

The Intersection of Issues: Traumatic Brain Injury, Mental Health and Crisis Intervention

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Over the Last 30 Years...

- Scientists, physicians and therapists have learned a great deal about the brain's response to injury and how to optimize the outcomes of those persons who survive traumatic brain injury (TBI)
- Mortality has decreased
- Morbidity has increased
- Brain injury has become a silent and mostly unrecognized public health epidemic

We've gotten much better at recognizing Mild TBI

Did You Know...

- Males generally sustain more brain injuries than females
- Females often have worse outcomes
- CT scans are negative in 45% of studies
- Direct medical costs and indirect annual expenditures (lost productivity) total an estimated \$60 billion in the United States
- In one study, 66% of kids who fell from shopping carts in one year were treated for head injuries; 54 % (or 5,940 per year) of those children sustained at least a concussion
- As many children go to the ER with a broken bone as with a brain injury
(National Pediatric Trauma Registry, 2003)

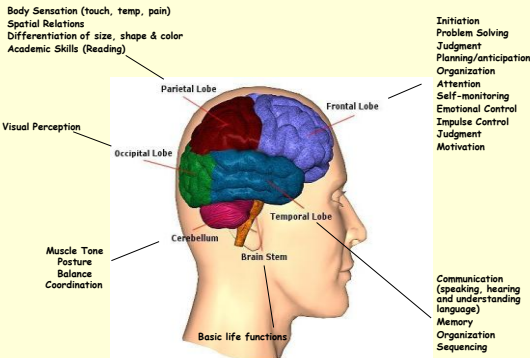
Incidence, Prevalence and Epidemiology

- CDC reports that each year:
 - 1.1 million people are treated and released from hospital emergency departments
 - 290,000 people are hospitalized and survive
 - 475,000 are children 0-14
 - 51,000 people die
- Nearly 85,000 Virginians and 3.17 million Americans are living with a long term disability as a result of traumatic brain injury
- After a TBI, the risk for a second injury is THREE times greater; after a second TBI, the risk for a third injury is EIGHT times greater

TBI is Not an Event or a Final Outcome

- It is the beginning of a pathological process that impacts multiple organ systems: endocrine, immune, vision, genitourinary, musculoskeletal.
- It is disease causative and disease accelerative
 - Those surviving *more* than one year with a TBI are 37 times more likely to die from seizures, 12 times more likely to die from septicemia, 4 times more likely to die from pneumonia and 3 times more likely to die from other respiratory conditions than a matched general population cohort
 - Risk factor for epilepsy, sleep disturbances, psychiatric disease, Alzheimer's disease, chronic traumatic encephalopathy
- It shortens the life span
 - Life expectancy reduction of seven years for those with moderate to severe TBIs
 - Even individuals with mild TBIs have been found to have a small but statistically significant reduction in long-term survival
(Masel et al, 2008)

This Is Your Brain



Primary Mechanisms of TBI

Biomechanical Injury

- acceleration - deceleration
- translational/rotational
- cavitation (“microexplosive”)
- diffuse axonal injury (DAI)

Cytotoxic Injury

- axonal swelling
- metabolic disruption, diminished blood flow create energy crisis
- neurotransmitter excitotoxicity

Secondary Mechanisms of TBI

- Traumatic Hematomas
- Cerebral Edema
- Increased Intracranial Pressure (ICP)
- Systemic Complications
 - hypoxia/hypercapnia
 - hypotension
 - infection
 - dysautoregulation

Mild TBI

- 1.4 million brain injuries annually in the US
- Between 75%-85% (1.0 to 1.2 million) are estimated to fall into the mild range
- May or may not experience loss of consciousness; not likely to be hospitalized for their injury
- May experience problems for several months before their symptoms clear, but most eventually recover completely
- 15% of them will experience chronic cognitive, emotional, behavioral and physical problems
- 20% or 208,200 are attributed to sports
 - 97,988 (34%) do not see MD
 - 158,510 (55%) receive virtually single service OP care (ER, MD visit)
 - 31,702 (11%) were hospitalized

