

Identifying and Accommodating TBI in Behavioral Health Treatment



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Financial Disclosure

I have no financial relationships to disclose relevant to this presentation.

Will address 3 questions:

1. What is a TBI?
2. How can you determine if a person has had a TBI?
3. How can you accommodate the effects of TBI in treatment?

1. What is a TBI?

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.”

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Traumatic Brain Injury (TBI)

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Poll Question*

TBI is...

- A. A life altering injury for survivors and their families, profoundly impacting the patient's functional status.
- B. A very common injury that is essentially inconsequential to the individual's functional status following recovery.
- C. This is some sort of trick question.
- D. All of the above.

*Thanks D. Arciniegas & H. Wortzel for this slide

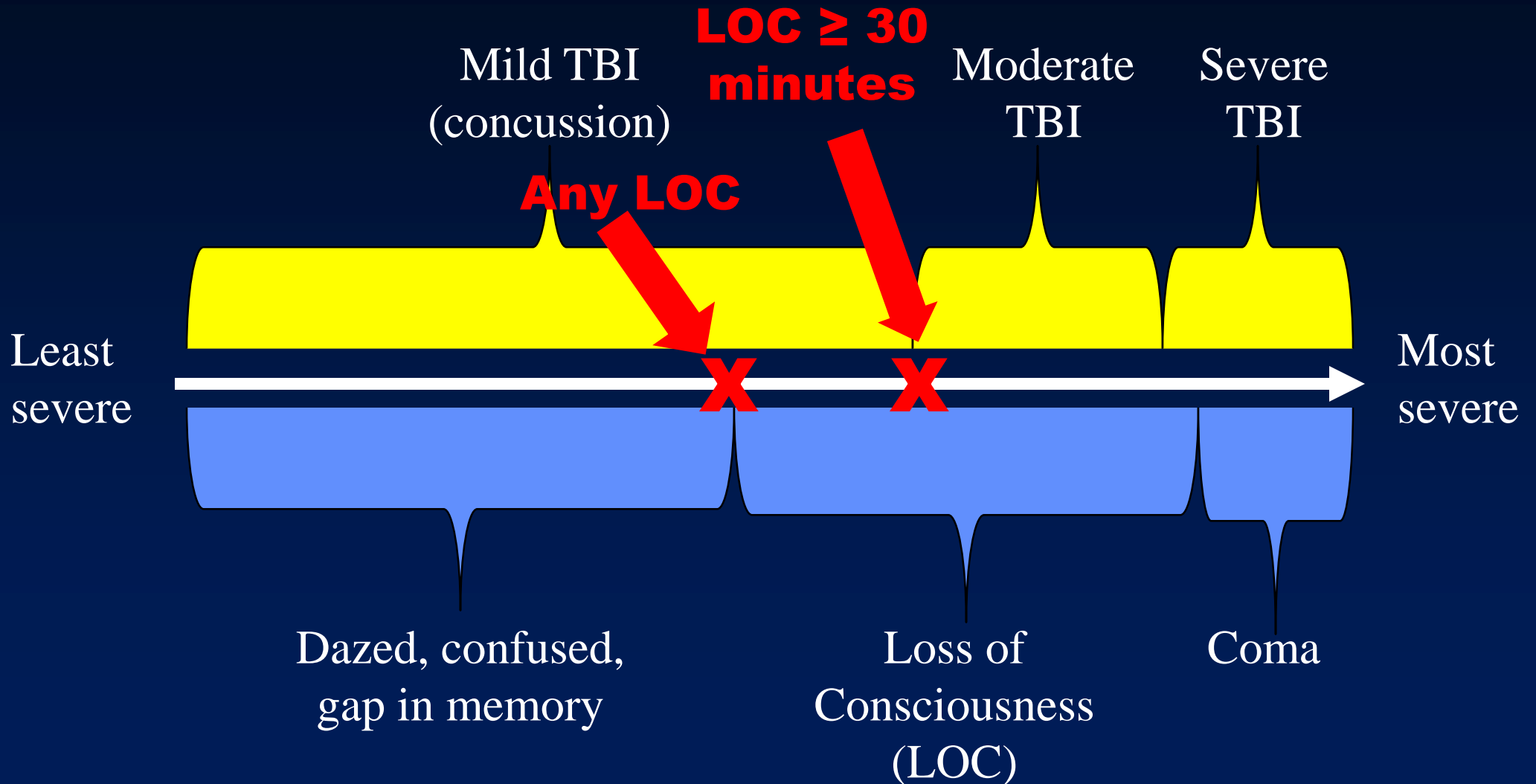
TBIs Vary in Severity

	Mild	Moderate	Severe
Glasgow Coma Scale Score	13-15	9-12	3-8
Length of Loss of Consciousness	less than 30 minutes	30 minutes to 24 hours	more than 24 hours
Length of Post-traumatic Amnesia	up to 1 day	1 day to 1 week	more than 1 week

