



CHANGING  
*Maryland*  
*for the Better*

# Screening & Accommodating for a History of TBI, a Critical Component of Building a Person Centered Care Plan

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May 3, 2017



# How many Americans sustain a TBI annually?

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- 231,840
- 1.8 million
- 1.2 million



# Civilian Risk Factors for any TBI

Courtesy of John Corrigan Ph.D  
Ohio Valley Center 2014

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- Males 2:1 more than female
- Very young and very old due to falls
  - Adolescents and young adults due to intentional injuries and moving vehicle crashes
- Greatest behavioral risk factors:
  - violence prone or exposed to those who are
  - misuse substances or exposed to those who do
- More risk among lower socio-economic groups

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# Civilian Groups Who Have Multiple Mild TBIs

Courtesy of John Corrigan Ph.D  
Ohio Valley Center 2014

- 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
- Individuals with mental health issues



# True or False.....

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- 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



# The Scope of the Problem

- **Distribution of Severity:**
  - Mild injuries = 80%  
(Loss of Consciousness < 30 min, Post Traumatic Amnesia <1 hour)
  - Moderate = 10 - 13%  
(LOC 30 min-24 hours, PTA 1-24 hours)
  - Severe = 7 - 10%  
(LOC >24 hours, PTA >24 hours)



# Continuum of TBI Severity

Courtesy of John Corrigan Ph.D

Ohio Valley Center 2014

Mild TBI  
(concussion)

Moderate  
TBI

Severe  
TBI

**Any LOC**

**LOC  $\geq$  30  
minutes**

**LOC > 24 hours**

Least  
severe

Most  
severe

Dazed, confused, gap in  
memory

Loss of  
Consciousness  
(LOC)

Coma



# TBI-Defined

Traumatic Brain Injury is an insult to the brain caused by an external physical force, for example; fall, MVA, assault, sport-related, IED exposure

# ABI-Defined

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

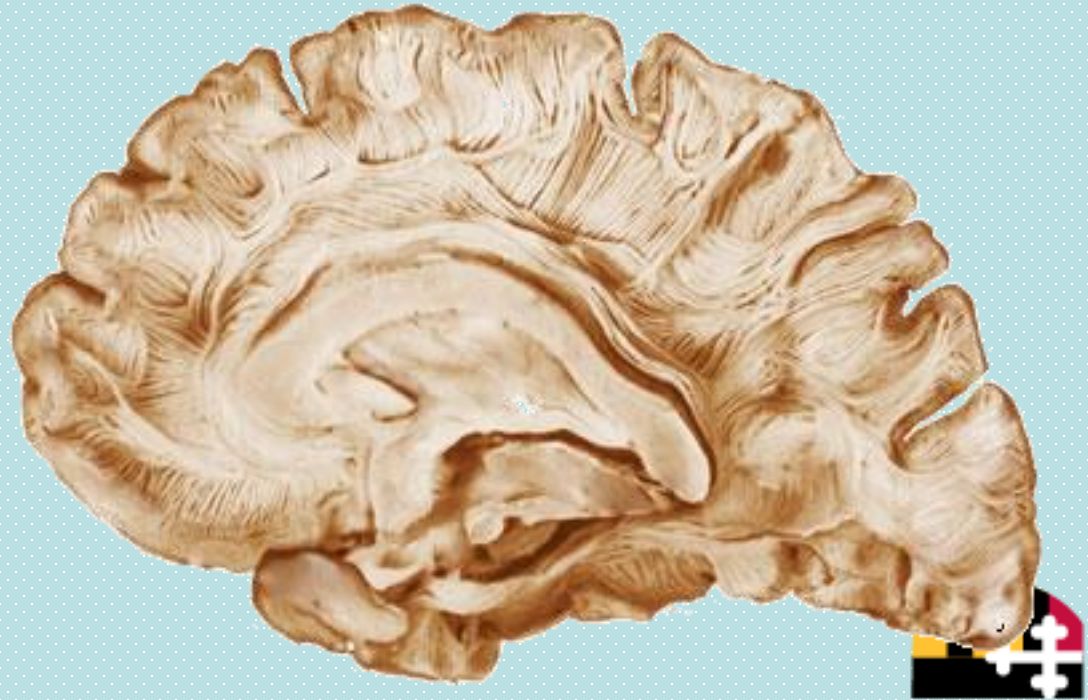
**Both Mechanisms of Injury can result in chronic disability that may get worse with age \***





# Diffuse Axon Injury

is a very serious injury, as it directly impacts the major pathways of the brain. Common with sports, intimate partner violence, IED exposure, shaken baby, MVAs



