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Peer Specialists
Fall 2020 Brain Injury Series

Part 2, Who is Affected by Brain Injury

Martin Kerrigan & Anastasia Edmonston

Welcome Back

Welcome Back to Part II in our Series! Before we dive into who is impacted by Brain Injury in to greater detail,

Are there any questions from what we discussed last week? If so, Please put them in the Chat.

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What we will discuss today…

What populations of people are vulnerable to incurring a brain injury? Put your answers in the chat.

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Who is affected by brain injury?

Broadly:

- People of lower socioeconomic status, especially those without medical insurance
- People who live in rural areas
- Young people
- Older Adults

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Who is affected by brain injury?

- People impacted by the intersection of mental health and brain injury, especially as it relates to suicide
- People who use drugs and alcohol
- People who are justice involved, both adults and children
- People who are homeless
- People who serve in the armed services
- People who are victims and perpetrators of intimate partner violence

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Placing Brain Injury within a larger societal context- considering inequities and disparities

- Inequities are created when barriers prevent individuals and communities from reaching their full potential
- Health disparities are differences in health status related to such factors as; race, gender, income or geographic region

Source: American Public Health Association, https://www.apha.org/topics-and-issues/health-equity
Retrieved on 10.11.20

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Brain Injury Specifically?

Findings of a systematic review of disparities in health care utilization by adults with traumatic brain injuries found:

- Lack of insurance was *significantly* associated with decreased use of in-hospital and post-hospital health care (e.g. follow up therapy) services among people with TBI
- The majority of the studies reviewed found racial/ethic minorities were less likely to use in-hospital and post-hospital health care services
- This review did not find significant relation between race/ethnicity and health care utilization among those with TBI

Source: Gao S, Kumar RG, Wisniewski SR, Fabio A. Disparities in Health Care Utilization of Adults With Traumatic Brain Injuries Are Related to Insurance, Race, and Ethnicity: A Systematic Review. *J Head Trauma Rehabil*. 2018;33(3):E40-E50. doi:10.1097/HTR.0000000000000338

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Brain Injury Specifically?

The Centers for Disease Control and Prevention (CDC) identifies the following regarding Health Disparities and TBI.

- American Indian/Alaska Native children and adults have higher rates of TBI-related hospitalizations and deaths than other racial or ethnic groups (factors include motor vehicle accidents, substance use, and suicide).
- Non-Hispanic black and Hispanic individuals are less likely to receive follow-up care and rehabilitation following TBI than non-Hispanic whites.
- Racial and ethnic minorities are also more likely to have poor psychosocial, functional, and employment outcomes post TBI than non-Hispanic whites.

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Source: https://www.cdc.gov/traumaticbraininjury/health-disparities-tbi.html , retrieved 10.10.20

Brain Injury Specifically?

Those who live in rural areas are more likely to die from a TBI than those in urban areas due to:

- More time to get to care
- Less access to a Level 1 trauma center (Maryland's Shock Trauma for example)
- Lack of TBI specialized programs

Children in rural areas who incur a TBI are more likely to die than children living in urban areas

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Brain Injury Specifically?

People with lower incomes & without health insurance have less access to TBI specialized care. Compared to those with private health insurance, those who are uninsured are less likely to receive common TBI procedures such as :

- Craniectomy & Craniotomy: when surgeons take a part of the skull out to allow the relieve pressure on the brain (Bob Woodruff, ABC journalist who was wounded in Iraq, underwent this surgery)
- Inpatient services, including rehabilitation

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And are...

- More likely to die in the hospital

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Children Post-TBI and Access to Mental Health Care

- Approximately 1.7 million including 50,000 children incur a TBI annually
- Up to 50% of children experience behavioral and psychiatric problems post a brain injury, with problems tending to worsen over time
- Following TBI, children have higher rates of Attention Deficit Hyperactivity Disorder (ADHD), Oppositional Defiant Disorder/Conduct Disorder, substance abuse, mood disorders and anxiety

Source: Moore M, Jimenez N, Graves JM, Rue T, Fann JR, Rivara FP, Vavilala MS. Racial Disparities in Outpatient Mental Health Service Use Among Children Hospitalized for Traumatic Brain Injury. J Head Trauma Rehabil. 2018 May/Jun;33(3):177-184. doi: 10.1097/HTR.0000000000000348. PMID: 29194176; PMCID: PMC6110532.