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Continuum of TBI Severity



When Is a Mild TBI More than Mild?

- When it's recent
- When it adds on to another source of compromised brain functioning
- When it occurs in childhood
- When there are multiple mild TBIs

TBI due to Blasts—the “signature injury” of combat in Iraq and Afghanistan



- Can blast forces alone cause mild TBI?
- If so, is it the same pathology as TBI caused by mechanical forces?
- What about multiple blasts?

TIME

Michigan Football Apologizes For Letting QB With A Concussion Play



N.F.L. Agrees to Settle Concussion Suit for \$765 Million

NCAA has settlement agreement



College football player who committed suicide had brain injury

The New York Times

CNN.com

NFL player who killed girlfriend in murder-suicide had brain damage

By RYAN JASLOW / CBS NEWS / August 21, 2013, 6:59 PM

USA TODAY

CTE study finds first symptoms in athletes with brain disease



Unanswered questions about the cumulative effects of “impacts” to the head

- Number, spacing or strength?
- Type of injury (high velocity, blast)?
- Present even without symptoms (the sub-concussive injury)?
- Uses up reserves, triggers a pathological process or both?
- Are some people at more risk than others (genetic, epigenetic)?

Groups Who May Have Multiple Mild TBI's

- Military personnel, particularly those with combat deployment in OEF/OIF
- Athletes, particularly boxers, football players & hockey players
- Victims of intimate partner violence and childhood physical abuse
- People who misuse and abuse substances
- People who are homeless

The Fingerprint of TBI is Damage to the Frontal Areas of the Brain

- Regardless where the impact is on the head, the frontal lobes are most likely injured
- Frontal lobe damage can change how rewards and consequences are processed—increasing risk of behavioral health problems
- Frontal lobes are critical to behavioral control and, in turn, success in behavioral health treatment
- Early developmental injuries also have behavioral health consequences, even when mild

All behavioral health professionals should know whether the person they are working with has had a TBI.

2. How can you determine if a person has had a TBI?

Issues Detecting a Lifetime History of TBI

- Capture from medical encounters
 - medical treatment often may not be sought
 - lifetime records not available
 - mild TBI often missed in Emergency Departments
- Biomarkers
 - imaging, neuropsych assessment specific but not sensitive
 - proteomics very acute only and sensitive but not specific
- Retrospective self-report
 - cannot self-diagnose
 - not aware of injury (“telescoping,” poor memory, too young)

**Gold
Standard**

Challenges Eliciting Self-reports

- Public's limited or inaccurate knowledge
- Need to stimulate recall
- Injuries before age 5
- Concurrent sources of altered consciousness
- Periods of multiple blows to the head

Selected Methods of Eliciting Self-report

- TBI-TAC identified 20 different tools being used
- DVBIC Brief TBI Screen (BTBIS; Schwab et al.)
- TBI Questionnaire (TBIQ; Diamond et al.)
- Brain Injury Screening Questionnaire (BISQ; Gordon et al.)
- OSU TBI Identification Method (OSU TBI-ID; Corrigan & Bogner)
- Boston Assessment of Traumatic Brain Injury Lifetime (BAT-L; Fortier et al.)