Psychological Symptoms of Mild TBI

- Irritability
- Anxiety
- Depression
- Indifference
- Inflexibility
- Emotional instability
- Family stress
- Loss of self esteem

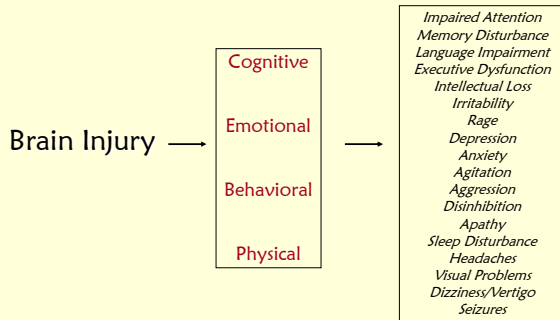
“No cardiologist ignores a ‘mild’ heart attack. He or she doesn’t say to the patient, ‘Don’t worry about exercise or your diet unless the heart attack is severe’. Yet we don’t treat a concussion the same way as we do a heart attack. For some reason we tell people ‘You’re fine’ when we know they aren’t.”

Dr. Heechin Chae

Moderate to Severe TBI

- 15-25% of brain injuries
- Usually sustain some alteration of consciousness
- Typically hospitalized, appropriately diagnosed
- Most receive follow-up care through the medical system
- Most receive inadequate rehabilitation (if they get any at all) resulting in chronic disability and a lifetime of poverty.

TBI Produces Cognitive, Emotional, Behavioral, and Physical Disturbances



Cognitive Impairments and Behavior

Persons with brain injury:

- Struggle to attend to what's important in their environment
- Have difficulty initiating activity, or stopping it once they've started
- Can be impulsive, and have great difficulty inhibiting their behavior
- May lack insight into the impact of their behavior on others, and have limited ability to see another perspective
- Frequently fail to understand what is expected of them, or cannot remember long enough to carry out what is expected
- May be unable do what's being asked of them, so they engage in other behavior

Personality Changes in Frontal Trauma

- Impulsivity
- Apathy
- Self-centeredness
- Impaired self-awareness
- Impaired communication
- Inability to shift cognitive sets
- Poor use of previously acquired strategies

Brain Injury and Mental Health

- Psychiatric and psychological deficits are amongst the most disabling consequences of a TBI
- A traumatic brain injury clearly may cause decades long, and possibly permanent vulnerability to psychiatric illness
- Evidence exists that neurotransmitters with important roles in modulating mood, motivation, impulse control and aggression are altered after TBI
- Many individuals with a mild TBI, and the overwhelming majority of those who survive a moderate-severe TBI, are left with significant long term neurobehavioral sequelae

Psychiatric Complications

- Of 254 individuals 2 and 5 years post TBI, a higher incidence of cognitive, behavioral and emotional changes was found at 5 years than at 2 years post TBI. *(Oliver, 1996)*
- TBI is associated with higher rates of suicidal ideation, suicidal plans or behaviors and completed suicide *(Mazel, 2008)*
- In one study of 60 individuals 30 years post injury:
 - 50% developed a major mental disorder that began after their TBI
 - 11% developed a major mental disorder later on in their lifetime
 - 23% developed a personality disorder *(Kaponen, 2002)*
- In chronic TBI, the incidence of psychosis is 20%; prevalence of depression is 18-61%, mania is 1-22%, PTSD is 3-59%, and post TBI aggression is 20-40%. *(Kim, 2007)*
- Compelling evidence of TBI causation for depression, anxiety and Bipolar Affective Disorders *(Van Reekum, 2000)*

Do Psychiatric Disorders Increase the Risk of a TBI?

