The Intersection of Brain Injury and Substance Use Disorders

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Learning Objectives

Participants will be able to:

- Define brain injury and describe common causes
- Describe how non-fatal drug overdose causes brain injury
- Describe how brain injury might impact traditional treatment interventions

This project was funded by the Pa Department of Health's Title V Maternal Child Health Services Block Grant

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Acquired Brain Injury

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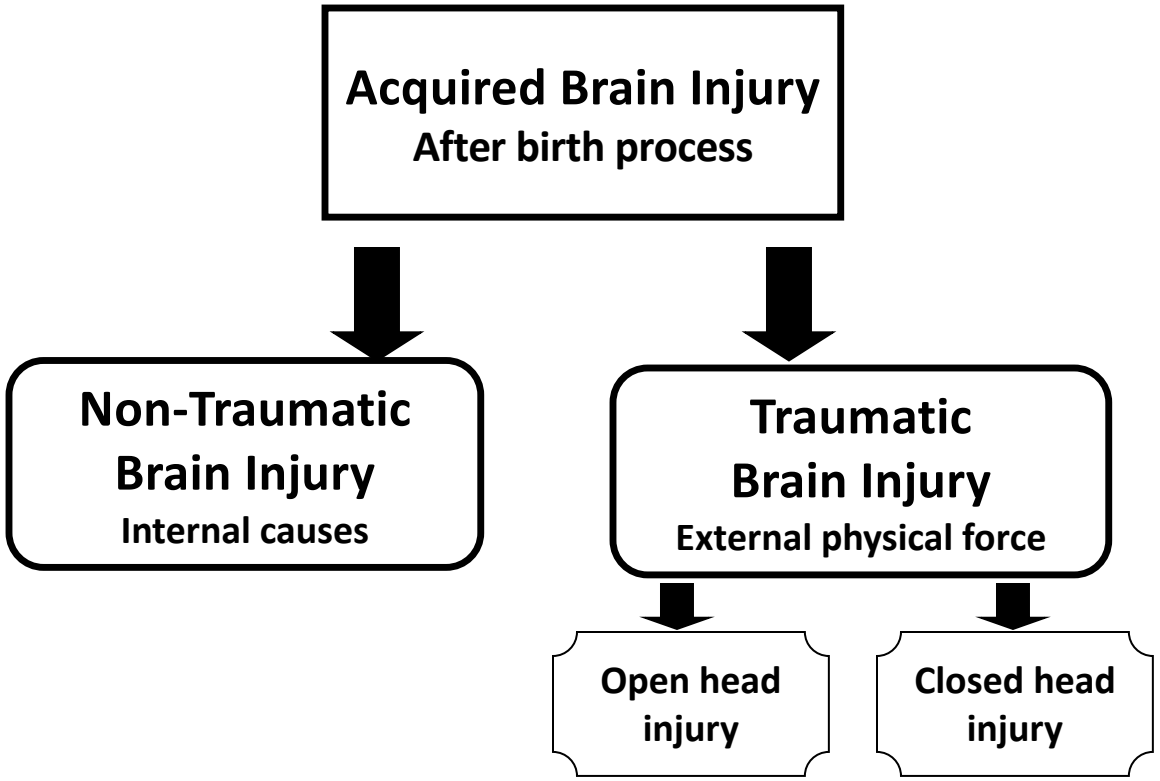
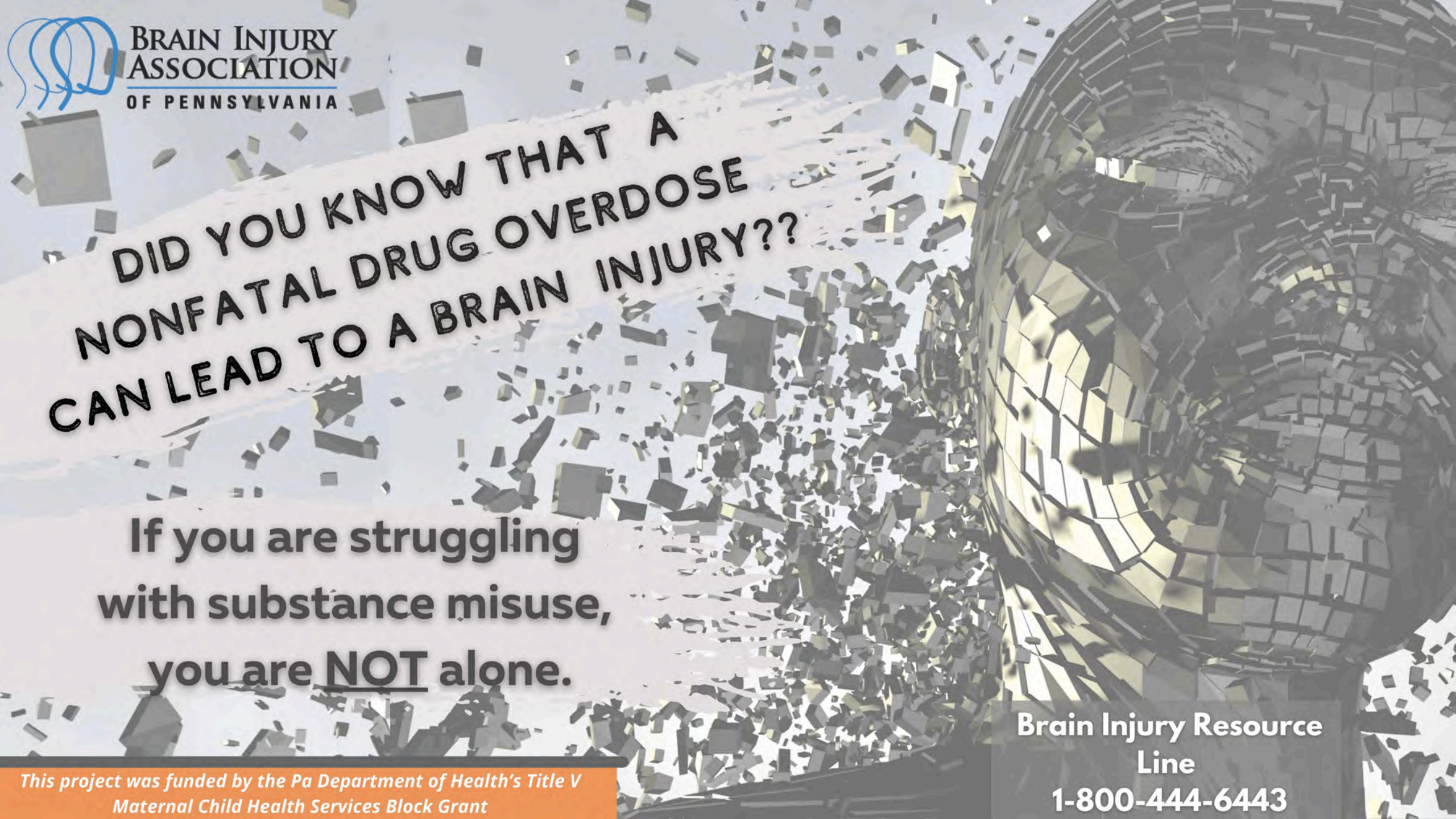
Types of Brain Injury