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Initial Reliability and Validity of the Ohio State University TBI Identification Method

John D. Corrigan, PhD; Jennifer Bogner, PhD

Objectives: Evaluate the psychometric reliability and validity of the Ohio State University TBI Identification Method. **Participants:** Convenience samples of 119 (study 1) and 103 (study 2). **Measures:** Summary indices of the Ohio State University TBI Identification Method elicited via a structured interview. **Results:** The method was characterized by severity weighted symptoms persisting, worst injury, time to loss of consciousness. Age at injury and severity of injury were significant predictors of cognitive and behavioral consequences. **Conclusions:** The reliability and validity of summary indices of the Ohio State University TBI Identification Method in screening, substance use disorders, trauma

Reliability and Predictive Validity of the Ohio State University TBI Identification Method With Prisoners

Jennifer Bogner, PhD; John D. Corrigan, PhD

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The Reliability of a Computer-Assisted Telephone Interview Version of the Ohio State University Traumatic Brain Injury Identification Method

Jeffrey P. Cuthbert, PhD, MPH, MSOT; Gale G. Whiteneck, PhD; John D. Corrigan, PhD; Jennifer Bogner, PhD

J Head Trauma Rehabil
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traumatic brain injury (TBI) and female ($N = 105$) state prisoners. **Measures:** Summary indices of the Ohio State University TBI Identification Method elicited via a computer-assisted telephone interview. Factor analysis showed that (1) time to loss of consciousness, (2) combinations of symptoms, (3) severity of injury, (4) effects. Age at injury, number of injuries, and severity of injury were significant predictors of common consequences. **Conclusions:** The computer-assisted telephone interview version of the Ohio State University TBI Identification Method provides support for the reliability and validity of the structured interview. **Keywords:** computer-assisted telephone interview, reliability, validity, traumatic brain injury, prisoners

Altered amygdala connectivity in individuals with chronic traumatic brain injury and comorbid depressive symptoms

Neurological correlates of lifetime history of TBI from the OSU TBI-ID

Kihwan Han^{1*}, Sandra B. Chapr

Orbitofrontal cortical thinning and aggression in mild traumatic brain injury patients

Plasma Anti-Glial Fibrillary Acidic Protein Autoantibody Levels during the Acute and Chronic Phases of Traumatic Brain Injury: A Transforming Research and Clinical Knowledge in Traumatic Brain Injury Pilot Study

liot Bueler^{2,3} | Jace King^{1,2} |

Kevin K. W. Wang,^{1,*} Zihui Yang,^{1,*} John K. Yue,¹ Ava M. Puccio,⁴ Ramon Diaz-Arrastia,⁵ Hester F. Ling,⁶ Alex B. Valadka,⁶ Wayne A. Gordon,⁹ David O. Okonkw,⁷ Investigators (including Shelly R. Cooper,^{2,3,6} Kristen Dar,⁸ Andrew I. R. Maas,¹⁰ David K. Menon,¹¹ David M. Schn

Disrupted Intrinsic Connectivity among Default Mode, Dorsal Attention, and Frontoparietal Control Networks in Individuals with Chronic Traumatic Brain Injury*

Mean cortical curvature reflects cytoarchitecture restructuring in mild traumatic brain injury

OSU TBI Identification Method

- Structured interview designed to elicit lifetime history of TBI.
- Avoids misunderstanding about what a TBI is by eliciting injuries, then determining if altered consciousness occurred.
- Provides more information than simple “yes/no”

Free training at: www.ohiovalley.org

Traumatic Brain Injury Identification Method

A Tool for Health Care and Social Service Professionals



Wexner Medical Center

Ohio Valley Center for Brain Injury Prevention and Rehabilitation
Department of Physical Medicine and Rehabilitation
The Ohio State University



Presentation produced in partnership with BrainLine, a project of WETA

Ohio State University TBI Identification Method — Interview Form

Step 1

Ask questions 1-5 below. Record the cause of each reported injury and any details provided spontaneously in the Chart at the bottom of this page. You do not need to ask further about loss of consciousness or other injury details during this step.

I am going to ask you about injuries to your head or neck that you may have had anytime in your life.

1. In your lifetime, have you ever been hospitalized or treated in an emergency room following an injury to your head or neck? Think about any childhood injuries you remember or were told about.

No Yes—Record cause in chart

2. In your lifetime, have you ever injured your head or neck in a car accident or from crashing some other moving vehicle like a bicycle, motorcycle or ATV?

No Yes—Record cause in chart

3. In your lifetime, have you ever injured your head or neck in a fall or from being hit by something (for example, falling from a bike or horse, rollerblading, falling on ice, being hit by a rock)? Have you ever injured your head or neck playing sports or on the playground?

No Yes—Record cause in chart

4. In your lifetime, have you ever injured your head or neck in a fight, from being hit by someone, or from being shaken violently? Have you ever been shot in the head?