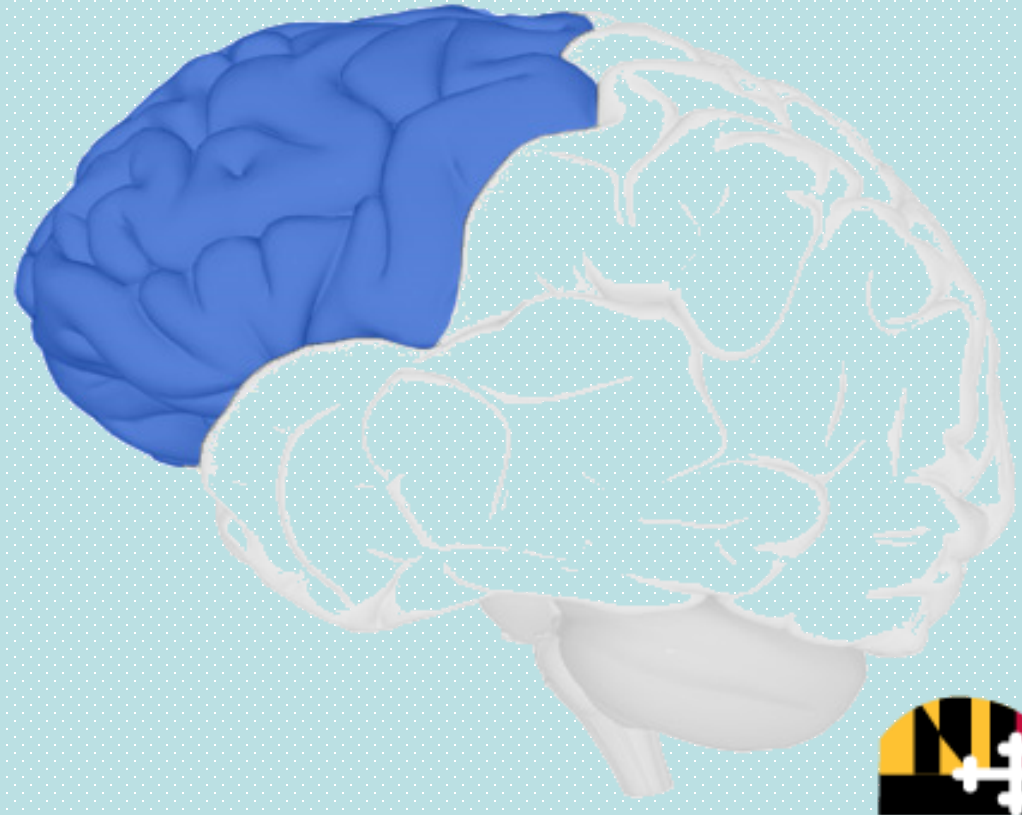
# The Frontal Lobe

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.

Not to diminish injury to the Parietal or Occipital Lobes, but damage to these areas tend not have the strong behavioral health impact seen in Frontal and Temporal Lobe damage



# Temporal Lobe

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.



## The “Fingerprint” of TBI

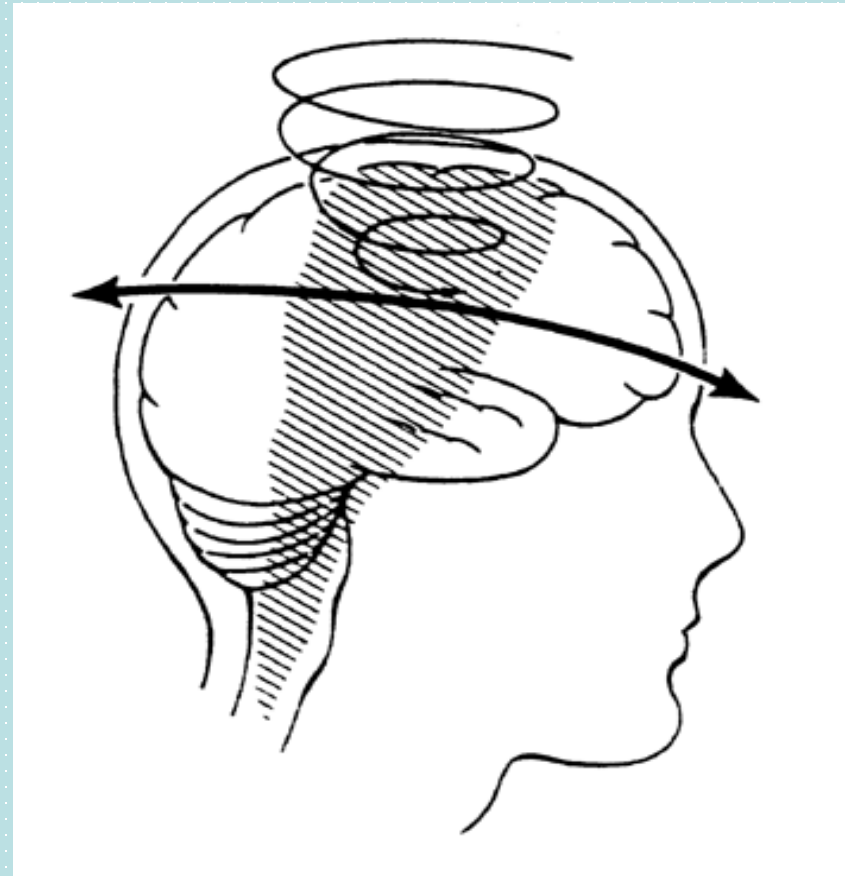
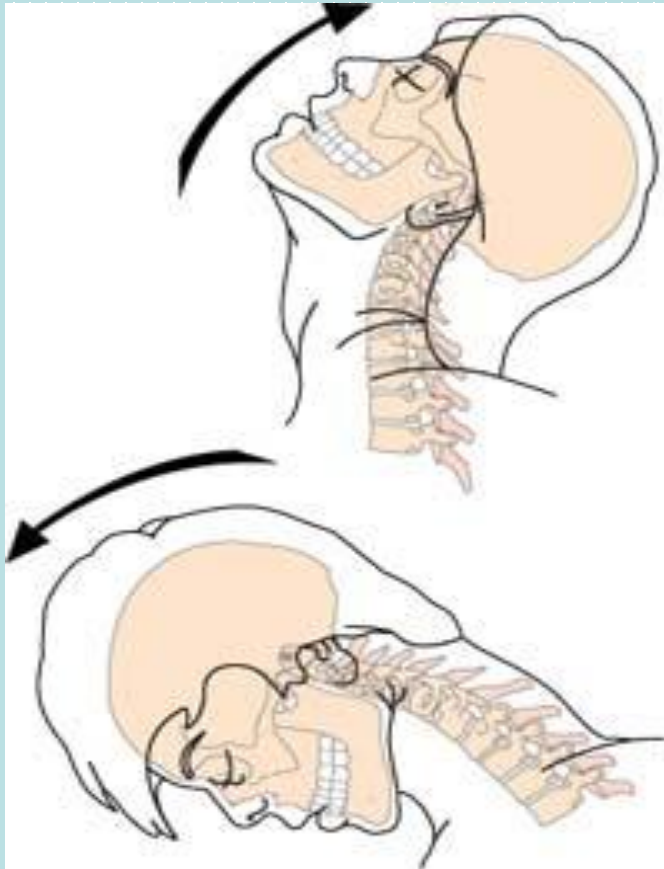
Frontal areas of the brain, including the frontal lobes, are the most likely to be injured as a result of TBI, **regardless** the point of impact to the head



