What Does TBI Have to do with My Recovery?

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How much do you know?  
True or False

1.) After a brain injury, drinking alcohol or using other drugs can cause a seizure.
2.) Those who use alcohol or other drugs after a brain injury do not recover as well.
3.) Individuals, with abuse patterns before the injury, may require extra emphasis on relapse prevention.
4.) After Brain injury, many people have trouble regulating their emotional responses.
5.) Brain injuries cause problems with thinking, like concentration or memory, and using alcohol and other drugs magnifies these very problems.
6.) Those who drink alcohol or use other drugs, after a brain injury, are more likely to have another brain injury.
7.) Medical complications and additional brain damage can result from prescription drug abuse.
8.) After brain injury, many people have trouble with using the higher functions of their brain.
Today’s Objectives

- Introduce traumatic brain injury
- Gain an understanding of the effects of alcohol on your brain
- Understand the impact a brain injury can have on one’s ability to stay sober
- Review solutions (if we have time)
Traumatic Brain Injury (TBI)

“...an insult to the brain caused by an external force that results in an altered state of consciousness and one or more impairments of brain functioning. Effects may be temporary or permanent.”

(samhsa 2007)
Common Causes of TBI include:

- Falls from a height or on the same level
- Motor vehicle crashes, which may include collision of the head or whiplash
- An object hitting the head, such as a bullet, flying debris, or a falling object
- The head colliding with an object or with another person (e.g., in a contact sport)
- Assaults causing either blunt or penetrating trauma
- Explosions in which an intense wave of pressure passes through the skull

U.S. Department of Health and Human Services, 2010
Causal TBI tidbits

- Sports/recreation have increased 60% during the last decade
  CDC est. 135,000 children ages 5-18 are seen in ER’s for sports related

- TBI associated with violence are highly correlated to lower socio-economic status and with alcohol use
Military TBI

- Blast injuries - leading cause of TBI in the active military at war
- More complex than other types of TBI
- Four separate mechanisms of blast injuries
  - Shock wave (instantaneous rise in atmospheric pressure), Blast wave (being pulled back in the ocean), Shrapnel impact, Blunt trauma impact
- Some studies report 10-20% of all deployed personnel acquire a TBI; one study reported as high as 23% (Terrio, H et al. 2009)
- Among combat veterans deployed in Afghanistan and Iraq 48% have a co-occurrence of mTBI and PTSD. (DSM-5)
TBI as a Predictor for increased rates of problems:

Psychological
- Depression, anxiety, acute stress, PTSD, adjustment disorder, bi-polar, Schizophrenia

Health
- Substance abuse consequences, Sleep disorders/fatigue, Re-injury, Seizures, Dementia....

Functional
- Relationships issues, job problems, financial worries
Traumatic Brain Injury - Types

- OPEN
  - Penetrating skull
  - Damage usually confined to area of penetration

- CLOSED
  - Majority of TBI
  - Non-penetrating impact
  - Dispersal of damage

- Mild TBI (mTBI) 77%
  - Uncomplicated
    - No LOC, Altered scans
  - Complicated
    - LOC 30m, amnesia 24h, coma 13-15

- Moderate 17%
  - LOC 24hr, amnesia 1week, coma 9-12

- Severe 1%
  - LOC 24hr+, amnesia 1wk+, coma 3-8

- Multiple Milds

Meyer 2016 Trauma, Complex Trauma and Co-morbid Conditions
Prevalence of TBI

- 52,000 Deaths
- 275,000 Hospital Admits
- 1,400,000 ER Visits
- ????????? Other Care/No Care

Samhsa 2006 /CDC
Traumatic Brain Injury: Neurobehavioral Impairments

Effects of TBI on the Brain

Impact of Continued Drugs/Alcohol use Brain Recovery

Consequences of Brain Injury on Substance use Recovery
Effects of TBI depend on:

- Number of injuries
- Time between injuries
- Time since last injury
- Severity of injuries
- Areas of injury
- Age the injury(s) occurs
- Status of the person before injury
- What happens after the injury to re-establish previous abilities (treatment)
Effects of Injury

The effects of the injury will not be uniform or necessarily stable.

