Brain Injury and Co-Occurring Conditions

Brain Links

Tennessee Brighter Futures

No two brain injuries are alike. Brain injury often does not occur alone. It can lead to other problems and it can come from another problem. These common co-morbidities must be recognized and understood so that we can more effectively treat people from all systems of support and potentially prevent downstream consequences.

In the Quick View below, a fact is given about 9 systems of support (purple boxes) and 5 social determinants of health (green boxes), showing their connection to brain injury.

Quick View

Adverse Childhood Experiences: Toxic stress from ACEs exposure can alter brain development and lead to risky behaviors increasing risk of TBI.

Mental Health (MH): 50% in treatment have a brain injury. 80% in MH & SUD treatment have a history of brain injury.

Substance Use Disorder (SUD): About 50% in treatment have a brain injury. 80% in MH & SUD treatment have a history of brain injury.

Criminal Legal System: 50-87% have had a traumatic brain injury (TBI).

Racial Minorities: More likely to sustain a TBI and have worse outcomes.

Domestic Violence (DV): As high as 20 million women each year could have a TBI caused by DV.

BRAIN INJURY

Disability: Over 5 million in U.S. have brain injury-related disability.

Homelessness: Over 50% who are homeless or in an insecure living situation have a TBI.

Aging: Over 1 in 50 Americans 75+ experience a TBI-related ED visits, hospitalizations or death.

Child Abuse: Abusive Head Trauma is a leading cause of physical abuse deaths in children under 5 in the U.S.

Juvenile Justice: As high as 67% of detained youth have a history of brain injury.

Rural Health: Those in rural areas are at higher risk of sustaining a brain injury.

Pain: About 60% of people with TBI develop chronic pain.

Veterans: Veterans with TBI have higher rates of PTSD, depression, SUD and anxiety disorder.

NEW BRAIN INJURIES IN THE U.S. EACH YEAR

Brain Links

Traumatic Brain Injury - Pediatric (TBI) → **5.2 million***
Emergency department (ED), inpatient and outpatient

Traumatic Brain Injury - Adult → **12.6 million***
Emergency department, inpatient and outpatient

Traumatic Brain Injury - Military → **19,167**

Stroke → **795,000**

Brain Tumors → **90,000**

Dementias → **514,000****

Total: = **19,218,167 new brain injuries/year**
★ **or 5.6% of the U.S. population**

Prevalence

The total number of people **living with *traumatic* brain injury** in the United States:

★ **64,000,000**
or 18.7% of U.S. population

The number of **all causes of** brain injuries is even higher.

Drug Overdose with Anoxia: In 2023, 105,007 people died from overdose. Many more survived and many survived multiple overdoses. Studies suggest there are between **15-50 survivors for every death.** A New Hampshire task force found that 90% of survivors had an anoxic injury. Until there is improved data, there is a wide range (between 1.6 and 4.84 million) of new anoxic brain injuries each year.

Brain injury can also include these nontraumatic causes:

- Brain infection
- Metabolic disorders
- Epilepsy/Seizure disorder
- Neurotoxic poisoning
- Congenital injuries
- Near drownings and others

We do not have accurate numbers for these types of injuries. There are also brain injuries that occur before birth that are not considered "acquired brain injuries," but they are still brain injuries and may benefit from accommodations.

***An unknown number will not seek care but may still have an injury that produces lasting or prolonged changes.** The CDC says: "Current data sources may capture only 1 out of every 9 concussions across the nation."

****Dementia is different from other brain injuries in that it is a progressive disease.** It will still impact community providers' treatment. They need to screen for neurocognitive impairment.

Adverse Childhood Experiences (ACEs) Produce Brain Changes

ACEs are not brain "injuries", but they can produce developmental brain changes. Similar to brain injury, changes may include: emotional, behavioral, cognitive and mental health challenges. Also, like brain injury, accommodations, or strategies, may be helpful in supporting people with ACEs.

EACH SYSTEM AND ITS CONNECTION TO BRAIN INJURY

Where we see many of the people living with brain injuries throughout our communities

Adverse Childhood Experiences (ACEs)

- **61% of adults** have experienced at least 1 ACE. 16% of adults have experienced **4 or more ACEs. ACEs occur across all demographic groups.**
- Toxic stress from ACEs exposure **can alter brain development** and look like impulsivity, poor judgment, and quick to anger.
- **Brain changes** from ACEs can lead to risk-taking behaviors, **increasing the risk of TBI** as an adult. ACEs can also lead to **neurologic decline** later in life.