- Psychiatric illness and subsequent TBI: A case control study
- 450,000 members of HMO in Washington
- TBI in 1,993 – 1,440 of which (90%) were mild
- Psychiatric illness indicators: diagnosis, medications, treatment *(Fann, 2002)*

Findings

- Relative risk for TBI was 1.3 - 4 times higher in individuals with a preceding psychiatric diagnosis
- Average risk: 24.2% in TBI population vs 14.3% in control group
- 9.1% of TBI cases attributable to psych diagnosis
- Highest risk for those 25-64

New Haven Epidemiologic Study Lifetime Prevalence of Psychiatric Disorders: TBI vs Community: Axis I

	Pre TBI	Post TBI	Community
Major Dep.	17%	58%	6%
SA Disorder	38%	16%	17%
PTSD	6%	18%	8%
OCD	1%	14%	3%
Panic	4%	11%	2%
GAD	1%	8%	4%
Phobias	4%	6%	13%

(Bourdon, 1992)

TBI and Depression in Veterans

- WWII veterans: 520 with TBI; 1,198 no TBI
- F/U 50 years after injury
- Lifetime prevalence: 18.5 v 13.4%
- Current depression: 11.2 v 8.5%
- Risk increased with severity of TBI

(Holsinger, 2002)

Correlations between TBI, Schizophrenia and Bipolar Disorder

- People with family histories of schizophrenia, even those without a schizophrenia diagnosis, had greater exposure to TBI compared to those with family histories of bipolar disorder.
- Within those with a family history of schizophrenia, TBI was associated with a greater risk of schizophrenia, consistent with synergistic effects between genetic vulnerability for schizophrenia and TBI

(Malaspina, 2001)

Think About It....

- The rate of head injury among the homeless may be as high as 24 %, compared to 1% in the general population *(Petrenchik, 2006)*
- Studies of the prevalence of brain injury among incarcerated adults found rates between 25- 92% *(Diamond, 2006)*
- The Virginia Department of Juvenile Justice numbers of children in their system with brain injury are in the 20-30% range

TBI Associated with Increased Risk of Developing Psychiatric Diseases

- Mood and Anxiety disorders
- Manic syndromes
- Psychotic disorders
- Obsessive compulsive disorders
- Substance abuse
- Dementia
- Schizophrenia (in those with genetic vulnerability)

A Concussion IS a Brain Injury

- Even though most concussions are mild, all are potentially serious and may result in complications including prolonged brain damage and death if not recognized and managed properly. In other words, even a “ding” or a bump on the head can be serious.
- When called to a situation in which someone has been the victim of assault, take the symptoms of concussion into account
- Observe if the following are present:
 - Appears dazed
 - Vacant facial expression
 - Moves clumsily or displays incoordination
 - Answers questions slowly
 - Slurred speech
 - Behavior or personality changes
 - Repeating the same question/comment
 - Seizures or convulsions
 - Nausea or vomiting
 - Loss of consciousness
 - Ability to recall events prior to or after hit
- Ask about the presence of
 - Headaches
 - “Pressure in head”
 - Balance problems or dizziness
 - Blurred, double, or fuzzy vision
 - Sensitivity to light or noise
 - Feeling foggy or groggy
 - Nervousness or anxiety
 - Irritability
 - Confusion
 - Concentration or memory problems

Behavior has a Neuro-Anatomic Basis

- Damage to the frontal and temporal lobes is common with traumatic brain injury
- Damage to the frontal lobe may cause disinhibition, impulsivity, problems stopping an ongoing pattern of behavior, perseveration, loss or lack of motivation, and emotional dyscontrol
- Temporal lobe injury may result in lower frustration tolerance and altered mood states, usually depression.

Behavioral Characteristics of Persons with Brain Injury

- Lack of insight and ability to self-monitor their behavior
- Difficulty appreciating the effects of their behavior on others or making judgments as to the appropriateness of their behavior
- Trouble modulating their behavior or responses to situations
- Irritating or explosive social behaviors
- Problems changing their behavior patterns in response to consequences that may be effective in managing the behavior of others.