No Yes—Record cause in chart

5. In your lifetime, have you ever been nearby when an explosion or a blast occurred? If you served in the military, think about any combat- or training-related incidents.

No Yes—Record cause in chart

Interviewer Instruction:

If the answers to any of the above questions are "yes," go to Step 2. If the answers to all of the above questions are "no," then proceed to Step 3.

Step 2

Interviewer instruction: If the answer is "yes" to any of the questions in Step 1 ask the following additional questions about each reported injury and add details to the Chart below.

Were you knocked out or did you lose consciousness (LOC)?

If yes, how long?

If no, were you dazed or did you have a gap in your memory from the injury?

How old were you?

Step 3

Interviewer instruction: Ask the following questions to help identify a history that may include multiple mild TBIs and complete the Chart below.

Have you ever had a period of time in which you experienced multiple, repeated impacts to your head (e.g. history of abuse, contact sports, military duty)?

If yes, what was the typical or usual effect—were you knocked out (Loss of Consciousness - LOC)?

If no, were you dazed or did you have a gap in your memory from the injury?

What was the most severe effect from one of the times you had an impact to the head?

How old were you when these repeated injuries began/ Ended?

Step 1 Cause	Step 2 Loss of consciousness (LOC)/knocked out				Dazed/Mem Gap		Age
	No LOC	< 30 min	30 min-24 hrs	> 24 hrs	Yes	No	

If more injuries with LOC: How many? _____ Longest knocked out? _____ How many ≥ 30 mins.? _____ Youngest age? _____

Step 3 Cause of repeated injury	Typical Effect		Most Severe Effect				Age	
	Dazed/ memory gap, no LOC	LOC	Dazed/ memory gap, no LOC	LOC < 30 min	LOC 30 min - 24 hrs.	LOC > 24 hrs.	Began	Ended

Individuals with a history of TBI are more likely to:

- Struggle with current life stressors
- Have difficulty adapting to new situations
- Have problems following through on recommendations from health care providers



The goal of Step 2 is to elicit further details about injuries to the head or neck and to determine if there was a loss of consciousness.

In Step 2, probe and record details including age, loss of consciousness, and memory gaps for each injury. It is important to ask the question and record information separately for each injury in Step 1.



At this point in the interview, your form should look like this:

Name: Sample Patient Current Age: 25 Interviewer Initials: TAF Date: 7/24/13

Ohio State University TBI Identification Method -- Interview Form

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2. In your lifetime, have you ever injured your head or neck in a car accident or from crashing some other moving vehicle like a bicycle, motorcycle or ATV?
 No Yes—Record cause in chart
3. In your lifetime, have you ever injured your head or neck in a fall or from being hit by something (for example, falling from a bike or horse, rollerblading, falling on ice, being hit by a rock)? Have you ever injured your head or neck playing sports or on the playground?
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4. In your lifetime, have you ever injured your head or neck in a fight, from being hit by someone, or from being shaken violently? Have you ever been shot in the head?
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What was the most severe effect from one of the times you had an impact to the head?

How old were you when these repeated injuries began? Ended?

Step 1	Step 2				Dazed/Mem Gap		Age
	Loss of consciousness (LOC)/knocked out				Yes	No	
Cause	No LOC	< 30 min	30 min-24 hrs	> 24 hrs			
car accident	✓	✓			✓	✓	22
high school football					✓		↑

If more injuries with LOC: How many? _____ Longest knocked out? _____ How many ≥ 30 mins.? _____ Youngest age? _____

Step 3	Typical Effect		Most Severe Effect			Age		
	Dazed/ memory gap, no LOC	LOC	Dazed/ memory gap, no LOC	LOC < 30 min	LOC 30 min - 24 hrs.	LOC > 24 hrs.	Began	Ended
Cause of repeated injury								

Adapted with permission from the Ohio State University TBI Identification Method (Corrigan, J.D., Bogner, J.A. (2007). Initial reliability and validity of the OSU TBI Identification Method. J Head Trauma Rehabil, 22(6):318-329. © Reserved 2007, The Ohio Valley Center for Brain Injury Prevention and Rehabilitation

OSU TBI-ID: Step 1

5 Questions:

The goal of these questions is to help recall injuries to the head or neck by reminding the respondent about hospital visits and probing for common causes of TBI.