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Children Post-TBI and Access to Mental Health Care

- According to Moore et.al in a study of 5,674 children hospitalized with TBI, there was no differences by race/ethnicity in mental health utilization during hospitalization
- At 12 months post-discharge from the hospital, minority children insured by Medicaid were significantly less likely to receive outpatient mental health services then non-Hispanic white children

Source: Moore M, Jimenez N, Graves JM, Rue T, Fann JR, Rivara FP, Vavilala MS. Racial Disparities in Outpatient Mental Health Service Use Among Children Hospitalized for Traumatic Brain Injury. J Head Trauma Rehabil. 2018 May/Jun;33(3):177-184. doi: 10.1097/HTR.0000000000000348. PMID: 29194176; PMCID: PMC6110532.

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Children and Youth

QUESTION:

In 2014, an estimated 812,000 children age 17 or younger were treated in U.S Emergency Departments for concussion or traumatic brain injury, alone or in combination with other injuries?

True or False?

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What do you think are the major causes of Childhood Traumatic Brain Injury?

Unmute and raise your hand

Follow up question:

What has been the impact of increased use of child safety seats?

Unmute and raise your hand

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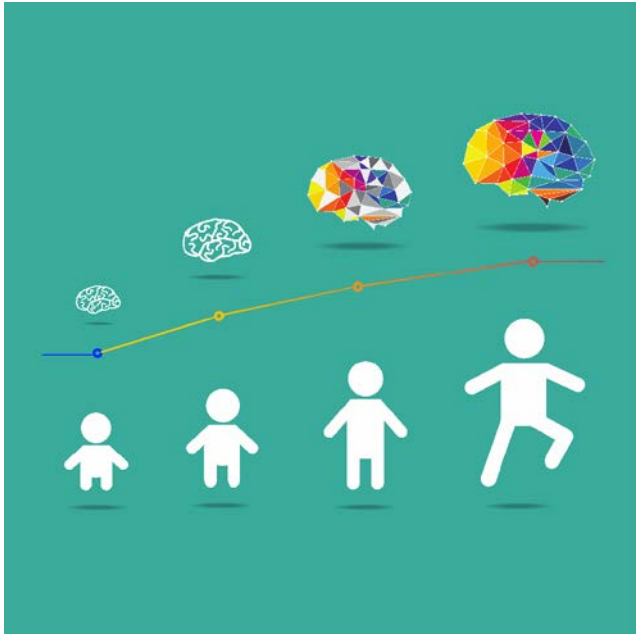
Brain Injury: *Growing* into Brain Injury …



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“Consequences are particularly related to impulsivity and self-regulation”

John Corrigan Ph.D.

Remarks at the September 2018 National Association of State Head Injury Administrators conference, Des Moines Iowa, regarding the consequences of childhood brain injury.

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Youth

By late adolescence and early adulthood (16 – 25 years old):

- Those hospitalized with **first TBI before age six** are three times more likely to have a diagnosis of either alcohol or drug dependence by age 25
- Those hospitalized with **first TBI between ages 16–21** are three times more likely to be diagnosed with drug dependence
    - TBI highly associated with likelihood of arrest

Source: *John Corrigan Ph.D., Ohio Valley Center 2014*

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Youth

Without proper supports, TBI can lead to mental health and addiction issues that bring people living with “hidden” TBI public behavioral health and State vocational rehab services.

- Appropriately, structure offered by school, parents, and community fall away as children go through adolescence into adulthood. A TBI that incurred at age seven may not be fully “unmasked” functionally or behaviorally until age 11, 12, or 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

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Youth

Compared to not having a TBI and outpatient only, by early adolescence (10 – 13 years old) those hospitalized with a mild TBI before age six were:

- More hyperactive and inattentive as rated by parent and teacher
- More likely diagnosed with Attention Deficit Hyperactivity Disorder (ADHD), conduct disorder, or oppositional defiant behavior
- More likely to have substance abuse problems
- More likely to demonstrate mood disorders

Source: *John Corrigan Ph.D., Ohio Valley Center 2014*

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The Silent Epidemic...