# The brain is set into motion along multiple axial planes

Pathophysiology

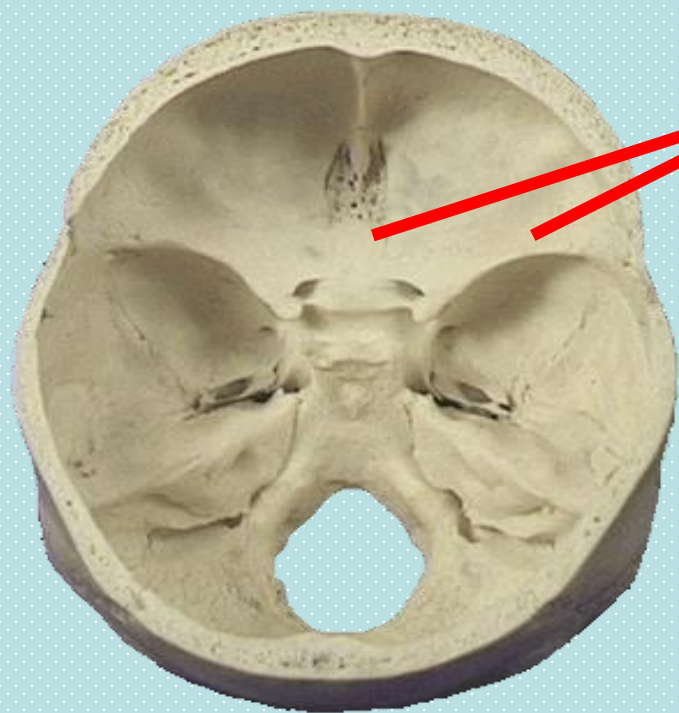
Courtesy of John Corrigan Ph.D.



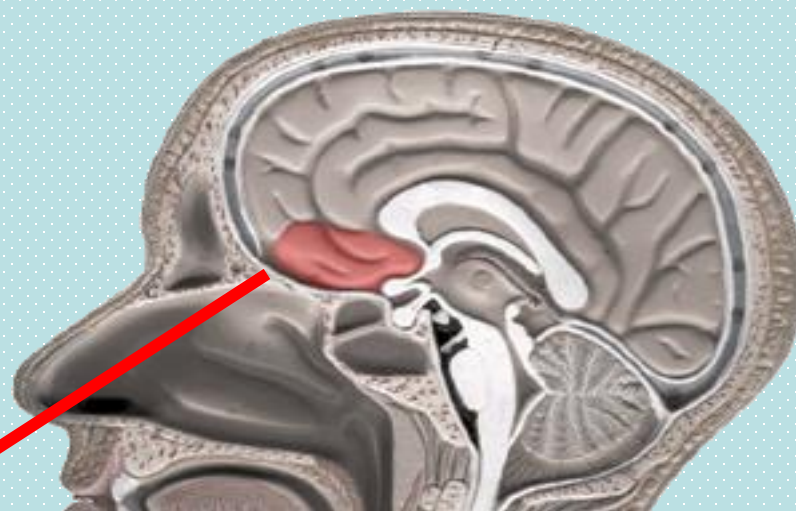


# Interior Skull Surface

Pathophysiology



**Bony ridges**



**Injury from contact  
with skull**



# Possible Physical Changes

Injury related problem	How it may affect a person functionally....
Coordination	Unsteady gait, poor eye-hand coordination, slow or slurred speech, tremors, paralysis
Visual Deficits	Staring or poor eye contact, blurred or double vision, inability to follow an object with their eyes, visual field neglect
Additional Physical Challenges:	Seizures, deaf or hard of hearing, fatigue



# Possible Changes in Thinking, aka Cognitive Skills

Injury related problem	How it may affect a person functionally....
Memory	Trouble following directions, providing requested information, making appointments
Processing (receptive)	Understanding what being said, reading
Processing (expressive)	Trouble putting thoughts into words, tip of the tongue syndrome
Problem solving (related to frontal lobe & temporal tip Injury)	Impulsive, easily frustrated, sexually disinhibited, verbally/physically combative, interpersonally inflexible, poorly organized
Attention	Decreased ability to focus and sustain attention, difficulty splitting and dividing attention, can compromise memory for new information