Do not be concerned about whether a TBI occurred, only if it was possible.

Ohio State University TBI Identification Method — Interview Form

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How old were you?

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If no, were you dazed or did you have a gap in your memory from the injury?

What was the most severe effect from one of the times you had an impact to the head?

How old were you when these repeated injuries began/ Ended?

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If more injuries with LOC: How many? _____ Longest knocked out? _____ How many ≥ 30 mins.? _____ Youngest age? _____

Step 3 Cause of repeated injury	Typical Effect		Most Severe Effect				Age	
	Dazed/ memory gap, no LOC	LOC	Dazed/ memory gap, no LOC	LOC < 30 min	LOC 30 min - 24 hrs.	LOC > 24 hrs.	Began	Ended

OSU TBI-ID: Step 2

Determine if a TBI occurred

Were you knocked out or did you lose consciousness (LOC)?

- If yes, how long?

- If no, were you dazed or did you have a gap in your memory from the injury?

How old were you?

OSU TBI-ID: Step 3

Determine if there were any periods with repeated blows to the head

Have you ever had a period of time in which you experienced multiple, repeated impacts to your head (e.g., history of abuse, contact sports, military duty)?

- If yes, what was the typical or usual effect—were you knocked out (Loss of Consciousness—LOC)?
- If no, were you dazed or did you have a gap in your memory from the injury?

What was the most severe effect?

How old were you?

Key Considerations: Problematic Lifetime Exposure

A person may be more likely to have ongoing problems if they have any of the following:

WORST

One moderate or severe TBI

FIRST

TBI with loss of consciousness before age 15

MULTIPLE

Had 2 or more TBIs close together, including a period of time when they experienced multiple blows to the head

RECENT

A mild TBI in recent weeks or a more severe TBI in recent months

OTHER SOURCES

Any TBI combined with another way that their brain function has been impaired

Next Steps

If the person you've screened has had a sufficient history of TBI, consider the following treatment planning issues:

- [Learn more about TBI](#), and share what you've learned with the impacted individual.
- Consider simple [accommodations](#) you can make in your treatment.
- If cognitive problems are getting in the way of treatment or services, consider consulting a rehabilitation professional.
- Consider how side effects of any medication you are prescribing may interact with existing impairment.

A list of resources to help you is on the next slide.

Problematic History of TBI

May have difficulty:

- accessing services
- remaining engaged in services
- knowing what supports they need
- consistently using supports

due to barriers created by cognitive and/or behavioral weaknesses that result from damage to the frontal lobes of the brain.