- For years brain injury has been referred to as the silent epidemic.
- Even with increased public awareness there is still a great under reporting of brain injury, especially in the systems that many individuals with brain injury end up using.
- This is most likely true in schools as well.
- Often times the individual with the brain injury either is unaware of their brain injury or does not see any connection between their injury and subsequent difficulties

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Brain Injury in Maryland School aged individuals

- According to the Maryland Department of Health, in 2017 there were 4,794 ED visits and 210 hospitalizations for Marylanders ages 0–18 years old with a diagnosis of TBI.
- As of October 2019, there were only 223 Maryland students identified as requiring special education services as the result of a traumatic brain injury.
- This equates to .2% of all students receiving special education services in Maryland.

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What happens to these kids?

consumers of state resources

jails/prisons

hospitals

psychiatric facilities

individuals with substance use disorders

homeless

future brain injuries

victims of abuse

abusers

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How do these kids end up here?

- Lack of understanding
- Unaware of brain injury
- Adequate resources do not exist
- Professionals unaware of brain injury
- Acceptance
- inappropriate social behavior
- Struggles with school
- Easy target

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Older Adults and Brain Injury

Risks and Consequences of Aging with a Brain Injury

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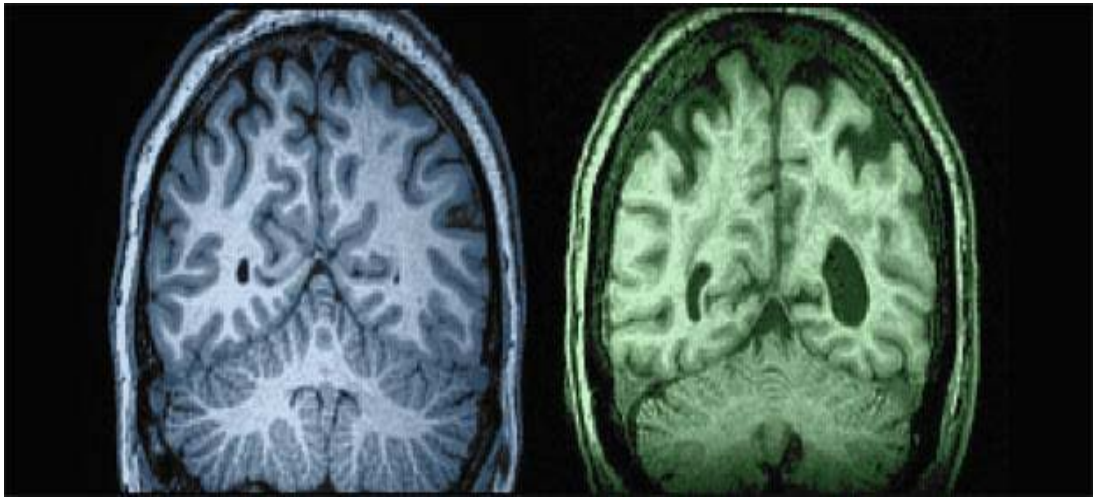
Older Adults

Structural changes in the brain make the older brain vulnerable.



Source: *http://discovermagazine.com/2012/oct/16-brutal-truths-about-the-aging-brain*

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Adults-65 and Older, a growing population

- In 2014 Older Adults made up 14.5% of the population, 46.3 million
- In 2060, the country's population of Older Adults is expected to reach 98 billion or 23.5%

Older Adults and Traumatic Brain Injury

- Four in five (81%) TBI-related ED visits in older adults aged 65 years and older were caused by falls
- Falls are the leading cause of death for persons 65 years of age

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Older Adults

- In Maryland data suggests:

  Increases in unintentional overdose deaths

  Higher percent of opioid prescriptions

  Increase in completed suicide among older adults

  Increase in utilization of public behavioral health services, for both mental health and substance use disorders, with the most dramatic increase noted in utilization of substance use disorder services between 2015-2019, this being said, Older Adults are still a small portion of individuals served by the public behavioral health system

Source: University of Maryland, School of Medicine

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Cost of Falls

Haddad, Bergen and Curtis published a study in 2019 that looked at the economic burden related to older adult falls. The authors report that the direct and indirect medical costs of 3.2 nonfatal falls in the year 2015 to Medicaid is estimated to be **$31.3 billion**

Source: *Journal of Public Health Management and Practice 2019*

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Why are Older Adults at Risk of Having a Brain Injury?