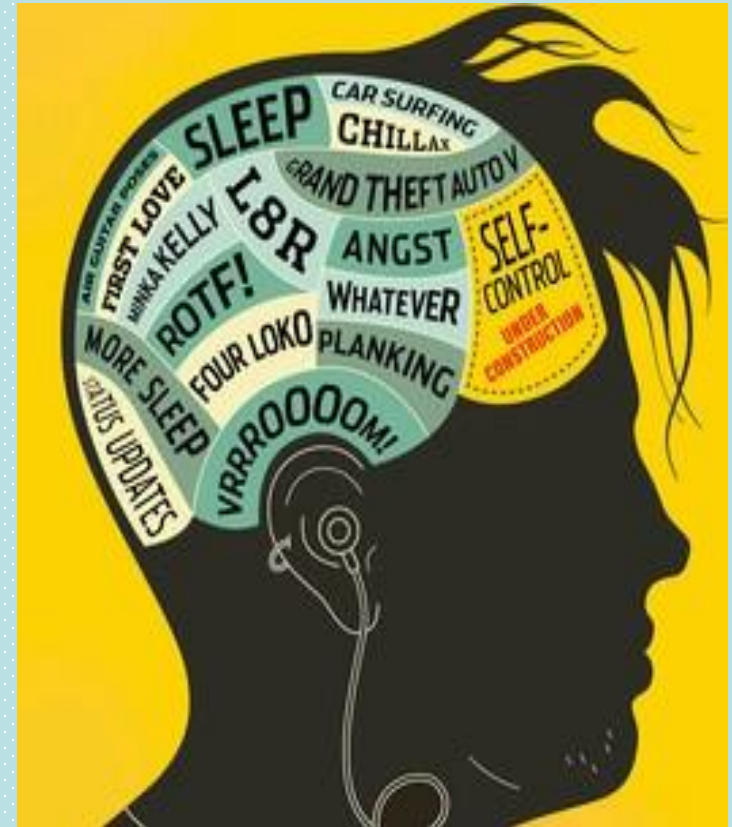
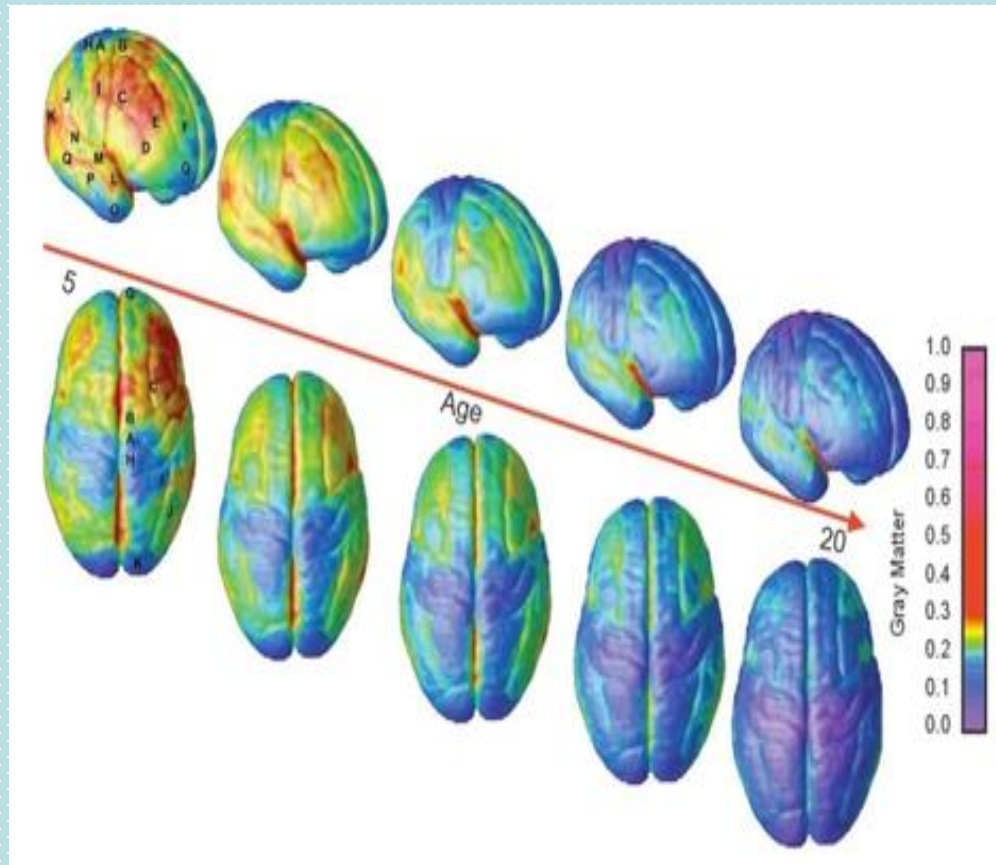


# Possible Changes in Personality & Behavior \*

Injury related problem	How it may affect a person functionally....
Depression	Flat affect, lack of initiation, sadness, irritability
Unawareness	Unable to take social cues from others
Confabulation	“making up stories”
Perservation	Gets “stuck” on a topic of conversation or physical action
Anxiety	Can exacerbate other cognitive/behavioral problems



# “Growing into Brain Injury”



***“Growing” into Brain Injury, without proper supports can lead to mental health and addiction issues that bring people living with hidden TBI into the Public Behavioral Health System***

- When the injury occurs early in life when there are structures and supports in place
- Appropriately, structure offered by school, parents and community fall away as children go through adolescence into adulthood, a TBI incurred at age 7, may not be fully “unmasked” functionally/behaviorally till age 11/12/13 with the challenges of middle school/puberty
- The frontal lobe and temporal tips injured earlier, are unable to adequately respond to the expectations of behavioral regulation and executive skill functioning



# Natural History of TBI to Age 25

(McKinlay et al., 2008)

Developmental

Courtesy of John Corrigan Ph.D.

- 1,265 children born in 1977 in Christchurch, New Zealand and followed to age 25
- Annual assessments from 4 months to age 16, then at 18, 21 and 25
- Verified through medical records all TBIs diagnosed by a professional (MD office, ED, hospitalized)
- 79.3% successfully followed through age 25



# Early Injury as Predictor of Later Problems

- Compared to no TBI and outpatient only, **by early adolescence (10-13 y.o.)** those **hospitalized with a mild TBI before age 6** were:
  - More **hyperactive and inattentive** as rated by parent and teacher
  - More likely dx'd with ADHD, **conduct disorder or oppositional defiant behavior**
  - More likely to have **substance abuse problems**
  - More likely to demonstrate **mood disorders**



# Early Injury as Predictor of Later Problems (continued)

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Courtesy of John Corrigan Ph.D.

