Traumatic Brain Injury 101: An overview

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Big Picture Outline

I. Neuroanatomy and neurophysiology

II. Defining Brain Injury
   1. Acquired Brain Injury (ABI) versus Traumatic Brain Injury (TBI)
   2. Severity of injury classification
   3. Mechanism of injury
   4. Primary and secondary injuries

III. Common Sequelae after TBI and trajectory

IV. Mild (m) TBI (Concussion) – myth versus fact

IV. mTBI (Concussion) – Myth Versus Fact
Severity Classification

Mild
- Head injury
- Loss of consciousness (LOC)
- Glasgow Coma Scale (GCS) 13-15
- Post-traumatic Amnesia (PTA) <24 hours

Myth Versus Fact 1
- mTBI only occurs when there is a loss of consciousness or you get “knocked out”
- mTBIs can occur with or without losing consciousness

Myth Versus Fact 2
- After a concussion, you need to refrain from all activity.
- After a few days rest, there is actually research to suggest
Myth versus Fact 3

- Helmets make you concussion proof
- Helmets are designed to prevent skull fractures, not concussions.

Myth versus Fact 4

- Concussions all resolve in a week.
- Every concussion is different, and each child is different. Some improve in a day or two, but it’s not uncommon for it to take weeks or months to recover from a concussion.

Common Symptoms of Concussion

<table>
<thead>
<tr>
<th>Physical Symptoms</th>
<th>Thinking Symptoms</th>
<th>Sleep Symptoms</th>
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<tbody>
<tr>
<td>Headaches</td>
<td>Feeling mentally foggy</td>
<td>Drowsiness</td>
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<tr>
<td>Nausea</td>
<td>Problems concentrating</td>
<td>Sleeping more than usual</td>
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<tr>
<td>Fatigue</td>
<td>Problems remembering</td>
<td>Sleeping less than usual</td>
</tr>
<tr>
<td>Visual problems</td>
<td>Feeling more slowed down</td>
<td>Trouble falling asleep</td>
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<tr>
<td>Balance problems</td>
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<tr>
<td>Sensitivity to light</td>
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<td>Sensitivity to noise</td>
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<tr>
<td>Numbness/tingling</td>
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<tr>
<td>Vomiting</td>
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<tr>
<td>Dizziness</td>
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- Emotional Symptoms
- Irritability
- Sadness
- Feeling more emotional
- Nervousness

- Preschoolers (Rane et al.)
- Enuresis
- Behavioral changes
- Nightmares
- Stomachaches
Most reported symptoms

- Headache – number 1 reported symptom
- Nausea
- Dizziness
- Disorientation/Mental status changes
- LOC
- PTA
- Vomiting

Clinical Considerations

Factors that Impact TBI
TBI symptoms can overlap with other conditions

- Headache
- Sensitivity to light or noise
- Vision problems
- Dizziness
- Fatigue
- Insomnia
- Cognitive Deficits
- Irritability
- Tension
- Avoidance
- Flashbacks
- Hypervigilance
- Nightmares

Guidelines for management of mTBI

- For mTBI there is a consensus statement (McCrory et al., 2016 and new CDC guidelines published in JAMA Pediatrics September 2018) that provide information on diagnosis and management

Management of mTBI

- Importance for health care professionals to monitor recovery and provide recommendations for:
  - Sleep
  - Return to physical activity
  - Return to cognitive activity
  - Return to school
  - Education about recovery process
Summary

- A concussion is a type of TBI and referred to as a mild TBI
- It is important to know that people experience a range of symptoms and timeline for recovery and return to activities
- Returning to cognitive and physical activity should be done gradually and if necessary under the guidance of professionals
  - Pacing is recommended as tolerated by symptoms
- Research is ongoing
  - To determine ideal duration and intensity of rest AND
  - For recommendations regarding timing of introducing cognitive and physical activity

Upcoming segments

- Educational management of students with TBI
- Things to consider about the special education process
- Best teaching practices