Please put your thoughts in the chat

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“Despite this high incidence, older adults may be less likely to seek medical attention for TBI and are also less likely to be accurately diagnosed even when medical attention is sought”

WHY?

Source: *Journal of Neurotrauma (2018)*

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Brain Injury is Sneaky!

- One Family's Story
- The Good News

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Is anyone today supporting an older adult who has a history of brain injury, even years ago?

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Aging with a Brain Injury

A gentleman living with TBI for almost 30 years:

- Received services for a severe TBI over 30 years ago
- In 2013 came to the attention of the behavioral health state administration, family could not support him any longer
- Accessed a specialized Brain Injury program and through excellent neuropsychiatric and community services began working at a local supermarket
- A few years ago , the medication that controlled his TBI related psychosis was not being metabolized adequately by his liver and he experienced elevated ammonia in his system that further impacted his cognition

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TBI and Dementia

"… TBI is now a well-established risk factor for neurodegenerative diseases of aging, including Alzheimer's and Parkinson's Disease, but mechanisms are poorly understood."

Source: *Journal of Neurotrauma 2018*

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"Conceptually and making the assumptions that the brain has a finite capacity for recovery and adaptation and that both TBI recovery and aging utilize the same plasticity mechanisms, a brain after TBI may have fewer resources to devote to the aging process"

Source: *Geriatric Psychiatry, April 24, 2019, Vol. 36 issue 4*

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Mental Health and Brain Injury

Including the link between TBI and Suicide

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Mental Health

- Depression is frequent following TBI; depressed individuals with TBI are more likely to be suicidal
- Higher rates of anxiety disorders (generalized, Obsessive Compulsive Disorder 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

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Traumatic Brain Injury mortality among US Children and Adolescents 1999-2017

- Since 2013, a gradual increase in pediatric TBI mortality
- TBI mortality rates were found to be higher among; boys, older children, and children in rural areas
- **This trend primarily driven by rise in suicide and homicide by firearm among those 10-19 years old, with 96% of suicide morality related to firearms**

Suicide and Brain Injury

A large Danish study found:

- Higher suicide rate among individuals whose first TBI occurred in young adult hood
- Risk of suicide higher after TBI than fractures

Source: JAMA. 2018 Aug 14; 320(6): 580–588.
Published online 2018 Aug 14. doi: 10.1001/jama.2018.10211: 10.1001/jama.2018.10211

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Concussion and Suicide

The results of a 2016 Canadian study published in a *Washington Post* article by Erin Blakemore in February 2016 found the following:

- The long-term risk of suicide increases three-fold among adults who have had concussions
- Found suicide rate of 31 deaths per 100,000 —three times the population norm
- The meantime, between a mild concussion and suicide was 5.7 years with each additional concussion raising risk of suicide

Before we break, are there any questions about anything we have covered so far?

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Break Time! Take 10 minutes to stretch etc.

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Substance Use and Brain Injury

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Substance Use Disorders

"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."

Source: *Corrigan and Mysiw's chapter "Substance Abuse Among Person's with Traumatic Brain Injury" from Brain Injury Medicine, 2nd Edition 2012-Key Points*

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Substance Use Disorders

Among substance abuse treatment clients with a TBI:

- First used at a younger age
- Have more severe Substance Use Related Disorder (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?)