- Impaired skills in one area does not necessarily mean impaired skills in another area.
- Strengths and weaknesses may change over time, especially with more recent injuries.
- Effects can be physical, cognitive, emotional or behavioral
- The effects of a TBI may be different for each individual and may last weeks, months or years

Minnick 2012, Abilities Taskforce Conference
Again, what does TBI have to do with recovery?

- Alcohol, other drugs and brain injury often go together – both before and after an injury.

- Whether or not a brain injury was caused by using alcohol or other drugs, after an injury the brain reacts differently to these drugs.

- After brain injury, using alcohol and other drugs may have serious risks.
Effects of D/A post injury

- Less brain recovery
- Problems with balance, walking, talking are worsened
- Reduced inhibitions
- Slowed cognition
- More power effect with less
- Increased likelihood of depression
- Increased seizure risk
- Increased risk of additional TBI
Co-occurrence of TBI with Alcohol and Illicit Drugs

- 20% of those hospitalized for TBI are intoxicated at the time of injury (Actual percentage probably significantly higher)
- 10% of those hospitalized have a prior AOD treatment history
- Approximately 50% requiring rehabilitation (PT, ST, OT) have prior history of substance use disorder
- As many as 33% develop substance abuse problems after TBI
- Existing SUD worsens in years 2-5 post TBI w/o Intervention
- Continued substance use after TBI greatly increases the likelihood of additional TBI events
Overlay of 100 consecutive CT scans of patients with closed head injuries (from Bigler, 1984)
Common Frontal Lobe Emotional/Behavioral/Cognitive Problems

- Tendency for Aggression/Irritable
- Failure to initiate
- Lethargy
- Motivation
- Inhibition
- Planning/organizing
- Low tolerance for frustration

- Exaggerated emotional responses/ mood swings
- Judgment/decision making
- Reasoning/problem solving
- Inflexible/rigid thought
- Lack of abstract thinking
- Restlessness
- Dependence
- Lack of self awareness
Executive Functions of the Brain

- The frontal lobe has significant involvement in executive functioning and emotional self-regulation.
- Executive functions include: judgment, problem solving, focusing and maintaining attention on relevant stimuli, planning, regulating, and executing a response.
Questions?

Thanks for Attending
Neurocognitive Functions

- Attention
- Memory
- Processing
- Executive Function
- Initiation
- Impulsivity
- Planning & Organization
- Mental Flexibility
- Self-Awareness
Neurocognitive Functions

Attention
Attention

One of the most important cognitive abilities is being able to pay attention or concentrate on important things happening around us. Attention is often affected when frontal regions of the brain are not working properly. Attention is a basic thinking ability that may set a limit on how well other “down stream” functions work.

What to Look for

Being “checked out”, Appears disinterested or bored, seeks sensory stimulation (playing on their phone), thrill seeking

Accommodations

Break it down - Keep instructions brief, simple, and to the point. Boil down discussions to critical points presented one at a time and organized for the person

Hands on Activities - engagement through practice and rehearsal. Movement and tactile activities to focus
Neurocognitive Functions

Processing
Processing
The time it takes to think through and understand new information or concepts can be affected when a person has neurocognitive deficits. This does not mean they cannot understand – they may just need more time to understand.

What to Look for
Picks up only portions of conversations, difficulty keeping up with conversation, tires easily, described as lazy, may seem passive or unmotivated

Accommodations
Frequent summarization of simple instructions, check in regularly for comprehension, slow down – allow time for client to process and respond
Neurocognitive Functions

Memory
Memory

Persons with neurocognitive deficits can have trouble recalling or remembering information. They often have problems holding several thoughts at once or organizing several pieces of information in their mind to make a decision or take action.