Things Can Be Mislabeled as Inappropriate Behavior

- Confusion about expectations
- Inaccurate interpretation of instruction
- Language and non-verbal communication deficits
- Poor insight into deficits
- Memory problems
- Diminished cognitive flexibility

Thinking Difficulties Can Lead to Behavioral Issues

- Cannot initiate activity, or stop once they've started
- Is impulsive, and cannot inhibit their behavior
- Is egocentric and unable to see another's perspective
- Can't do what you want or need them to do, so they engage in other behavior
- Cannot understand what is expected of them / cannot remember long enough to carry out what is expected
- Cannot attend to what's important in their environment.

Communication Difficulties

- Problems recognizing and repairing breakdowns in communication
- Appearing argumentative, stubborn or belligerent
- Inability to interpret body language and social cues
- Poor listening
- Passive, monotone, and slurred speech
- Trouble finding right word
- Difficulty judging personal space
- Getting stuck on an aspect of conversation
- Difficulty seeing things from a different point of view
- Inability to recognize dangerous situations, distinguish between minor & serious problems

Common Communication Pitfalls

- Communication in an environment that is too distracting
- Speaking for/finishing the person's sentences
- Personalization of inappropriate or aggressive language
- Demonstration or verbalization of frustration when the person wanders off, forgets something, or fails to comply with an instruction
- Lack of non-verbal cues to improve comprehension
- Too little or too much verbal information
- Inability to decipher underlying communication when unusual or aggressive behavior is exhibited.

Intervention Approaches

- Talk in direct, short phrases, and allow for delayed responses
- Provide clear and direct feedback regarding behavior
- Repeat questions or instructions in exactly the same way to allow for slowed processing; if problems complying with directions appear to be related to comprehension, phrase it another way
- Don't interpret limited or lack of eye contact as deceit or disrespect; look for, wait for, or ask for response and/or eye contact
- Respond to undesirable behaviors with a clear and specific statement of the behaviors you do and do not want
- Evaluate the person for injury; s/he may have high pain thresholds and be unaware that an injury has occurred
- Seek advice from prosecutor's office for evaluation from community mental health personnel
- If the person is taken into custody for booking and arraignment, and an officer believes or is unsure if the person has a brain injury, err on the side of caution and segregate him/her from the general population; they are at high risk for abuse and further injury

De-escalation strategies

- The behavior of the messenger can affect the behavior of others; rapid movement and increased voice tone convey an escalation of emotion.
- Model calm body language, move and breathe slowly, keep hands down, and use low vocal pitch and congruent facial expression.
- Utilize people who know the person well, who have worked with them before, and know what their behavior may result from and how to handle it
- "Mirroring"; done without agreement or disagreement, without frustration or emotional reaction, with no insinuation of judgment, and with no attempt at logic or correction
 - I guess you're really are mad about this...
 - So, you really think I do not understand...
 - Sounds like you think this is a problem...

Screening

- ***Is not difficult, can be accomplished in less than 3 minutes and could save someone's life***
 - Was your head hit or slammed into an object?
 - Were you choked, suffocated, shaken or strangled?
 - Did you lose consciousness?
 - Did you feel dazed and/or confused?
 - Are you having trouble concentrating, organizing, or remembering things?
 - Are you experiencing headaches, vision and/or hearing problems or loss of balance?

Some Helpful Hints...

- If there's something that needs to be remembered, write it down, and write it down in such a way as to make sense later.
- If there's a plan that needs to be enacted, spell each step out and write it down
- Speak slowly; allow for increased processing time
- Limit the amount of information given at one time
- State expectations clearly
- Ensure understanding
- Remember that the very nature of brain injury can lend itself to disordered thinking
- Believe that at any given time, a person is doing the best they are capable of given their unique skills, personality, environment, and circumstances

Brain Injury Resources

- The Department of Rehabilitative Services (DRS) is the lead state agency for persons with brain injury in Virginia
- State defined core brain injury services: Case Management, Clubhouses/Day Programs, Resource Coordination
- Non-profits and private companies with expertise in brain injury in your service area and across the state

Contact Information

- **Department of Rehabilitative Services (lead state agency for persons with brain injury in Virginia)**
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