Source: (Corrigan & Mysiw, 2012), courtesy of John Corrigan Ph.D

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Substance Use Disorders

"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."**

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Brain Hypoxia- a loss of oxygen

- The frontal lobe is highly susceptible to brain hypoxia (reduced oxygen)
- Frontal lobe damage leads to potential loss of executive functions which are often required to participate, engage, and thrive in treatment
- As a result of frontal lobe damage, survivors of overdose may have issues with noncompliance, poor follow through, or a lack of engagement
- Decreased ability to participate and engage in substance treatment puts these individuals at increased risk for relapse

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Opioid Overdose Impact

What is known and observed regarding the impact of opioid overdose and the brain:

- Sudden loss of oxygen to the brain has the greatest effect on parts of the brain that are high oxygen users such as the hippocampus, basal ganglia, and frontal region among others
- These areas of the brain are oxygen “hogs” and are critical to memory, learning and attending to new information, problem solving, and the ability to manage our emotions and impulses — in other words, they are responsible for our adult thinking skills

Source: *Adapted from Ohio Brain Injury Program/John Corrigan PhD, 2017*

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Uncovering a hidden history of brain injury using Maryland's

Local Overdose fatality Review Case Report

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Hypothetical ODFR case review through a Brain Injury Informed Lens

Often when a case is chosen for review, there isn't a lot of information regarding the decedent's history before the team meets. However, there may be some information that the team is given in advance that can prompt questions to bring up during the ODFR meeting that might offer some clues that the individual was living with a history of brain injury

Hypothetical ODFR case review through a Brain Injury Informed Lens

A 49 year old man passed was found unresponsive in his room by a housemate. The roommate initiated CPR and called 911. First responders arrived and were unable to restore breathing. The roommate told the first responders he had been drinking the night before and the roommate believed he had snorted heroin as well. Additional information about the decedent's past and recent history include a bout of meningitis at the age of 10 that required hospitalization, poor academic performance that began in middle school. Around this time his parents reported he began using alcohol and marijuanna. In high school he was involved in a car accident, the driver of the vehicle died and he was hospitalized with a serious concussion.

Hypothetical ODFR case review through a Brain Injury Informed Lens

Additional information available to the ODFRT

- Dropped out of high school
- Worked periodically as a delivery driver for local florists and pharmacies as well as a auto part company
- Maryland case search reveals several short term stays in the county detention center for theft, assault and battery
- On several occasions he entered outpatient treatment but left prematurely, on at least one of those occasions it was reported he had conflicts with fellow group members

Breakout rooms, please take 10 minutes to review what is known about this individual and what are the missed opportunities for intervention through a brain injury informed lens

1. Each team assign a reporter
2. Each team identify 2-3 recommendations for services and supports that may have benefited this individual
3. Once back in the main room, the reporter shares the recommendations

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Asking Brain Injury Informed Questions

- Any health or learning related challenges before the age of 10
- Did his family and health care providers notice any changes in his academic or social functioning following his hospitalization for meningitis?
- Similarly, were any changes noted in his academic or social functioning after the car accident in high school?
- Are there any reports/records regarding specific areas of his brain that were affected in the accident?
- Did he have any pain/chronic pain following the car accident, headaches, orthopedic pain? Trouble sleeping, was he prescribed any medications
- Is there anything known about prior survived overdose(s)

Brain Injury Facts pertinent to this case

- Bacterial Meningitis can cause an acquired brain injury (ABI) According to the Centers for Disease Control and Prevention, “Meningitis is an inflammation (swelling) of the protective membranes of the brain and spinal cord” and can cause long term academic problems, motor and visual challenges, as well as behavioral health problems such as anxiety disorders and attention deficit hyperactivity disorder (ADHD)
- Traumatic Brain Injury (TBI) is an insult to the brain caused by an external force, such as that which occurs in a motor vehicle accident

Justice Involved Individuals and Brain Injury

Adults and Juveniles

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“The Surprising Connection Between Brain Injury and Crime” Dr. Kim Gorgens

Video

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Brain Injury prevalence and incidence in among justice involved adults and juveniles

- Meta-analysis found prevalence of brain injury in juvenile justice system to be an average of 44% (Dijkers & Seger, submitted)
- Incidence in adult incarcerated populations is reported to range from 41-51% (Farrer & Hedges; 2011) to 60.25% (Shiroma, Ferguson, & Pickelsimer, 2010) to as high as 82% (Scholfield et al., 2006)
- Individuals with brain injury report greater numbers of incarcerations than those without brain injury (Piccolino & Solberg, 2014)
- In a 2014 article in the *Journal of Adolescent Health*, newly admitted adolescents to the New York City jail system found that **50 percent of the male** juveniles and **49 percent of the females** had a history of TBI

