# Head Injury

**Signs of Herniation**[1]

- Decreasing mental status
- Abnormal respiratory pattern
- Asymmetric/unreactive pupils
- Cushing's reflex (elevated BP, bradycardia, & irregular breathing/apnea)
- Decorticate posturing (abnormal flexion)
  Decerebrate posturing (extension)

- Routine Trauma Care – including $SpO_2$, $EtCO_2$, CBG, and neurologic assessment
- Administer **Oxygen** 15L via NRB

Is patient GCS < 8 and/or $SpO_2$ <90% after 15L of oxygen?

**Yes**

- Reposition airway via jaw thrust; insert OPA/NPA
- Assist ventilations via BVM
- Limit neck/spine movement as much as possible

**No**

Does patient have signs of shock or SBP <90?

**Yes**

Give **Crystalloid Fluid** bolus 1L IV/IO once

Proceed to **Traumatic Shock** protocol

**No**

Perform ETT or insert SGA if $SpO_2$ remains <90% or GCS<8 persists (see **Airway Management** protocol)

Elevate head of bed to 30° to decrease ICP (this can be done with spinal motion restriction!)

**Promote cerebral perfusion**

(a) Maintain $EtCO_2$ 35-45 mmHg – avoid even mild hyperventilation!

(b) Avoid and treat hypotension – monitor for a dropping SBP

(c) Restrict IV Fluids if SBP ≥ 140 mmHg

(d) May Give **Midazolam** 2.5 mg IV/IO/ IM if patient is combative

Provider may to need to prepare for RSI if available/trained See RSI Protocol

Target SBP

Adults ($10^+$ yo): ≥ 110 mmHg

- Trend and document neurologic status during transport to hospital
- Monitor for signs of deterioration or herniation[1]
  - Consider potential for seizures
  - Initiate hyperventilation if s/s of herniation (target $EtCO_2$ 30-35); **Do not hyperventilate for "impending herniation"**

**Glasgow Coma Scale**

Any aspect of the score that cannot be tested should be noted as *NT* - e.g. GCS = E2, VNT, M4

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| **Best Eye Opening** | None | To Pain/Pressure | To Sound | Spontaneous | ----- | ----- |
| **Best Verbal Response** | None | Incomprehensible Sounds | Inappropriate Words | Confused | Oriented | ----- |
| **Best Motor Response** | None | Extension | Abnormal Flexion | Withdraws to Pain | Localizes to Pain | Obeys Commands |