

**PROCEDURE TITLE:
NEURO - NEUROLOGICAL MONITORING OF PATIENTS IN THE
EMERGENCY DEPARTMENT**

- I. **Purpose:** To establish a baseline and provide ongoing neurological assessment in the patient with altered mental status (AMS) and/or traumatic brain injury (TBI) thus, allowing for early identification of neurological change or decline

- II. **Statement of Policy:** The Registered Nurse will perform and record a neurological assessment and or changes in the patient's condition. The components of a neurological assessment include the Depth of Coma, Eye Signs, Movement, and Vital Signs.

- III. **Definitions:**
 - A. **Traumatic Brain Injury:** is defined as an acquired injury to the brain caused by an external physical force, resulting in total or partial functional cognitive and/or psychosocial impairment.
 - B. **Altered Mental Status (AMS):** is defined as a patient with a GCS <15 and/or with symptoms of perseveration, inappropriateness, or agitation

- IV. **Procedure:**
 - A. **Supportive Data:** Cerebral perfusion and neurological function of the patient with AMS and/or TBI may be assessed using the mnemonic **D-E-M-V**. The baseline and ongoing reassessment of the following parameters may be used to identify improvement or deterioration in neurological status
 - i. **D:** Depth of Coma (Assess using the Glasgow Coma Scale-GCS)
 - ii. **E:** Eye Signs (Pupillary size and reaction)
 - iii. **M:** Movement (Bilateral comparison of all four extremities)
 - iv. **V:** Vital Signs (Blood pressure, heart rate, respiratory rate, oxygen saturation)
 - B. **Equipment Needed for Examination:**
 - i. Penlight
 - ii. Sphygmomanometer with B/P cuff
 - iii. Stethoscope
 - iv. Oxygen saturation monitor
 - C. **Baseline Assessment**
 - i. **Depth of Coma:** Assess using the Glasgow Coma Scale. The GCS is a stimulus-response tool designed to assess a patient's arousability and cognition (See Table 1)
 1. **Components of the Glasgow Coma Scale (GCS)**
 - a. **Best** Eye Opening
 - b. **Best** Motor Response
 - c. **Best** Verbal Response
 - ii. **Eye Signs:** Assess pupillary size, shape and reactivity to light

iii. **Motor:**

1. **Conscious and Cooperative Patients:** Use the following scale to assess limb movement and strength. Assess by asking the patient to pull limb in opposition to examiner. The motor exam should include but is not limited to the bilateral assessment of the follow muscle groups; biceps, grip/intrinsics, quadriceps, tibialis anterior, gastrocnemus
 - a. **5:** Normal Strength
 - b. **4:** Movement against resistance
 - c. **3:** Movement against gravity
 - d. **2:** Movement with gravity eliminated
 - e. **1:** Contraction of the muscle only
 - f. **0:** No movement
2. **Altered Cognition or Uncooperative Patients:** If the patient is unable to respond or cooperate with detailed testing utilizing the above scale a painful stimuli should be applied and movement should denoted on the Glasgow Coma Scale. Observe for lateralizing signs

D. Serial Reassessment

- i. If the patient has suffered a mechanism consistent with sustaining a TBI and is without altered mentation and/or a period of unconsciousness and a Head CT has yet to be performed, he/she should undergo a baseline neurological examination upon initial arrival to the ER and then hourly for four consecutive hours followed by every two hours assessments until discharge, using the D-E-M-V criteria
- ii. If the patient has suffered a mechanism consistent with sustaining a TBI and has experienced an alteration in mentation and/or a period of unconsciousness and a Head CT has yet to be performed, he/she should undergo a baseline neurological examination upon initial arrival to the ER and then hourly for four consecutive hours followed by every two hours assessments until discharge, using the D-E-M-V criteria
- iii. If the patient has evidence of a traumatic brain injury on Head CT and is without altered mentation and/or a period of unconsciousness, he/she should undergo a baseline neurological examination upon initial arrival to the ER and and then hourly for four consecutive hours followed by every two hours assessments until discharge, using the D-E-M-V criteria or as otherwise determined by the Neurosurgical and/or ER Physicians
- iv. If the patient has evidence of a traumatic brain injury on Head CT and has or is currently experiencing an alteration in mentation or consciousness he/she should undergo a baseline neurological examination upon initial arrival to the ER and then and then hourly until discharge, using the D-E-M-V

E. **Notification Parameters:** The ER Physician and/or Neurosurgical team should be notified immediately for the following:

- i. Change in vital signs from the parameters indicated in the physician orders
- ii. Decrease in arousability
- iii. Increased restlessness
- iv. Decrease in motor response
- v. Seizure activity
- vi. Change in speech
- vii. Change from a state of orientation to a state of confusion
- viii. Change in pupil size and reaction
- ix. Change in limb movement or strength
- x. Subjective report of a change or decrease in sensory stimulation

V. **Documentation:**

- A. The **D-E-M-V** and any physician contact/conversation will be documented on the Emergency Nursing Care Flow Record or Trauma Nursing Flow Sheet as appropriate.