3. How can you accommodate the effects of TBI in treatment?

Accommodating the Symptoms of TBI

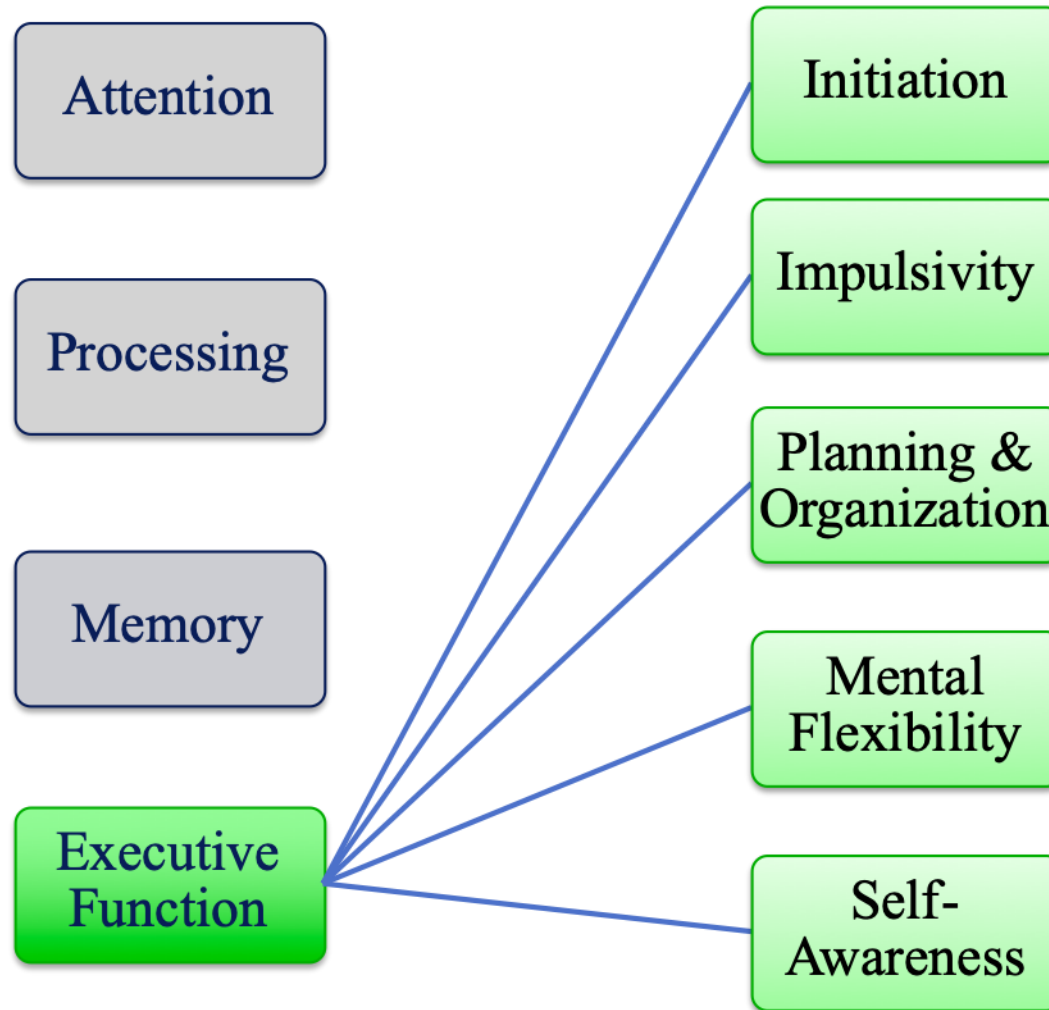
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Prevention and Rehabilitation

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Neurocognitive Functions



Demonstration



Demonstration 2



People with more complicated histories of TBI have more problems complying with clinical & programmatic expectations:

- By taking into account the effects of a TBI, service providers will better understand their clients.
- Increased understanding can help to build therapeutic rapport.
- Adapting services does not need to be expensive, and can improve overall effectiveness.
- Some adaptations may also be applicable to persons with other disabilities.

OSU TBI-ID & Accommodations free training:

Ohio Valley Center for Brain Injury Prevention &
Rehabilitation at Ohio State University
ohiovalley.org

Informative websites:

WETA in Washington DC: brainline.org

TBI Model Systems Knowledge Translation Center:
msktc.org

Brain Injury Association of America: biausa.org

THANK YOU!

ADDENDUM

TBI in DSM-5

- TBI addressed principally within framework of the Neurocognitive Disorder (NCD).
- NCDs are the reframed criteria for all conditions except delirium that were included in the “Delirium, Dementia, Amnestic, and Other Cognitive Disorders” chapter of the DSM-IV-TR.
- The NCDs are conditions in which impaired cognition is present and is not the result of a congenital or early developmental cause.

Mild Neurocognitive Effects

- A. Evidence of modest* cognitive decline in any cognitive domain (complex attention, executive function, learning and memory, language, perceptual-motor, or social cognition) via self- or other-report or standardized testing.
- B. Cognitive deficits do not interfere with independence in everyday activities (but greater effort, compensatory strategies, or accommodation may be required).
- C. Cognitive deficits not due to delirium.
- D. Cognitive deficits not better explained by another mental disorder.

* “Modest” cognitive decline results in functioning @ 1 to 2 STD for normative population (3rd-16th percentile)

Major Neurocognitive Effects

- A. Evidence of significant* cognitive decline in any cognitive domain via self- or other-report or standardized testing.
- B. Cognitive deficits interfere with independence in everyday activities (i.e., at least requiring assistance with complex instrumental activities of daily living).
- C. Cognitive deficits not due to delirium.
- D. Cognitive deficits are not better explained by another mental disorder.

* “Significant” cognitive decline results in functioning ≥ 2 STD below population norms

NCD due to TBI

- A. Meet criteria for Major or Mild NCD
- B. Evidence of TBI with altered consciousness or neurological sign (the definition of TBI)
- C. NCD presents immediately after TBI or upon recovery of consciousness and persists past the acute recovery period.