

# Head Trauma

#### History

- Time of injury
- Mechanism (blunt vs. penetrating)
- Loss of consciousness
- Bleeding
- Past medical history
- Medications
- Evidence for multi-trauma

### Signs and Symptoms

Age Appropriate

Airway Protocol(s) AR 1, 2, 3, 5, 6

- Pain, swelling, bleeding
- Altered mental status
- Unconscious
- Respiratory distress/ failure
- Vomiting
- Major traumatic mechanism of injury
- Seizure

## Differential

- Skull fracture
- Brain injury (Concussion, Contusion, Hemorrhage or Laceration)
- Epidural hematoma
- Subdural hematoma
- Subarachnoid hemorrhage
- Spinal injury
- Abuse

### Age Specific Blood Pressure indicating possible shock

Age 0 – 28 days: SBP < 60 Ages ≥ 1 month: SBP < 70 Age 1 – 9: SBP < 70 + (2*x* Age)

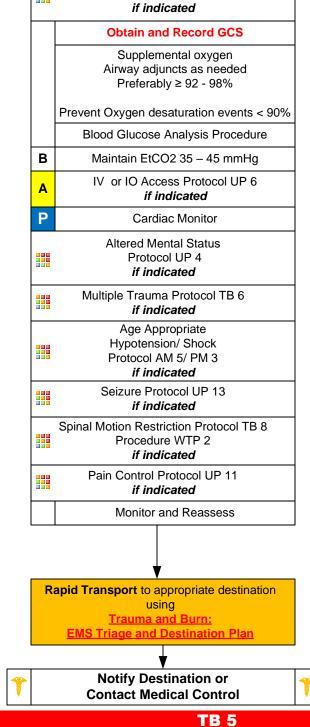
Ages 10 – 64: SBP < 90 Ages ≥ 65: SBP < 110

> All ages Shock Index: HR > SBP

#### <u>Hyperventilation:</u> Hyperventilation is NOT recommended in patients who require BVM, BIAD, or ETT.

Maintain ventilation rate to target EtCO2 of 35 – 45 mmHg See Pearls

Maintain oxygenation to target SpO2 of 92 – 98% (Near 100% if possible)





# **Head Trauma**

Pe	arls			
•	Recommended Exam: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremities,	Back, Neur	<b>b</b>	
•	<u>Hypoxia:</u>			
	Single episode of hypoxia can worsen head injury and double mortality.			
	Maintain SpO₂ preferrable between 92 – 98%, but 100% if possible.			
•	Hyperventilation in head injury requiring advanced airway:			
	Hyperventilation lowers CO2 and causes vasoconstriction leading to increased i	ntracranial	pressure (IC	P).
	Hyperventilation is not recommended and can worsen the brain injury.			-
	In patients requiring BVM, BIAD, or endotracheal tube, titrate ventilation rate to I	EtCO <sub>2</sub> betw	een 35 - 45 m	mHg.
	Recommended ventilation rates with advanced airways:			-
	Infant/ Toddler: 25 breaths / minute			
	Children: 20 Breaths / minute			
	Adolescents/ Adults: 10 – 12 Breaths / minute			
•	Hypotension:			
	Episodes of hypotension can worsen head injury and increase mortality:			
	In adults, target SBP is at least 90 - 100 mmHg.			
	In pediatrics, target SBP is at least > 70 + (2 x the age in years).			
	Usually indicates shock unrelated to the head injury and should be aggressively treated, otherwise limit fluid			
	administration.	Eye Opening		
•	GCS	Response	Verbal Response	Motor Response
	Key performance measure used in the EMS Acute Trauma Care Toolkit.	•	•	
	Serial assessments of GCG with ongoing assessments should be performed.	4 = Spontaneous 3 = To verbal stimuli	5 = Oriented 4 = Confused	6 = Obeys commands 5 = Localizes pain
•	Do not place in Trendelenburg position as this may increase ICP and worsen blood	2 = To pain	3 = Inappropriate words	4 = Withdraws from pai
	pressure.	1 = None	2 = Incoherent	3 = Flexion to pain or
•	Poorly fitted cervical collars may also increase ICP when applied too tightly.		1 = None	decorticate
•	In areas with short transport times, Drug Assisted Airway protocol is not			2 = Extension to pain or
	recommended for patients who are spontaneously breathing and who have			decerebrate 1 = None
	oxygen saturations of $\ge$ 90% with supplemental oxygen including BIAD/ BVM.			I = None
•	Increased intracranial pressure (ICP) may cause hypertension and bradycardia (Cus	hina's Resi	onse).	
•	Consider Restraints if necessary for patient's and/ or personnel's protection per the Restraints			ISP 5
•		NIS: PRVSICA	п Епосеобне с	
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	Concussions:			
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	<ul> <li><u>Concussions:</u> <ul> <li>Traumatic brain injuries involving any of a number of symptoms including confusion, lo vomiting, or headache.</li> <li>Any prolonged confusion or mental status abnormality which does not return to normal documented loss of consciousness should be evaluated by a physician ASAF</li> </ul> </li> </ul>	ss of consci within 15 m	ousness, inutes or any	
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