechanism (blunt head trauma)
- GCS <13

Standard ATLS approach of primary and secondary survey

Initial treatment:

- 2 large bore IVs or consider IO access early
- Supplemental oxygen
- Consider blood transfusion for hemorrhage
- Cervical spine precautions
- Maintain normal blood pressure, oxygen saturation, and temperature

Indications for endotracheal intubation:

- Inability to protect airway
- Deteriorating neurologic status
 - GCS drop of 2 OR new neurological deficits
- GCS ≤8
- Inability to oxygenate/ventilate adequately

Considerations for Severe TBI:

- Administer 3% hypertonic saline bolus (IV, 5mL/kg, MAX 500 mL/dose)
- Keep head of bed at 30°
- Sedate with midazolam, and continuously monitor ETCO₂ (maintain ETCO₂ 35-45 mmHg)

Therapies to reduce cerebral oxygen consumption (seizures):

- Consider levetiracetam (IV, 40mg/kg) for seizure prophylaxis

Do you have pediatric neurosurgery capabilities?

Yes

Imaging:

- Consider head CT without IV contrast
- Refer to **Best Practices in Pediatric Trauma Imaging** for additional imaging indications for blunt multisystem trauma

No

Do not delay transfer to obtain head CT

- Initiate transfer process
- Contact pediatric trauma center (PTC)
- Shared decision making for head CT scan locally or at referral trauma center

Severe TBI=GCS <9
Moderate TBI=GCS 9-12

Pediatric Glasgow Coma Scale (GCS)

	< 1 YEAR	> 1 YEAR	SCORE	
EYE OPENING	Spontaneously	Spontaneously	4	
	To shout	To verbal command	3	
	To pain	To pain	2	
	No response	No response	1	
MOTOR RESPONSE	Spontaneous	Obeys	6	
	Localizes pain	Localizes pain	5	
	Flexion-withdrawl	Flexion-withdrawl	4	
	Flexion-abnormal (decorticate rigidity)	Flexion-abnormal (decorticate rigidity)	3	
	Extension (decerebrate rigidity)	Extension (decerebrate rigidity)	2	
	No response	No response	1	
0-23 MONTHS 2-5 YEARS >5 YEARS				
VERBAL RESPONSE	Smiles/coos appropriately	Appropriate words/phrases	Oriented	5
	Cries and is consolable	Inappropriate words	Disoriented/confused	4
	Persistent inappropriate crying and/or screaming	Persistent cries and screams	Inappropriate words	3
	Grunts, agitated, and restless	Grunts	Incomprehensible sounds	2
	No response	No response	No response	1
Total Pediatric Glasgow Coma Score (3-15):				

TBI Management per local resources

- If no PICU capability, consider early discussion with PTC and activation of transport resources for rapid transfer to PTC immediately if no operative lesion on head CT or from PACU if child undergoes craniotomy locally.

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