Mental Health

- **6 months to 1 year** following an injury: **one third** will experience a mental health problem – **that number will grow over time.**
- People with **brain injury** have a **2-4 times** increased risk of attempting or having death by suicide.
- As high as **80%** of people seeking mental health **and** substance use treatment also have a **brain injury.**

Substance Use Disorder

- **About 50% of the people in Substance Use (SU) treatment have a brain injury.**
- About 80% of people who need **both Mental Health and SU treatment** also have a brain injury.
- 72% of people in inpatient treatment for brain injury are **given an Rx for opioids.**
- Within one year after injury, **10-20% will develop a SU problem** & that number will grow over time.
- **For every overdose death**, there are approximately **fifty overdose survivors, 90% of whom become impaired** because of insufficient oxygen to the brain.

Domestic Violence

- **It is estimated that millions of women each year may sustain a brain injury caused by domestic violence.**
- In 1 study of women who experienced DV, **85% experienced blows to the head**; for **50% of them,** it was **too many times to count**.
- In the same study, **83% were strangled** (which can lead to a **brain injury** from lack of oxygen), **88% were strangled multiple times.**
- **Men are victims of domestic violence, too.** 26% of men report domestic abuse in their lifetime.

Juvenile Justice

- **As high as 67% of detained youth have a history of brain injury.** For most, the brain injury occurred **before the criminal offense**.
- Youth with a TBI have a **69% higher chance of re-offending**.
- Juvenile offenders are almost **3.4 times more likely to have a TBI** than non-justice-involved youth.

Criminal Legal System

- **50-87% of people in the Criminal Legal System (CLS) have had a traumatic brain injury.** (Compared with **8.5% in the general population**)
- People with TBI are **12 times less likely** to achieve a discretionary release.
- Nearly **100% of women** in the Criminal Legal System have a history of TBI. (Many from DV)

Chronic Pain

- **About 60% of people with TBI develop chronic pain.**
- People with TBI are **at 11 times greater risk** of accidental overdose.
- Common problems following **brain injury**, like **poor judgment, memory and increased impulsivity** make it harder to self-regulate substance use and **make overdose more likely.**

Homelessness

- **Over 50% of people who are homeless or in an insecure living situation have a TBI. (25% were moderate to severe) This is 10 times higher than the general population.**
- Most will experience their 1st TBI **before** becoming homeless.
- TBI in people who are homeless is associated with **poorer physical and mental health, higher suicidality and suicide risk, memory issues, more health service use and higher criminal legal system involvement.** People with **cognitive impairment** are likely to **spend more time unhoused** than those without cognitive impairment.

Child Abuse

- **30-60% of perpetrators of Domestic Violence also abuse children in the household.**
- "Abusive Head Trauma (AHT) is a leading cause of physical **child abuse deaths in children under 5** in the United States." **(One-third of all child maltreatment deaths.)**
- Consider that the **parent/caregiver** of a child involved with the Child Welfare System **may have had a brain injury.** The best practice ideas to follow should be applied to both children and parents/caregivers.

Aging Health

- Nationally, people age 75 years and older have the **highest numbers and rates of traumatic brain injury-related hospitalizations.**
- **Over 1 in 50 Americans aged 75 or older experience a TBI-related ED visit, hospitalization or death.**
- Each year, there are about **3 million emergency department visits** because of falls in older adults. **More than half** will not tell their doctor.

Veterans

- **19,547 military members** diagnosed with TBI in 2023.
- **Service members with TBIs have higher rates of PTSD, depression, substance use disorder, and anxiety disorder than those without TBI.**
- **Veterans with mTBI** (mild) had greater combat exposure; less social support; and more comorbidities, including asthma, PTSD, sleeping problems, worse pain scores and slower processing speed.

Disability Health

- **1 in 4 Adults** in the US reported having a disability in 2022. (cdc.org)
- **Over 5 million people in the United States have a disability related to brain injury. This is 1 in 60 people.** (biausa.org)
- Just over 47% of people 40 or older with a history of brain injury live with a **disability in at least one area of functioning.** (Schneider, Wang, et al., 2021).
- Disabilities following brain injury often cannot be seen. For this reason, brain injury has been **called the "silent epidemic" for decades.**

Rural Health

- **60 million (1 out of 5) people live in rural America, making the problems with TBI management and resources a major public health concern.**
- **Contributing factors to higher rates of brain injury:** Environmental issues (poorer road conditions, unpredictable weather and livestock and wildlife), drinking and driving, and substance use.
- **Poorer outcomes result from:** Longer travel times to emergency care, lack of access to level 1 trauma centers, lack of specialized brain injury care and high cost of healthcare in rural areas.

