

SYMPTOMS: Adult or pediatric patient with blunt or penetrating head injury. Loss of consciousness or amnesia not required.

### Assessment, Treatment, and Interventions

#### ALL LEVELS

1. Assure the scene is safe.
2. Maintain spine stabilization. See [Spinal Care guideline \[T-9\]](#).
3. Conduct primary survey per the [General Trauma Management guideline \[T-1\]](#).
4. Assess airway and breathing.
5. Control bleeding with direct pressure if no suspected open skull injury.
  - a. Apply moist sterile dressing to any potential open skull wound.
  - b. Cover an injured eye with moist saline dressing and place cup over it; cover other eye also.
6. Obtain vital signs and monitor frequently.
7. Assess neurological status (GCS and/or AVPU) to determine severity. (GCS chart following page.)
  - a. Mild: GCS 13-15 / AVPU = (A)
  - b. Moderate: GCS 9-12 / AVPU = (V)
  - c. Severe: GCS 3-8 / AVPU = (P) or (U)
8. Conduct secondary survey pertinent to isolated head injury.
  - a. Gently palpate skull to evaluate for depressed or open skull fracture.
  - b. Evaluate pupil size and reaction to light to establish baseline; reassess often.
  - c. Evaluate nose, mouth and ears for blood or other fluid drainage.
  - d. Evaluate face for bony stability.
  - e. Palpate neck for cervical spine tenderness or deformity.

#### EMR-O; EMT-R

9. Obtain blood glucose.
10. Conduct continuous monitoring of SpO<sub>2</sub>.
11. Administer oxygen as appropriate for dyspnea or distress with a target of achieving greater than 93% saturation for most acutely ill patients.
  - a. Consider use of BVM.
  - b. If patient unable to maintain airway, consider oral airway. (Nasal airway should not be used with significant facial injury or possible basilar skull fracture.)
  - c. Non-visualized airway may be used if BVM ventilation is ineffective in maintaining oxygenation, or if airway is continually compromised.
12. Apply continuous waveform capnography or ETCO<sub>2</sub> if moderate to severe head injury.
  - a. Target ETCO<sub>2</sub> measurement of 35-40 mmHg for patients who are unable to maintain their airway.
  - b. Hyperventilate patients with a severe head injury if signs of herniation (decreasing mental status, abnormal respiratory pattern, asymmetric or unreactive pupils, posturing, Cushing's response [bradycardia and hypertension]), to a target ETCO<sub>2</sub> of 30-35 mmHg.
  - c. Do NOT HYPERVENTILATE patient unless signs of herniation.
13. Repeat neurologic status assessment. (See 7 above.)
  - a. Early signs of deterioration include confusion, agitation, drowsiness, vomiting, severe headache.
  - b. Monitor for signs of herniation. (See 12.b. above)

c. If severe head injury – elevate head of cot 30 degrees.

14. Evaluate for other causes of altered mental status.

AEMT-R

15. Establish IV access.

a. Administer normal saline bolus 20 ml/kg to achieve the following:

i. Adult (age greater than 10 years): Maintain SBP greater than or equal to 110 mmHg.

ii. Pediatric: Maintain SBP:

1. Less than 12 months: greater than 60 mmHg

2. 1-12 months: greater than 70 mmHg

3. 1-10 years: greater than 70 mmHg + 2x age in years

b. Do not delay transport to initiate IV access.

INT-O; PARA-R

16. Interpret ETCO<sub>2</sub>.

17. Initiate oral endotracheal intubation if BVM ventilation is inadequate to maintain adequate oxygenation.

a. Target ETCO<sub>2</sub> of 35-40 mmHg.

b. If signs of herniation, hyperventilate to a target ETCO<sub>2</sub> of 30-35 mmHg.

### GLASCOW COMA SCORE

ADULT GCS		PEDIATRIC GCS	
Eye Opening (4)		Eye Opening (4)	
Spontaneous	4	Spontaneous	4
To speech	3	To speech	3
To pain	2	To pain	2
None	1	None	1
Best Motor Response (6)		Best Motor Response (6)	
Obeys commands	6	Obeys commands	6
Localizes pain	5	Localizes pain	5
Withdraws from pain	4	Withdraws from pain	4
Abnormal flexion	3	Abnormal flexion	3
Abnormal extension	2	Abnormal extension	2
None	1	None	1
Verbal Response (5)		Verbal Response (5)	
Oriented	5	Oriented	5
Confused	4	Confused	4
Inappropriate	3	Inappropriate	3
Incomprehensible	2	Incomprehensible	2
None	1	None	1
<b>Total</b>		<b>Total</b>	