Traumatic Brain Injury: An often unrecognized co-occurring behavioral health disorder

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Brain Injury Quiz

Areas of the brain (side view)

- **Frontal lobe**: Planning/reasoning, problem-solving, recognising and regulating emotion, social skills.
- **Parietal lobe**: Recognising sensations and body position, recognising objects, spatial judgements, understanding time.
- **Temporal lobe**: Understanding language, processing auditory information, organising information, memory, learning.
- **Occipital lobe**: Integrating and processing visual information (colour, shape, distance).
- **Brain stem**: Regulates breathing, body temperature, heart activity etc.
- **Cerebellum**: Controls balance and muscle co-ordination.
How many Americans sustain a TBI annually?

- 231,840
- 1.7 million
- 1.2 million
How much does the adult brain weigh?

- 7 pounds
- 3 pounds
- 1.5 pounds
At what age on average does the adult brain mature?

- 18
- 21
- 25
What is the last part of the brain to mature?

- Frontal lobe
- Temporal lobe
- Parietal lobe
True or False.....

- If a person accurately states their name and the date after a blow to the head, it is safe to assume they will be fine.

- TBI is a chronic health condition

- The impact of childhood TBI may not become apparent until years later
Bonus Question- The frontal lobe develops first in males or females?
Today’s discussion will focus on the Behavioral Health Implications of Brain Injury, however there are some clues you can look for in other areas of functioning that may indicate an individual is living with a history of brain injury.
<table>
<thead>
<tr>
<th>Somatic Signs and Symptoms</th>
<th>Headache, fatigue, sleep disturbance, chronic pain</th>
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<tbody>
<tr>
<td>Motor Health Effects</td>
<td>Changes in muscle tone, paralysis, impaired coordination, changes in Balance or trouble walking</td>
</tr>
<tr>
<td>Sensory changes</td>
<td>Changes in vision, hearing and sensitivity to light</td>
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From the CDC’s Report to Congress on TBI Epidemiology & Rehabilitation 2015
Definitions

- Traumatic Brain Injury is an insult to the brain caused by an external physical force.
- Diffuse Axonal Injury the tearing and shearing of microscopic brain cells.
- Acquired Brain Injury is an insult to the brain that has occurred after birth, for example: TBI, stroke, near suffocation, infections in the brain, anoxia.
Skull Anatomy

The skull is a rounded layer of bone designed to protect the brain from penetrating injuries.

The base of the skull is rough, with many bony protuberances.

These ridges can result in injury to the temporal and frontal lobes of the brain during rapid acceleration.
The Frontal Lobe

The frontal lobe is the area of the brain responsible for our “executive skills” - higher cognitive functions.

These include:

- Problem solving
- Spontaneity
- Memory
- Language
- Motivation
- Judgment
- Impulse control
- Social and sexual behavior.
The temporal lobe plays a role in emotions, and is also responsible for smelling, tasting, perception, memory, understanding music, aggressiveness, and sexual behavior.

The temporal lobe also contains the language area of the brain.
Remaining lobes their functioning-in brief:

- **Parietal**: The parietal lobe plays a role in our sensations of touch, smell, and taste. It also processes sensory and spatial awareness, and is a key component in eye-hand co-ordination and arm movement. The parietal lobe also contains a specialized area called Wernicke’s area that is responsible for matching written words with the sound of spoken speech.

- **Occipital**: The occipital lobe is at the rear of the brain and controls vision and recognition.
The January-February 2015 issue of the Journal of Head Trauma Rehabilitation reports:

“A sizable majority of Iraq and Afghanistan combat veterans who experienced incident TBI while deployed prior to 11.06 are likely to have had their injuries undocumented …”

The study estimates that 21,257 active personnel experienced undocumented TBI between 1.03 & 10.06
USA Today’s Gregg Zoroya reports:

A new study by Hopkins researchers suggests: that lesions caused by exposure to blast in the brains OEF/OIF veterans is different than damage to the brain incurred via MVAs, sports or drug overdose

Damage was noted in the area of the brain associated with executive functioning.

“Lasting damage to this area can cause moodiness, difficulty processing thoughts, memory problems, personality changes and impulsivity” Vassilis Koliatsos MD 2015
Individuals with a history of Brain Injury are found among...

- The Incarcerated
- The Homeless
- Those who have served in the military
- Victims and Perpetrators of Domestic Violence
- Individuals with behavioral health disorders
The TBI & Homelessness Connection

- 2008 CMJ- Of 904 individuals surveyed, 53% lifetime prevalence of TBI. *Hwang et. al*
- 2014 CMJ- 111 men screened, 45% screened positive for hx of TBI. 73% had 1st TBI before adulthood, for 87% that injury predated homelessness. Mechanism of injury; assault, sports/recreation, MVA, fall. Positive screen (+) associated with history of arrest or mental illness and parental hx of substance abuse. *Topolovec-Vranic et. al*
The TBI & Homelessness Connection

2015 J. of Health Care for Poor & Underserved-
Of 229 veterans seeking homeless services, nearly all 83% had sustained at least 1 TBI prior to first episode of homelessness. 43% sustained at least 1 TBI following first episode of homelessness. Median lifetime # of TBI’s incurred was three. 30% of individuals sustained injuries with severity levels that would be expected to be associated with ongoing TBI-related deficits Barnes et. al.
# Possible Changes in Thinking, aka Cognitive Skills