Developmental

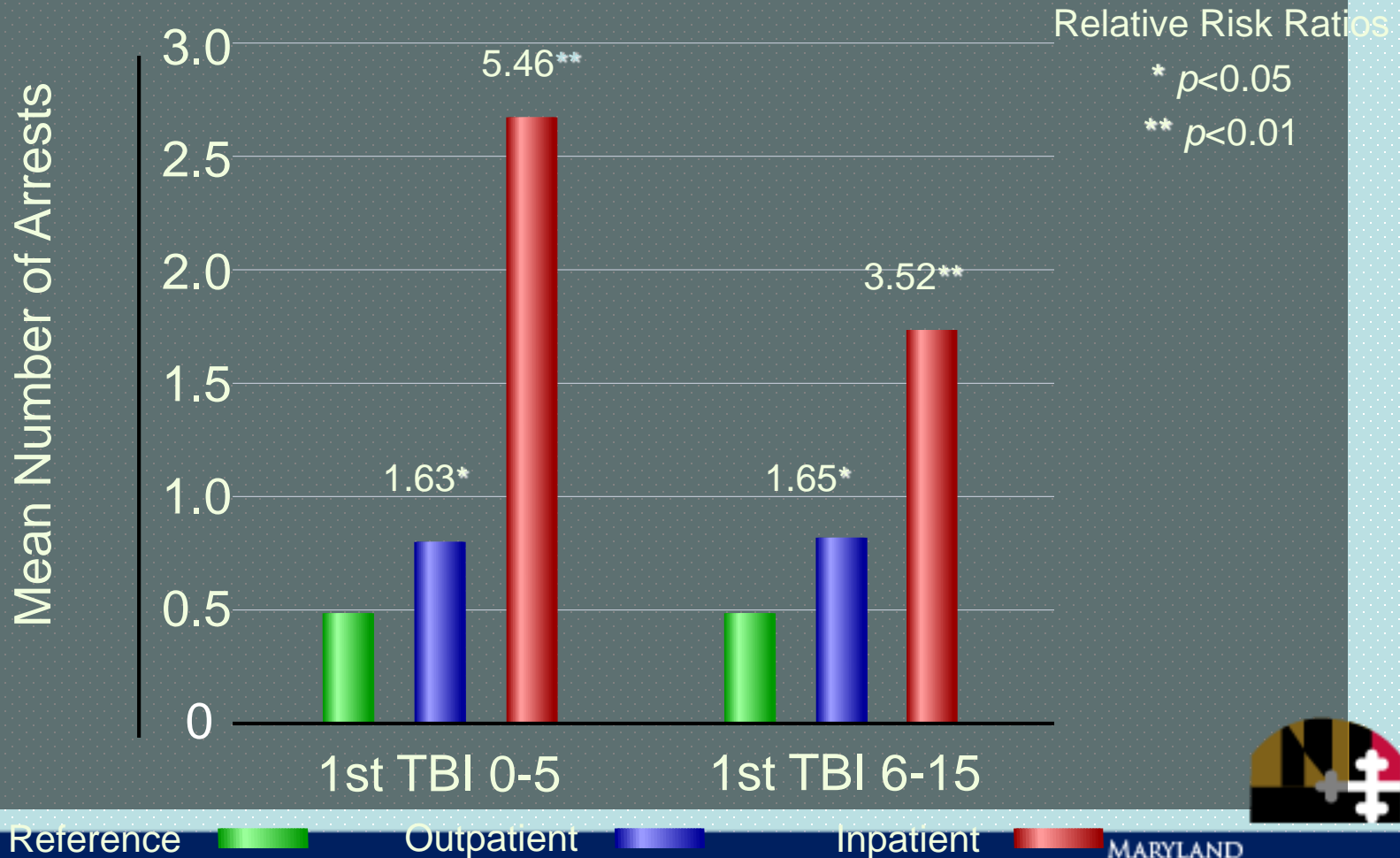
- By late adolescence and early adulthood (16-25 years old):
  - Those hospitalized with 1st TBI before age 6,  
3 times more likely to have a diagnosis of either alcohol or drug dependence by age 25
  - Those hospitalized with 1st TBI 16-21,  
3 times more likely to be diagnosed with drug dependence
  - TBI highly associated with **likelihood of arrest**



# Association between TBI and Arrests

Courtesy of John Corrigan Ph.D.

Developmental







THE OHIO STATE UNIVERSITY  
WEXNER MEDICAL CENTER

## Ohio Valley Center for Brain Injury Prevention and Rehabilitation



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HOME

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PROGRAMS &  
RESEARCH

INFORMATION &  
EDUCATION

MODEL SYSTEMS

OSU TBI-ID

RESOURCES

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Substance Use after TBI:  
Information for Consumers

Consumer Factsheets

SynapShots from OVC

Screening for TBI: A  
SynapShot from OVC

Accommodating the  
Symptoms of TBI

Long-Term Consequences of  
TBI: A SynapShot from OVC

Agitation and TBI: A  
SynapShot from OVC

Substance Use and TBI: A  
SynapShot from OVC

[Home](#) > [Information & Education](#) > "What if There's a Traumatic Brain Injury?" Webinar

## "What if There's a Traumatic Brain Injury?" Webinar

This webinar is intended for behavioral health professionals who want to learn about traumatic brain injury (TBI), why it is important to know a client's lifetime history of TBI, how neurological impairments could interfere with treatment and suggestions for adapting their approach to accommodate those impairments. John D. Corrigan, PhD, Professor in the Department of Physical Medicine & Rehabilitation at Ohio State University and Editor-in-Chief of the *Journal of Head Trauma Rehabilitation* presented this 1-hour training. [CEUs available](#)

### View webinar

The live webinar was presented on Wednesday, February 26, 2014. Please select the appropriate recorded version option for your needs:

- To view the recorded webinar using Firefox, Safari, or Internet Explorer, [click here](#).
- To view the recorded webinar using Google Chrome, [click here](#).
- If you wish to receive APA CE credits, please [visit Give an Hour to watch the video and complete their evaluation](#).

[About CEUs](#)





# Population-based study of TBI among adults in Colorado

Courtesy of John Corrigan Ph.D

- Random digit dialed 2,700 Colorado adults administered computer assisted telephone interview based on OSU TBI-ID
- 200 called back no sooner than 6 months later to verify reliability

42% recalled at least 1 TBI in their lifetime

24% at least 1 TBI with loss of consciousness

6% at least 1 moderate or severe TBI



# History of TBI among Adults in Colorado

Courtesy of John Corrigan Ph.D

Compared to *adults without head injuries* those with at least 1 TBI with LOC were:

- 1.5 times more likely to **experience mental health problems**
- 1.7 times more likely to be **misusing alcohol**
- greater than 2 times more likely to have any **limitation due to physical, mental or emotional problems;**
- greater than 3 times more likely to have a **disability.**



- **Depression** frequent following TBI; depressed clients with TBI **more likely suicidal**.
- Higher rates of **anxiety disorders** (generalized, OCD and PTSD)
- Higher rates of **psychosis** among persons with TBI
- Some studies have found higher rates of **personality disorders** among persons with TBI.
- **Childhood TBI** doubles likelihood of psychiatric disorder by early adulthood.