What to Look for

Described as forgetful, appears inattentive, problems recalling newly learned information, problems with follow through of task completion.

Accommodations

Develop an organizational system and write everything down, review and repeat instructions frequently, teach the “Remember to Remember”. Teach compensatory strategies (developing cues or triggers) such as checking a calendar at the end of a session. Teach associations that will help trigger recall (e.g. brushing teeth is a cue to take medication), Practice and reinforce compensatory strategies until they become automatic
Neurocognitive Functions

- Executive Function
- Initiation
- Impulsivity
- Planning & Organization
- Mental Flexibility
- Self-Awareness
Problem = Initiation

Responsibilities at home or work require the completion of a sequence of tasks. Often individuals with neurocognitive challenges can have difficulty getting started or initiating action. Sometimes a person can tell you what he or she wants to do but cannot initiate the steps needed to perform that activity.
What to Look For

- Has trouble getting started with a task
- Appears passive or unmotivated
- Needs constant reminders or prompting to complete a task
- Able to identify a goal but cannot act to achieve it
- Often referred to as “lazy”
Accommodating Problems with Initiation

**Simplify**
- Break large projects down into small, more achievable steps (e.g. completing a job application or selecting a place to live)
- Encourage the person to focus on one step at a time

**Check it off**
- The use of checklists and calendars can help organize and prompt self-care activities and daily duties.
- Learning to refer to the checklist when “stuck” can help the person move on to the next step.
- Over time the checklist may be internalized as a familiar routine

**Set an Alarm**
- A timer can be used to help the person get started and learn to focus on being productive for a set period of time
- An alarm can be used to alert the person to start an activity
- Timers or alarms can be as simple as a kitchen or stove timer to something more complex and portable like an appointment feature on a smart phone
Problem = Impulsivity

Sometimes it is difficult to start an activity, and other times it is hard to stop one. Problems with impulsivity are very common in persons who have neurocognitive problems associated with frontal lobe functioning.
What to Look For

- May do or say things without thinking
- May have trouble knowing when to stop an activity
- Appears to do things quickly without regard for safety
- May not follow directions
- May dominate conversation or interrupt
Accommodating Problems with Impulsivity

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<tr>
<th>Stop, Think, Act</th>
<th>Immediate Gratification</th>
<th>Give Feedback</th>
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| • Teaching “Stop, Think, Act” encourages a person to slow down and think about the consequences of a behavior or activity before deciding to act (e.g. Is this a good idea or a bad idea? What might happen? Is this consistent with my goals?) | • Providing incentives for shorter-term goals (e.g. gift cards for attending appointments) can improve compliance in the short term when the person is unable to keep a longer-term goal in mind | • Respond directly to inappropriate behavior. For example, say, “What you just said was not OK.”  
• Be clear when setting expectations, limits and consequences |
These days, busy schedules require us to keep track of a lot of information. Many people with neurocognitive problems have difficulty planning and organizing daily activities, or need assistance with a method of planning and organizing such tasks.
What to Look For

- Is often late for appointments
- Has difficulty remembering things that need to be done in the future
- Often misses important deadlines
- Gives up easily on tasks
- Appears to jump from activity to activity without completing anything
Accommodating Problems with Planning & Organization

Be Predictable

- Encourage the person to develop and maintain consistent routines throughout the day
- Identify a place to keep important items like keys, wallet/purse, glasses and calendar

Planner

- Encourage the use of a system for organizing activities, appointments, and “to do” lists that matches the needs and abilities of the person. The system can be a simple calendar or a smart phone or electronic tablet with advanced features
- Apps for smart phones and tablets have been developed to help meet the needs of people with cognitive problems
- Prompt to write down important or key points of information

Set the Agenda

- Remind the person of the purpose of a session as well as what to expect along the way with a description of the final outcome and goal
- Provide directions or instructions several times, and ask the person to repeat the instructions back to you. You can ask, “Now you tell me the instructions in your own words”
Everyday life requires us to switch gears and think on our feet. A new approach may be needed when circumstances change. When someone has difficulty with mental flexibility, he or she has trouble adjusting to changing situations and unfamiliar circumstances.
What to Look For