Minority Health

- **People in racial and ethnic minorities are more likely to sustain a traumatic brain injury, & more likely to have worse outcomes.** Reasons for higher rates of TBI include: Motor vehicle accidents, substance use, suicide and domestic violence.
- In Tennessee, Hispanics have the highest proportion of **work-related TBIs.**
- People who are Hispanic or Black are more likely to drop out of long-term studies and are **less likely to receive follow-up care and rehabilitation** for a variety of reasons.
- **Native American & Alaskan Natives** have the highest rate of TBI & fatality from TBI.

RECOMMENDATIONS FOR BEST PRACTICE ACROSS ALL SYSTEMS

BEST PRACTICE

Frontline Providers should:

- **SCREEN** for prior history of brain injury
- **ASSESS** neurocognitive and functional impairment
- **EDUCATE** staff on brain injury
- **EDUCATE** the person about their brain injury
- **PROVIDE** and **TEACH** accommodations
- **CONNECT** person served with community resources

COMMON PROBLEMS

After Brain Injury, we often see problems with:

- Attention, memory and new learning
- Slowed speed of processing
- Organization, problem solving and impulsivity
- Irritability, frustration and agitation
- Balance, dizziness and headaches
- Poor awareness of deficits & difficulties
- Difficulty being flexible, poor self-monitoring

WHAT TO LOOK FOR

Frontline Providers may see:

- Looking uninterested because they cannot pay attention
- Appearance of defiance because they cannot remember the rules
- Slow to follow directions because they cannot process quickly
- Getting into fights because of irritability, anger and impulsivity
- Falling into things, often getting hurt
- Difficulty re-entering community because of cognitive changes
- Getting stuck on an idea or a way of doing something, not recognizing mistakes

COMMON ACCOMMODATIONS FOR BRAIN INJURY CHALLENGES

Here are some common and simple accommodations:

For the person:

- **Working for shorter periods of time**
- **Getting rid of distractions around you, like noise or movement**
- **Taking notes (on paper, in a notebook, on a phone or computer)**
- **Using a phone to set timers to remember appointments**

For the care provider:

- **Repeating information to the person**
- **Slowing down when talking; giving them more time to respond**
- **Giving the person a list of house rules, written directions, or pictures to help them understand and remember**
- **Coaching the person with the injury to "Stop, think and plan" *then* act**
- **Coaching the person to take deep breaths when feeling angry or anxious**

TOOLS FOR BEST PRACTICE

Brain Injury Screening Resources:

- **NASHIA's Online Brain Injury Screening and Support System (OBISSS):** https://www.nashia.org/obisssprogram The OBISSS is highly recommended. It is made up of the OSU screening tool, a Symptoms Questionnaire and Strategies. It can be used electronically, on a computer, phone or iPad. It can be self-administered.
- **OSU TBI Identification Method - Modified: Modified** to include brain injury from all causes. https://www.tndisability.org/primary-emergency-care-providers

Brain Links' Strategies & Accommodations Tool: https://www.tndisability.org/rehabilitation

Symptom Questionnaire and Cognitive Strategies:

- Adults: bit.ly/3FLkz0V
- Juvenile: bit.ly/4iS2bSC

TENNESSEE RESOURCES

Brain Links' Website with many resources https://www.tndisability.org/brain

Brain Links' Toolkits (for Service Professionals and Survivors) https://www.tndisability.org/brain-toolkits

TN Department of Health TBI Program https://tinyurl.com/3v5jrdt3

Tennessee Brighter Futures' Resource Pages & Training for Brain Injury https://www.tndisability.org/tbf-brain-injury

Tennessee Brighter Futures
More information on the collaborative & resources for all systems of support https://www.tndisability.org/tennessee-brighter-futures

TN Brighter Futures is organized and facilitated by Brain Links through a contract from the TN Department of Health TBI Program.

For a list of selected references, visit Brain Links:
https://www.tndisability.org/tbf-brain-injury

Brain Links https://www.tndisability.org/brain @BrainLinksTN

Brain Links is supported by the Administration for Community Living (ACL) of the U.S. Department of Health and Human Services under Grant No. 90TBSG0051-01-00 and in part by the TN Department of Health, Traumatic Brain Injury Program.