Traumatic Brain Injury: Screening and Assessment Overview

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Disclosure

none
Background and Definitions

- How is TBI defined?
- Glasgow Coma Scale
# Background and Definitions

## Table 1: THE GLASGOW COMA SCALE AND SCORE

<table>
<thead>
<tr>
<th>Feature</th>
<th>Scale Responses</th>
<th>Score Notation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye opening</td>
<td>Spontaneous</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>To speech</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>To pain</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>1</td>
</tr>
<tr>
<td>Verbal response</td>
<td>Orientated</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Confused conversation</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Words (inappropriate)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Sounds (incomprehensible)</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>1</td>
</tr>
<tr>
<td>Best motor response</td>
<td>Obey commands</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Localise pain</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Flexion – Normal</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>– Abnormal</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Extend</td>
<td>2</td>
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**TOTAL COMA ‘SCORE’**

3/15 – 15/15
## Background and Definitions

- **How is TBI defined?**

- **Glasgow Coma Scale**

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<th>GCS</th>
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GCS: Glasgow Coma Scale
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#### TBI Severity and GCS Scores

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Definition of Mild TBI

- GCS > 13
- No LOC or LOC less than 30 min
- Posttraumatic amnesia less than 24 hours
- No focal neurological signs on exam

AAN definition:

- “A trauma induced alteration in mental status that may or may not include a loss of consciousness.”
Mild TBI
A.K.A. Concussion

- Symptoms:
  - Vacant stare
  - Delayed verbal or motor responses
  - Confusion and inability to focus
  - Disorientation
  - Slurred/ incoherent speech
  - Incoordination
  - Memory deficits
  - Any period of loss of consciousness (occurs in only 9%)
Blast Injury

Blast-Related Mild Traumatic Brain Injury: Mechanisms of Injury and Impact on Clinical Care

Gregory A. Elder, MD and Adrian Cristian, MD

Rehabilitation Medicine Service, James J. Peters Department of Veterans Affairs Medical Center, Bronx, NY
Blast Injury

- Blast injury is the most common cause of TBI in OIF and OEF veterans
  - Primary blast injury: from blast overpressure wave (ruptured TM)
  - Secondary: propulsion of objects striking service member
  - Tertiary: Striking a solid object
  - Quaternary: heat injury or inhalation of gasses

Blast injury pathology resembles that of mild TBI, including diffuse axonal injury
Video
Diffuse Axonal Injury

- Occurs as a result of acceleration/deceleration or rotational forces
  - Shearing forces affect the white matter tracts
- Greater than 50% of severe TBI cases have evidence of DAI
  - Common cause of unconsciousness/coma
  - 90% with severe DAI never regain consciousness
- Not easily detected on imaging studies
Diffuse Axonal Injury
Postconcussive Syndrome

- Three domains
  - Somatic
    - Headache, fatigue, sleep disturbance, balance
  - Emotional/behavioral
    - Irritable, frustrated, depression, anxiety, personality changes
  - Cognitive
    - Slowed thinking, distractibility, poor learning and memory

- Lasting up to 3 months
  - Most recover within weeks
  - Up to 15% can have long lasting or permanent symptoms

- Due to a change in neurological function rather than physiology
PTSD

- **Re-experiencing the traumatic event**
  - Intrusive memories of the event
  - Flashbacks
  - Nightmares
  - Intense physical reactions to reminders of the event

- **Symptoms of avoidance and emotional numbing**
  - Avoiding activities, places, thoughts, etc
  - Loss of interest in activities and life in general
  - Feeling detached from others and emotionally numb
  - Sense of a limited future

- **PTSD symptoms of increased arousal**
  - Difficulty falling or staying asleep
  - Irritability or outbursts of anger
  - Difficulty concentrating
  - Hypervigilence
  - Feeling jumpy and easily startled
TBI
- Headache
- Dizziness
- Memory problems

PTSD
- Fatigue
- Insomnia
- Concentration
- Depression
- Anxiety
- Flashbacks
- Nightmares
- Hypervigilant
Substance Abuse

- Between 27% and 50% of TBI survivors abuse substances
  - 95% is alcohol abuse
- Alcohol and drugs exacerbate TBI symptoms
  - Dizziness, cognitive problems
- Alcohol and drug abuse often results in re-injury
Suicide and TBI

- TBI survivors have a four-fold increase risk of suicide

- Suicide risk is modified by
  - Psychiatric disease
  - Emotional disturbance
  - Substance abuse
Approach to Assessment

- Neurology
- Family
- Neuropsych
- Psychiatry
- Education
- Case Mgmt