- Has difficulty thinking on his or her feet
- Gets stuck on an idea or one way of thinking
- Has difficulty adjusting to new or unexpected tasks and activities
- May be argumentative and not be able to see the perspective of another person or consider a different idea
Accommodating Problems with Mental Flexibility

Rehearse

• Don’t take for granted that something learned in one environment will generalize to another. It is important to practice strategies in multiple environments with different staff or support persons.

Plan B

• Persons with cognitive problems often cannot come up with solutions or alternatives to situations that don’t happen as planned. Try to plan for obstacles and come up with a “Plan B”. For example, identify a lead or mentor in the environment who can serve as a resource to use if problems occur in the program or on the job. Practice going to that person and asking for assistance.

Moving On

• It’s easy for persons with cognitive problems to get stuck on a topic or idea. When reviewing material, announce that you are moving on to a new subject and allow extra time for that transition. Providing handouts and an agenda may also be helpful.
We take for granted that people know how they are being perceived or how they are coming across. Individuals with neurocognitive impairment often have problems with their behavior and may not be aware of how they are being perceived by others.
What to Look For

- Underestimates problems or may not be aware that a problem exists
- Often sets unrealistic goals
- Is unable to identify or alter inappropriate behaviors
- May say things other people might be thinking but would not say aloud
- May use language that is not appropriate for the situation or audience
- May dominate interactions with others
Accommodating Problems with Self-Awareness

Plan
- Plan ahead for situations that may bring about poor judgment and talk about potential obstacles

Practice
- Practice positive social interactions ahead of time
- Cue for compensatory strategies

Promote
- Promote positive behavior by stopping and addressing undesired behavior immediately.
- Provide alternative comments or choices that could have made
Self Regulation

Emotional control
  - Manage responses to situations

Reward processing
  - Instant gratification / long-term goals

Self-awareness

Managing the emotional center of the Brain – The amygdala

(Stuss and Levine, 2002)
Self-regulation can be represented in other populations

- Substance use disorders, Attention deficit disorder, Various mood disorders and PTSD
- All are more prone to having a TBI or additional TBI…
- Substantial co-morbidity exists / the effects of multiple disorders on self regulation is not well understood.
Summary

- The frontal lobe of the brain is most commonly injured.
- Deficits in executive functioning and self-regulation are frequently observed after TBI.
- Self-regulation is at the core of who we are, how we respond to different situations, and how well we are able to move toward the completion of our long-term goals.
- Many individuals with TBI have additional disorders associated with impaired self-regulation. The effects of such co-occurring disorders are not yet well understood.
Traumatic Brain Injury:

Neurological damage Vs Psychological damage

TBI and PTSD
Brain Tissue – physiological

- The insult of a TBI on the brain
  - Brain floats inside the skull
  - Force impacts the skull
  - Coup – countrecoup
  - Inside of skull – full of boney nodes/ridges
  - Shredding
Long-standing view – physiological impact of TBI

- Impairments observed in the after mTBI
  - Attributed to neurologic damage
  - Largely minimized psychological distress

- Typical impairments post mTBI are generally referred to as Post-Concussive Symptoms
  - Memory, balance, focus, concentration, irritability, sensitivity to light and sound, emotional lability, easily over-whelmed, frustration, headaches

Bryant, 2008 NEJM
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TBI: Why Screen for it?

TBI is usually not a visible disorder
Some people may not know they have had a TBI
Documentation of history of TBI may not be found in medical records
Effects of TBI have a significant impact on responsiveness to standard services or treatment methods
How to screen and resources

- www.brainline.org  
  Brainline.org

- www.MSKTC.org/TBI  
  Model Systems Knowledge Transition Center

- www.ohiovalley.org  
  Ohio Valley Center

- Screening form