Courtesy of John Corrigan Ph.D.

*J Head Trauma Rehabil*  
Vol. 27, No. 3, pp. E1-E10  
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# Prevalence of Traumatic Brain Injury in an Offender Population: A Meta-Analysis

*Eric J. Shiroma, MS<sup>1,2</sup>; Pamela L. Ferguson, PhD<sup>1</sup>; E. Elisabeth Pickelsimer, DA<sup>1</sup>*

	Any TBI	TBI with LOC
<b>All screening methods</b>	60.3%	50.2%
<b>In-depth interview</b>	66.9%	52.3%

Based on 20 studies published between 1983-2009  
Estimates are weighted for gender & offender type



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# HBO's "Real Sports" interviews Dr. Ann McKee of BU~10.21.14 on the DV/CTE link

"...many former players who have no history of domestic violence apparently become dangerous to their families as they suffer from chronic traumatic encephalopathy..." NY Daily News

*"These guys used to be fine. They were entirely reasonable at all times of the day. But now these guys are assaultive, they're overreacting. They're paranoid, they're jealous"* Ann McKee MD



The recent movie “Concussion”  
starring Will Smith as pathologist  
Bennet Omalu depicted several  
former players affected by CTE:

*Mike Webster*

*Justin Strzelcyk*

*Andre Waters*

*Dave Duerson*



# Substance Abuse & Brain Injury

*“Alcohol abuse/dependence is the second most common Axis I disorder in persons with TBI”*

*Lowling et.al Journal of Neurotrauma 2014*



# Brain Injury and Alcohol... analysis of research studies on the relationship between alcohol and brain injury found:

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- Between 37-51% of individuals hospitalized for TBI were intoxicated at the time of injury & have a history of alcohol misuse
- Individuals with a history of pre-injury alcohol use have a more complicated course of recovery and generally poor rehabilitation and social outcomes

(Parry-Jones et.al 2006)





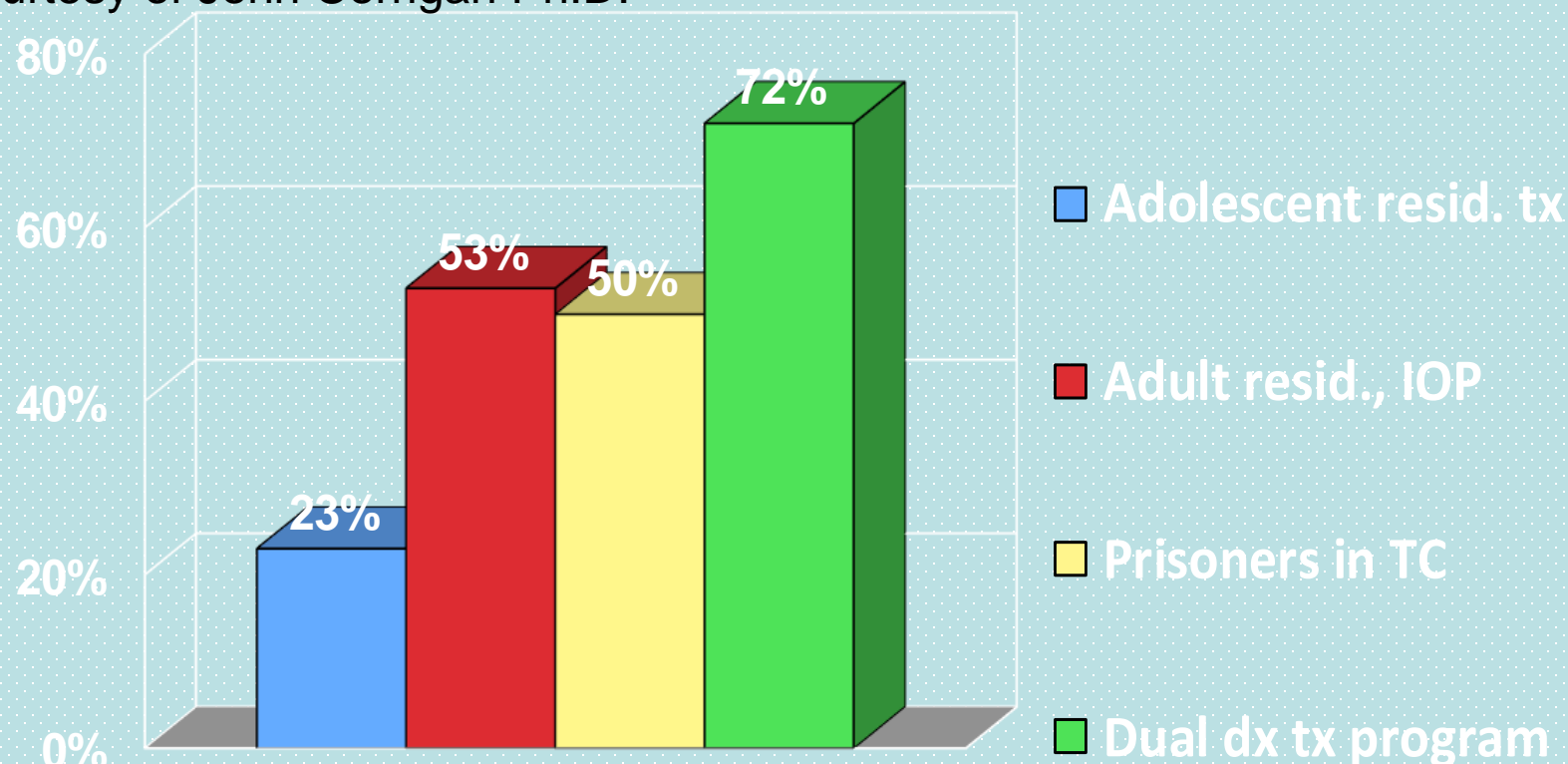
## Corrigan and Mysiw's chapter "Substance Abuse Among Person's with Traumatic Brain Injury" from Brain Injury Medicine, 2<sup>nd</sup> Edition 2012-Key Points