<table>
<thead>
<tr>
<th>Injury related problem</th>
<th>How it may affect a person functionally….</th>
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<tbody>
<tr>
<td>Memory</td>
<td>Trouble following directions, providing requested information, making appointments</td>
</tr>
<tr>
<td>Processing (receptive)</td>
<td>Understanding what being said, reading</td>
</tr>
<tr>
<td>Processing (expressive)</td>
<td>Trouble putting thoughts into words, tip of the tongue syndrome</td>
</tr>
<tr>
<td>Frontal lobe &amp; temporal tip injury</td>
<td>Impulsive, easily frustrated, sexually disinhibited, verbally/physically combative, interpersonally inflexible, poorly organized</td>
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Possible Changes in Personality & Behavior

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<td>Depression</td>
<td>Flat affect, lack of initiation, sadness, irritability</td>
</tr>
<tr>
<td>Unawareness</td>
<td>Unable to take social cues from others</td>
</tr>
<tr>
<td>Confabulation</td>
<td>“making up stories”</td>
</tr>
<tr>
<td>Perservation</td>
<td>Gets “stuck” on a topic of conversation or physical action</td>
</tr>
<tr>
<td>Anxiety</td>
<td>Can exacerbate other cognitive/behavioral problems</td>
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“Unidentified traumatic brain injury is an unrecognized major source of social and vocational failure”

Wayne Gordon, Ph.D of the Brain Injury Research Center at Mount Sinai School of Medicine
Quoted in the Wall Street Journal 1.29.08
Screening for a History of TBI

http://ohiovalley.org/tbi-id-method/
Once you know there is a TBI, What do you do about it?

Strategies & Accommodations
Accommodating the Symptoms OF Brain Injury

http://ohiovalley.org/informationeducation/accommodatingtbi/accommodationspresentation/
“What helps you with...?"

- Learning new material
- Remembering assignments
- Staying on Track
- Figuring out how to do new things
- Making choices that keep you healthy and safe
Notice the person “checks out”
- Thrill seeking and risk taking behavior is observed/reported
- Seeks sensory stimulation
- Often appears bored or disinterested (as a consequence, professionals and peers may find the individual difficult to engage, or “self-centered”)

Clues that focusing, keeping, and/or splitting and dividing attention is a challenge....
To Enhance Attention

- Grab Attention
- Break it Down
- Hands On
What can be done:

- Verbal and nonverbal signals that a task/activity/discussion is about to start
- Use a ice breaker
- Provide a graphic organizer, or “coming attraction” graphic organizer
- Put day’s group discussion topics/agenda on the board or flip chart
- Give all permission at onset to get up and stretch as needed
Inconsistent performance of tasks or daily activities

Difficulty with recall, especially of new information

Appears inattentive

Lacks follow-through

Is “forgetful”
To Enhance Memory

- Structure the environment
- Repetition of information, to promote procedural memory
What can be done

- Write information down
- Review, Rehearse, Repeat
- Use of compensatory strategies such as; use of a calendar, alarms, smart devices, create a daily schedule, "To do" lists and shopping lists, Labeling items
Strategies

- Use of a journal/calendar
- Create a daily schedule
- “To do” lists and shopping lists
- Labeling items
- Learning to break tasks into small manageable steps
- Use of a digital recorder/smart phone app
- Encourage use of rest and low activity periods, naps are to be encouraged!
- Work on accepting coaching from others
- Work on generalizing strategies to new situations
- Use of a high lighter (RED)
- Alarms (on phone, watch, PDA) to move through the day
Strategies cont.....

- Use of a template for routine tasks, on the job, at home, in the community
- Use of ear plugs to increase attention, screen out distractions (Parente & Herman 1996)
- Partitions/cubicles, at work, quiet space at home
- Model tasks e.g. turning on a computer and accessing email etc.
Strategies cont.....

- Use of pictures, for faces/names, basic information, for step-by-step procedures, e.g. making coffee
- Use of a timer, to track breaks at work, the time minimum technique, allocated time to puzzle over a problem or vent a frustration
- Audio books, movies, keep the subtitles (for processing content in the case of memory and comprehension problems and increase awareness of nonverbal cues/communication)
Be aware that many strategies & accommodations can support several issues concurrently; using strategies suggested for memory issues may also support initiation, planning and organizing as well as addressing mental flexibility and self-awareness.
“What if There is a Traumatic Brain Injury?”

John Corrigan PhD

This one hour archived webinar is a highly recommended overview of TBI & its possible Behavioral Health Consequences

Director, Ohio Valley Center for Brain Injury Prevention and Rehabilitation, The Ohio State University; Columbus, Ohio.

http://ohiovalley.org/informationeducation/whatif/index.cfm
Resources

- Brain Injury Association of America: www.biausa.org
- Brainline, www.brainline.org Website funded through the Defense and Veterans Brain Injury Center offers civilians, returning service members with brain injury, families and professionals a variety of information and resources regarding life after brain injury.
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Thank you!