SUBJECT: Traumatic Brain Injury (TBI) Protocol for Emergency Medical Services	**Chapter:** 2. Trauma
	Item: 2.7
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DISTRIBUTION: All Emergency Medical Services

PURPOSE: To provide guidance for the pre-hospital management of Traumatic Brain injuries (TBI)in both adults and children.

1. Identify mechanism of injury

2. Stabilize/secure airway, breathing, circulation

3. Neuro exam
    a. Assess pupils
        i. Asymmetric, difference > 1 mm
        ii. Unilateral or bilateral dilated and fixed pupils

    b. Assess gaze
    c. Assess posturing (extension/flexion)

    d. Assess GCS
        i. Go to an age appropriate neurosurgical capable center with immediately available CT and ability to monitor and treat intracranial pressure/hypertension for the following
            1. GCS ≤ 8
            2. Progressive loss of 2 points in GCS starting at initial score ≤ 13

    e. Hyperventilation if the following is present
        i. Response to nail bed pressure or axillary pinch with abnormal flexion or higher GCS motor response but have asymmetric and/or dilated fixed pupils→
            1. hyperventilate at 20 breaths/minute in adults,
            2. 30 breaths per minute in children, and
            3. 35-40 breaths/minute in infant < 12 months.
    f. Mannitol in the field is NOT recommended
    g. Analgesia/sedation
        i. Avoid long acting agents if possible and use short acting NMB's, benzodiazepines, etc (leave up to local EMS plans)

4. Assess oxygenation and systolic BP at least every 5 minutes
    a. Keep O2 sats > 90%
    b. Keep SBP > 90 mmHg in adults, 80 mmHg ages 6-12, 75mmHg ages 2 to 5, and 65 mmHg for ages 0-1 using isotonic crystalloid

5. Either ETCO2 or Capnography
    a. Goal ETCO2 30-35 mmHg

References:

Brain Trauma Foundation: Guidelines for Pre-Hospital Management of Traumatic Brain Injury; 2000.

Stiver, S., Manley, G., 2009. UCSF Department of Neurosurgery. Prehospital Management of Traumatic Brain Injury. Neurosurg. Focus 2008; 25(4):E5; American Association of Neurological Surgeons

Note: Developed by Trauma Task Force Protocol Work Group, 2009