- *"Studies of both brain structure and function indicate that substance misuse and TBI interact in an additive way, specifically, their co-occurrence results in more impairment than either one alone."*
- *"Substance misuse also limits outcomes from TBI by undermining environmental supports such as familial care or access to services."*
- Data from a Finnish birth cohort study have *"reported multiple risk factors associated with incurring a TBI, including that if parents misused alcohol, there was a two-fold greater chance of childhood TBI"*. (possible reasons why??)
- *"When all factors are considered, it would appear reasonable to expect half of the adults under age 65 receiving inpatient rehabilitation for a primary diagnosis of TBI to have prior histories of either alcohol misuse or illicit drug use."*
- Long term consequences; *"Those who also misuse substances face additional complications, including they are less likely to be working, have lower subjective well-being, have an increased likelihood of suicide and an increased likelihood of premature mortality due to any cause and are at greater risk for seizure."*



# Substance Abuse Treatment Clients Who Have Had a TBI with Loss of Consciousness

Courtesy of John Corrigan Ph.D.



# Substance Abuse Treatment Clients with TBI

Courtesy of John Corrigan Ph.D.

(Corrigan & Mysiow, 2012)

- first used at a younger age
- have more severe SUD (worse use and more prior treatments)
- have more co-occurring mental health problems
- have poorer prognosis for successful treatment outcome (more so earlier the age at first TBI?)



# Messages to Share

## Drinking After Brain Injury-Useful for Individuals who are in the Precontemplation or Contemplation Stage of Change

Adapted from Booner and Lamb-Hart

Ohio Valley Center

- People who use alcohol or drugs after TBI don't recover as fast as those who don't
- Any injury related problems in balance, walking or talking can be made worse by using drugs or alcohol
- People who have had a brain injury often say or do things without thinking first, a problem made worse by using alcohol or drugs
- Brain injuries cause problems with thinking, like concentration or memory, and alcohol makes these worse
- After a brain injury, alcohol and other drugs have a more powerful effect
- People who have had a brain injury are more likely to have times when they feel sad or depressed and drinking or doing drugs can make these problems worse
- After a brain injury, drinking alcohol or taking drugs can increase the risk of seizure
- People who drink alcohol or use other drugs after a brain injury are more likely to have another brain injury



# Problematic exposure to TBI implies:

Courtesy of John Corrigan Ph.D.

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Person may have **difficulty accessing services, or remaining engaged in services**, due to barriers created by cognitive and/or behavioral weaknesses.



# Suggestions for Service Providers

Courtesy of John Corrigan Ph.D.

1. Look for neurologically based cognitive and behavioral barriers to treatment.
2. Adapt service provision to accommodate weaknesses.
3. Assist with the development of compensatory strategies.
4. Be cautious **when making inferences about motivation based on observed behaviors.**



# DLA-20 Supplemental Questions Concerning TBI-Adapted for Maryland's use by Corrigan from the TBI OSU-ID

- 3 items capture information about any history of traumatic brain injury (TBI):
  - Whether consumer was ever knocked out or lost consciousness
  - Longest period of time consumer was knocked out
  - Age at which consumer was first knocked out



OSU TBI-ID Ohio Valley Center for Brain Injury Prevention and Rehabilitation - Google Chrome