Sources: Judy Dettmer, National Association of State Head Injury Association's State of the State Conference 2020

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Incarceration

- 831 males admitted into Indiana state prisons were screened for a history of TBI using the Ohio State University TBI Identification Method. Researchers found that 35.7 percent of the inmates reported a exposure to TBI during their lifetime

- For those with a positive history of TBI, they were more likely to have a psychiatric disorder and prior incarceration

Source: *Journal of Forensic Science, 2014*

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“TBI can create challenges to managing offenders and to their successful community reentry upon release.”

Source: *Shiroma, Feguson, Pickelsimer 2012*

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In the Chat-we will answer these one at a time

Based on what you have learned about brain injury and its consequences, please comment in the chat regarding:

- What might be challenges to individuals who are incarcerated who are living with a history of brain injury?
- What are the challenges for someone transitioning to the community upon release from prison or jail?
- Any thoughts on how to support individuals with brain injury related challenges both while incarcerated as well as upon release to the community?

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Homelessness and Brain Injury

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Homelessness

2015 study:

- Of 229 veterans seeking homeless services, nearly all (83 percent) had sustained at least one TBI prior to their first episode of homelessness
- Of these veterans, 43 percent sustained at least one TBI following their first episode of homelessness
- Median lifetime number of TBIs incurred was three
- 30 percent of the veterans sustained injuries with severity levels that would be expected to be associated with ongoing TBI-related deficits

Source: *Barnes SM, Russell CM, Hostetter TB, et. al. "Characteristics of traumatic brain injuries sustained among veterans seeking homeless services" Journal of Healthcare for the Poor and Underserved, 2015 Feb;26(1):92-105. doi: 10.1353/hpu.2015.0010*

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Homelessness *(continued):*

- 73 percent of the men had their 1st TBI before adulthood
- For 87 percent of these individuals, TBI incurred prior to homelessness
- Mechanism of injury; assault, sports/recreation, Motor Vehicle Accident (MVA), fall. Positive screen (+) associated with history of arrest or mental illness and parental history of substance use disorders

Sources: *Hwang SW, Colantonio A, Chiu S, et al. The effect of traumatic brain injury on the health of homeless people. CMAJ : Canadian Medical Association Journal. 2008;179(8):779-784. doi:10.1503/cmaj.080341.*

Topolovec-Vranic J, Ennis N, Howatt M, et al. Traumatic brain injury among men in an urban homeless shelter: observational study of rates and mechanisms of injury. CMAJ Open. 2014;2(2):E69-E76. doi:10.9778/cmajo.2013004

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Homelessness

Canadian Studies 2004 and 2014:

- Researchers screened 904 individuals receiving services in homeless shelters and meal services for a history of TBI. Over half (53 percent) of the individuals had a lifetime prevalence of TBI
- In a subsequent study, researchers screened 111 individuals at an urban men's shelter finding
- 45 percent screened positive for a history of TBI

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Reflection Questions-place answers in the chat

- Why are people who are homeless vulnerable to incurring a brain injury?

- Given what you have learned about the impact and consequences of living with brain injury, why do you think it may be difficult for individuals who are homeless to seek, obtain and maintain stable housing?

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Intimate Partner Violence and Brain Injury

Victims and Perpetrators

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Domestic Violence

People who are victims of domestic violence often have TBI from hitting, choking, etc.

- Studies have suggested the perpetrators also are likely to have a history of TBI
- It is difficult for those who have been abused, especially over a long period of time, to organize a plan to leave, due not only to emotional distress and economic considerations, **but also because the parts of their brains responsible for planning, organizing, and remembering have been damaged.** Victims may have impulse control problems themselves. *"She gives as good as she gets"*

Source: *Adapted with permission from Anne McDonnell, Brain Injury Association of Virginia 2010*

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Domestic Violence

Several studies have investigated characteristics of women who have been abused but experience poor outcomes in domestic violence programs. Typical descriptions include:

- Unmotivated
- Unfocused
- Poorly organized
- Unable to plan ahead
- Unable to follow a train of thought
- Forgetful

