### What is patient's Glasgow Coma Scale (GCS)?

**GCS 13-15**
- **Minor Head Injury**
  - CT urgently needed if all 3 of the following:
    1. History of blunt head trauma within the last 24 hours
    2. History of loss of consciousness, amnesia or disorientation
    3. One or more of the following:
       - GCS < 15 at 2 h after injury
       - Suspected open or depressed skull fracture
       - Sign of basal skull fracture (hemotympanum, "raccoon eyes", cerebrospinal fluid otorrhoea, Battle's sign)
       - Vomiting x 2 or more times
       - Age > 65

  **Minor Head Injury Management**

- Abnormal CT
  - Call Air Medical Critical Care Transport and Trauma Hotline at 1-800-743-1334

- Normal CT or no CT indicated
  - Observe until well and discharge home
  - Follow up with primary care physician

If GCS deteriorating, or evidence of penetrating head injury, treat as per "Major Head Injury"

**GCS 3-12**
- **Major Head Injury**
  - Intubate (c-spine in neutral position) for GCS ≤ 8 or deteriorating GCS; oxygen by mask for all others
  - Spine immobilization (c-spine collar and backboard)

  **2 minute neurological assessment:**
  - GCS
  - Pupil size and reaction to light
  - Biceps and knee jerk reflexes
  - Babinski responses
  - Gross motor function (equal movement in all 4 limbs?)

**PEDIATRIC HEAD INJURY (AGE < 16 YEARS)**

- **GCS 3-12** (Major Head Injury)
  - Treat as per adult guideline

- **GCS 13-15** (Minor Head Injury)
  - **AGE 2-15 years:**
    - GCS 13 or 14: **CT Head**
    - GCS 15:
      - History of LOC or PTA: **CT Head** or observe overnight
      - No LOC or PTA: **CT Head** if one or more of the following:
        - Change in GCS
        - Focal neurologic deficit
        - Intoxication
        - Clinical evidence of skull fracture
        - History of coagulopathy

  **AGE <2 years:** (Consider child abuse as cause)
  - Symptomatic and/or neurologically abnormal: **CT Head**
  - Asymptomatic and normal neuro exam: No further imaging studies except if <1 year and scalp hematoma, then do skull x-rays
    - If x-rays normal: No further investigations
    - If fracture: **CT Head** & contact neurosurgery

  **Symptomatic:** LOC, vomiting, drowsy, irritable
  **PTA:** Loss of consciousness
  **CT:** Computed tomography

### Calculate Glasgow Coma Scale (E + V + M; Range 3-15)

<table>
<thead>
<tr>
<th>EYE OPENING</th>
<th>VERBAL RESPONSE</th>
<th>BEST MOTOR RESPONSE</th>
<th>BEST MOTOR RESPONSE</th>
<th>VERBALIZATION</th>
<th>EYE OPENING</th>
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<tbody>
<tr>
<td>BEST</td>
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<tr>
<td>4. Spontaneously</td>
<td>6. Follows motor commands</td>
<td>2. Extension of all extremities to painful stimuli</td>
<td>5. Appropriately for age fixes and follows, social smile</td>
<td>4. Spontaneously</td>
<td>3. To voice</td>
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<tr>
<td>3. To voice</td>
<td>5. Localizes</td>
<td>4. Only withdraws arm or leg (withdrawal)</td>
<td>4. Cites, but constable</td>
<td>3. To pain</td>
<td></td>
</tr>
<tr>
<td>1. Not at all</td>
<td>3. Abnormal flexion</td>
<td>2. Abnormal extension</td>
<td>1. None</td>
<td>1. None</td>
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<table>
<thead>
<tr>
<th>GCS for age &gt; 5 years</th>
<th>GCS for age &lt; 5 years</th>
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<tbody>
<tr>
<td>E = 1-4</td>
<td>E = 1-4</td>
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<tr>
<td>V = 1-5</td>
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<td>M = 1-6</td>
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