ohiovalley.org/tbi-id-method/

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Presentation

OSU TBI-ID Form

OSU TBI-ID for Clinical Professionals

OSU TBI-ID for Researchers

Other Sources of Central Nervous System Compromise


Home > OSU TBI-ID

OSU TBI-ID

OSU: TBI Identification Method

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

brainline.org

Presentation produced in partnership with BrainLine, a project of WETA

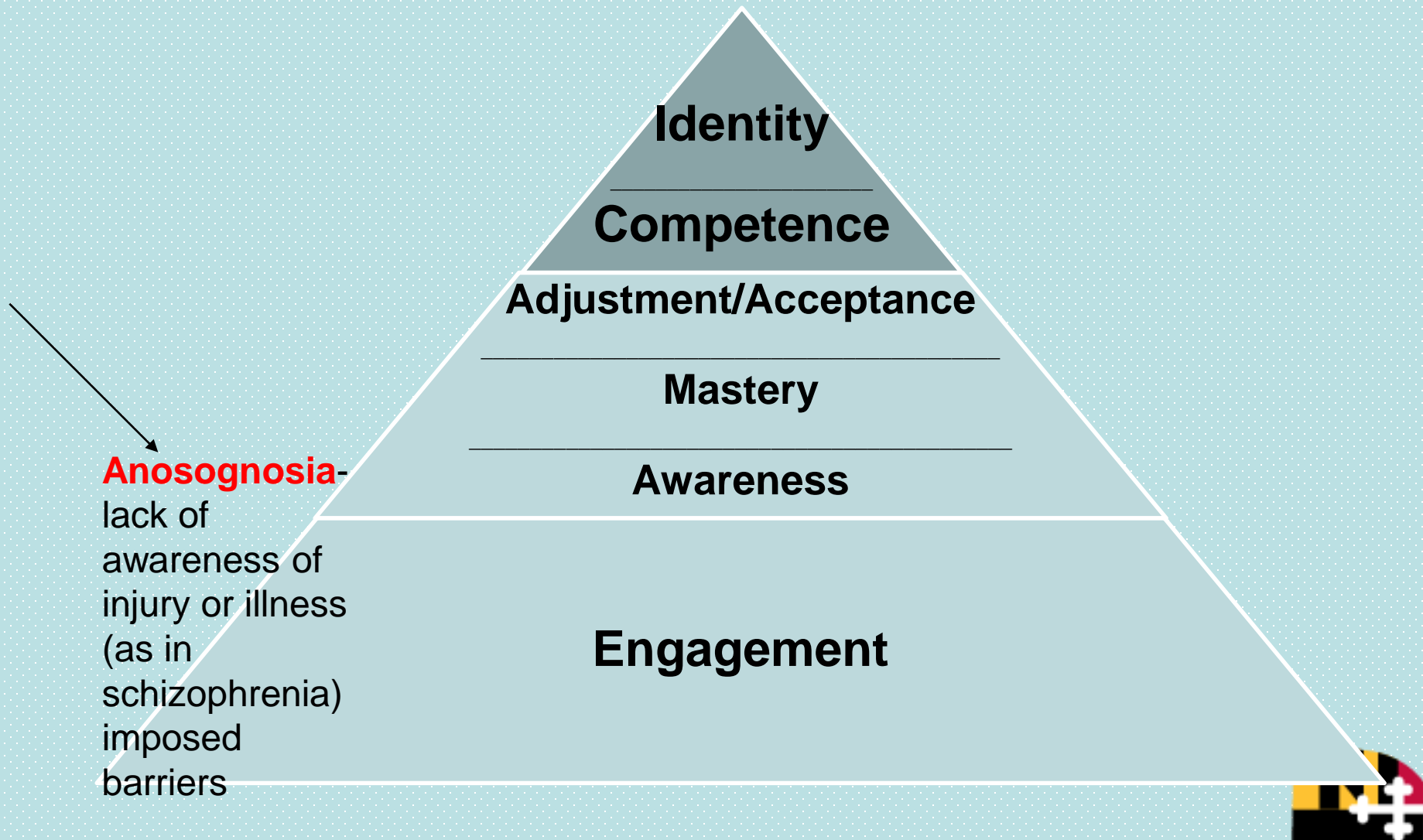
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# A Logic Model for Building a Plan- Accommodating a History of Brain Injury

Adapted from  
Grieder & Adams  
2005





# ***Strategies & Accommodations***



**ONCE YOU KNOW THERE IS A TBI,  
WHAT DO YOU DO ABOUT IT?**



# **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



# To Enhance Memory

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- Structure the environment
- repetition of information, to promote procedural memory



# What can be done

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- 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
- 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.....

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- 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.....

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- 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)



*By Structuring the **Environment**, memory, organization and attention are supported, enhancing independence, reducing frustration, and freeing up cognitive and psychological energy to tackle new challenges at home, work and community*



# Integrating Support for TBI related Behavioral Health Disorders into a Person Centered Care Plan

John is a 35 year old single man who has been diagnosed with major depression, characterized by low mood punctuated by outbursts that seem to come out of the blue. Based on the answers to the DLA-20 supplemental questions regarding TBI, his behavioral health provider conducted the OSU TBI ID in its' entirety, discovering that John had incurred several TBIs in his youth, one from a fall at 6 years old that resulted in a skull fracture and several nights in the hospital, a second fall from a bike at age 12 and a third, also resulting in hospitalization, from injuries received in a fight when he was 28 years old. Both the 1<sup>st</sup> and 3<sup>rd</sup> TBIs resulted in periods of unconsciousness.



**EXAMPLE:** Through a TBI informed lens

- **OBJECTIVE:** “John will yell and/or throw things less than 3 times per day.”

## **GOAL: “I Want to Keep my Job!!**

(Disinhibition and lability are common after TBI with Frontal & Temporal Lobe involvement)

From the Assessment and Narrative Summary, John and his team suspect his anger may be due at least some of time from his difficulty in understanding or remembering what is being asked of or expected from him in new situations (such as working with a new supervisor on the job)

## **Interventions:**

1. John and his case manager Samantha will make an appointment for a consultation with a neuropsychiatrist within 2 weeks.
2. John will ask for clarification/paraphrase back instructions (“want you want me to do is...”) when given new instructions or when he does not understand/remember procedures on the worksite 2x per shift as observed by Marc, his job coach & himself.
3. John will work with Marc to create a template of frequently job tasks he will keep in his phone for easy reference within 2 weeks.
4. John and his psychotherapist will identify at least one meditation or mindfulness strategy (e.g the apps “Breath2Relax” or “Tactical Breather”) and learn how to use it to deescalate his anger within 2 weeks.



# Summary

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- 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.



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# The Brain Association of Maryland

## RESOURCES & SUPPORTS

[www.biamd.org](http://www.biamd.org)





# Maryland Access Point (MAP)

**A statewide resource for  
information and assistance**

**1-844-627-5465**

**<http://www.marylandaccesspoint.info/>**





# Brain Injury Waiver Program

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**Offered through the Department of Health and Mental Hygiene (DHMH)**

- **General Information:**

**What:** Funding for ongoing rehabilitation, housing, staff assistance and supervision, vocational / day programming, and much more.

**For:** Adults with Brain Injury who meet eligibility requirements.

**Where:** Homes are located in one of five Maryland neighborhood communities.

**When:** Upon discharge from University of Maryland Rehab and Orthopaedic Institute, Western Maryland Hospital Center, Deer's Head Hospital, or Charlotte Hall Veterans Home.



# Resources

- Brain Injury Association of Maryland: 410-448-2924, [www.biamd.org](http://www.biamd.org)
- Ohio Valley Center for Brain Injury Prevention and Rehabilitation, 614-293-3802, [www.ohiovalley.org](http://www.ohiovalley.org)
- Brainline, [www.brainline.org](http://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.
- “Returning to Work After Brain Injury, a Strategy Guide for Job Coaches”,  
<http://www.adainfo.org/sites/default/files/compensatory-strategy-guide.pdf>



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A product of the Maryland Behavioral Health Administration  
and the Frederick County Mental Health Management Agency

2017

*Thank you!*



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