



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

- 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 Appropriate Airway Protocol(s) AR 1, 2, 3, 5, 6 <i>if indicated</i>
	Obtain and Record GCS
	Supplemental oxygen Airway adjuncts as needed Preferably ≥ 92 - 98%
	Prevent Oxygen desaturation events < 90%
	Blood Glucose Analysis Procedure
B	Maintain EtCO ₂ 35 – 45 mmHg
A	IV or IO Access Protocol UP 6 <i>if indicated</i>
P	Cardiac Monitor
	Altered Mental Status Protocol UP 4 <i>if indicated</i>
	Multiple Trauma Protocol TB 6 <i>if indicated</i>
	Age Appropriate Hypotension/ Shock Protocol AM 5/ PM 3 <i>if indicated</i>
	Seizure Protocol UP 13 <i>if indicated</i>
	Spinal Motion Restriction Protocol TB 8 Procedure WTP 2 <i>if indicated</i>
	Pain Control Protocol UP 11 <i>if indicated</i>
	Monitor and Reassess

Age Specific Blood Pressure indicating possible shock

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

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

All ages Shock Index:
HR > SBP

Hyperventilation:
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)

Rapid Transport to appropriate destination
using
**Trauma and Burn:
EMS Triage and Destination Plan**

**Notify Destination or
Contact Medical Control**



Head Trauma

Pearls

- **Recommended Exam: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremities, Back, Neuro**
- **Hypoxia:**
Single episode of hypoxia can worsen head injury and double mortality.
Maintain SpO₂ preferable between 92 – 98%, but 100% if possible.
- **Hyperventilation in head injury requiring advanced airway:**
Hyperventilation lowers CO₂ and causes vasoconstriction leading to increased intracranial pressure (ICP).
Hyperventilation is not recommended and can worsen the brain injury.
In patients requiring BVM, BIAD, or endotracheal tube, titrate ventilation rate to EtCO₂ between 35 - 45 mmHg.
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.
- **GCS**
Key performance measure used in the EMS Acute Trauma Care Toolkit.
Serial assessments of GCS with ongoing assessments should be performed.
- **Do not place in Trendelenburg position as this may increase ICP and worsen blood pressure.**
- **Poorly fitted cervical collars may also increase ICP when applied too tightly.**
- **In areas with short transport times, Drug Assisted Airway protocol is not recommended for patients who are spontaneously breathing and who have oxygen saturations of ≥ 90% with supplemental oxygen including BIAD/ BVM.**
- **Increased intracranial pressure (ICP) may cause hypertension and bradycardia (Cushing's Response).**
- Consider Restraints if necessary for patient's and/ or personnel's protection per the Restraints: Physical Procedure USP 5.
- **Concussions:**
Traumatic brain injuries involving any of a number of symptoms including confusion, loss of consciousness, vomiting, or headache.
Any prolonged confusion or mental status abnormality which does not return to normal within 15 minutes or any documented loss of consciousness should be evaluated by a physician ASAP.
EMS Providers should not make return-to-play decisions when evaluating an athlete with suspected concussion. This is outside the scope of practice.

Eye Opening Response	Verbal Response	Motor Response
4 = Spontaneous	5 = Oriented	6 = Obeys commands
3 = To verbal stimuli	4 = Confused	5 = Localizes pain
2 = To pain	3 = Inappropriate words	4 = Withdraws from pain
1 = None	2 = Incoherent	3 = Flexion to pain or decorticate
	1 = None	2 = Extension to pain or decerebrate
		1 = None