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Brain Injury Common in Domestic Violence Video from the Ohio State University and the Ohio Domestic Violence Network

https://youtu.be/zp7uBCJ6Sko

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Debrief: What are your takeaways from this video? Put them in the chat

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Dr. Javier Cardenas of the Barrow Neurological Institute

“The similarities between this population (domestic violence affected individuals) and the professional athlete is astounding”

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Several studies report that among perpetrators of domestic violence:

Present high-

- Mental rigidity (inflexible thinking)
- Poor ability to inhibit responses
- Reduced processing speed of information presented to them
- Impairment in several aspects of memory, short and long term
- Executive skill dysfunction

Suspected factors related to these cognitive challenges-

- History of TBI, alcohol use and/or dependence- with the evidence suggesting that the higher the level of alcohol intake, the more likely the perpetrators were to have attention and cognitive empathy deficits

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Source: https://www.neurologia.com/articulo/2013141/eng, Vitoria-Estruch S, Romero-Martínez A, Lila M, Moya-Albiol L. Differential cognitive profiles of intimate partner violence perpetrators based on alcohol consumption. Alcohol. 2018 Aug;70:61-71. doi: 10.1016/j.alcohol.2018.01.006. Epub 2018 Jan 31. PMID: 29800781.

Service members/Veterans and Brain Injury

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Service members

- During peacetime, over 7,000 annually admitted to military and veterans hospitals with diagnosis of TBI (IOM, 2009)
- 80 percent of TBIs since Sept. 11, 2001 have been non-combat related
- More common among non-combat military personnel than in the general population:
  - High concentration of service members in the highest incidence age groups (18 – 44)
  - Greater risk for injury associated with non-combat military duties
  - Greater consumption of alcoholic beverages by military personnel

Corrigan 2014

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Service Members

In 2017, a study of 167 older veterans found:

- Veterans with remote history of TBI had slowed processing speed
- Poorer attention/working memory, executive functioning, and learning memory
- Trouble with processing speeds and executive functioning was found with those who had experienced multiple mild TBIs or any moderate to severe TBI — these findings were not duplicated among those with a single mild TBI
- Veterans with TBI more likely to have history of depression, and substance abuse, had more current depressive and Post Traumatic Stress Disorder (PTSD) symptoms

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Service members & Opioid Use

- A study of 53,124 veterans of Iraq and Afghanistan with chronic pain looked at the rate of prescribed opioids for those veterans living with and without a history of TBI. Those with a history of TBI were more likely to be prescribed opioids
- Those veterans with chronic pain, a moderate to severe TBI as well as other mental health comorbid conditions such as post-traumatic stress disorder and depression had an even greater risk of initiation of long term opioid therapy

Sources: *Hammond, F. M., Dams-O'connor, K, Ketchum J et al (2018). Mortality secondary to accidental poisoning after inpatient rehabilitation for traumatic brain injury study: A NIDILRR Traumatic Brain Injury Model Systems Study.*
Manuscript in Preparation.

Seal, K.H., Bertental, D. E., Byers, A. L., et al (2018). Traumatic Brain Injury and receipt of Prescription Opioid Therapy for Chronic Pain in Iraq and Afghanistan Veterans: Do Clinical Practice Guidelines Matter? The Journal of Pain, August; 19(8):931-934

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Accept the challenge!

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Breakout Rooms- Teams develop questions to challenge each other's Brain Injury knowledge!

Each team will come up with one "closed answer question," for example:

"The sky is_____ when the sun is shining." (correct answer is "blue")

And one multiple choice question, for example:

"The Maryland State bird is the:

a) Blue Bird
b) Raven
c) Oriole

(correct answer is "Oriole")

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Teams come back from the breakout rooms and will try to stump each other with the questions they have developed.

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Wrap Up

- Questions
- Comments
- Any suggestions for us regarding a topic you would like us to cover related to brain injury in upcoming sessions?

Part III: Screening and Support

Next week we will look at:

How to screen for a history of both traumatic and acquired brain injury using a simple tool. We will also cover how to support individuals through simple strategies and accommodations.

See you then!

Thank you!!!

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