Non-Traumatic Brain Injury

– **An insult to the brain resulting from internal causes:**

- Anoxia/Hypoxia
- Infections of the Brain
  - Meningitis or Encephalitis
- Cerebral Vascular Accidents
  - Hemorrhaging
  - Aneurysms
- Ingestion of Toxic Substances
  - Inhalation of organic solvents
  - Ingestion of heavy metals
- Brain Tumors
  - Surgery, radiation, chemo



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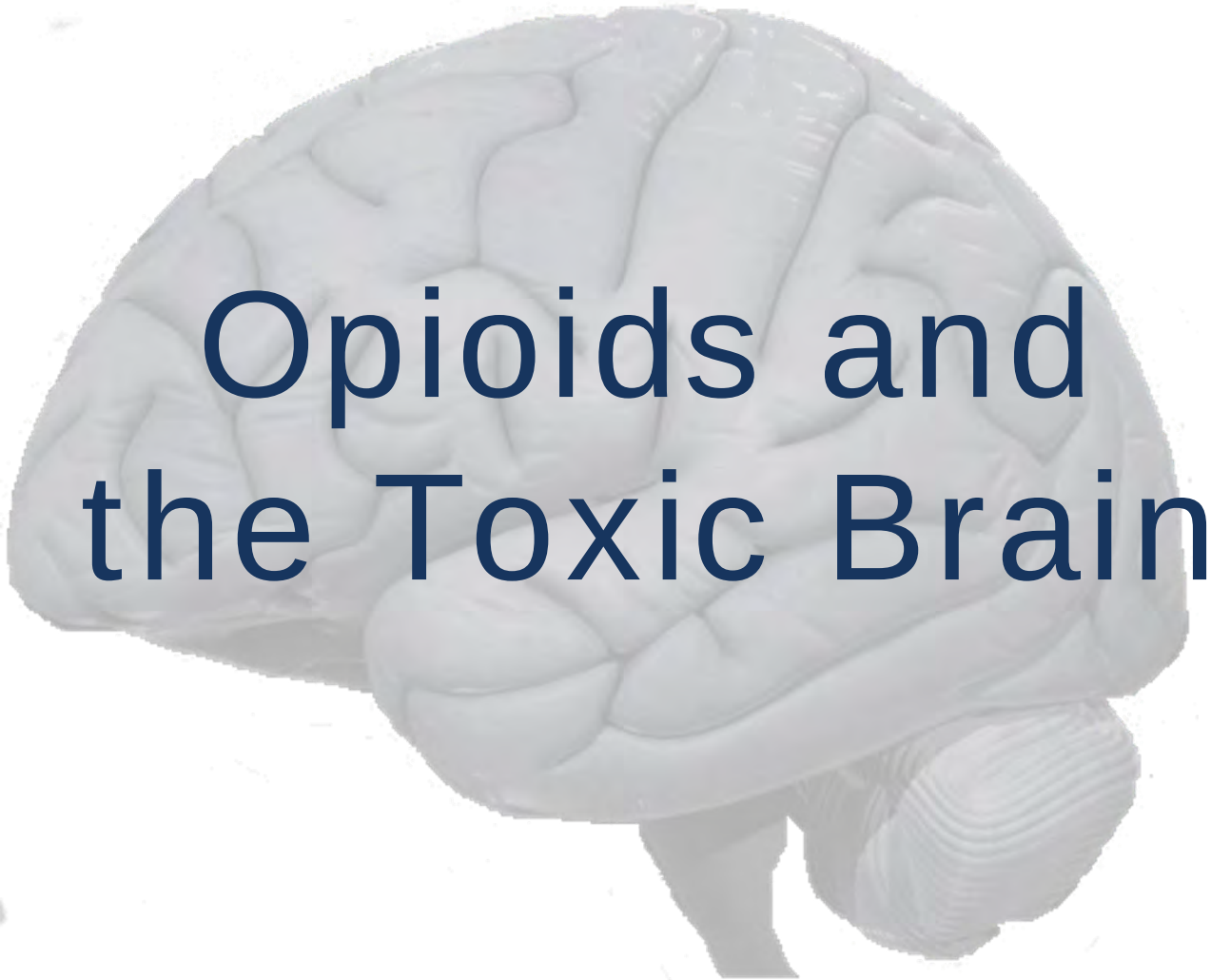
Opioid Induced Anoxic Brain Injury



Opioids and the Toxic Brain

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The Toxic Brain - A New Kind of Brain Injury

- Toxic Brain Injury - occurs from prolonged substance misuse and nonfatal overdose
  - Hypoxic Brain Injury - occurs when the brain does not receive enough oxygen
  - Anoxic Brain Injury occurs when the brain does not receive any oxygen

Overdose and Brain Injury

The Toxic Brain - A New Kind of Brain Injury

- Toxic brain damage is caused by:
  - disruption of nutrients needed by brain tissue
  - direct damage, injury, and death of brain cells, including neurotransmitter receptors
  - alterations to brain chemical concentrations, including neurotransmitters and hormones
  - deprivation of oxygen to brain tissue

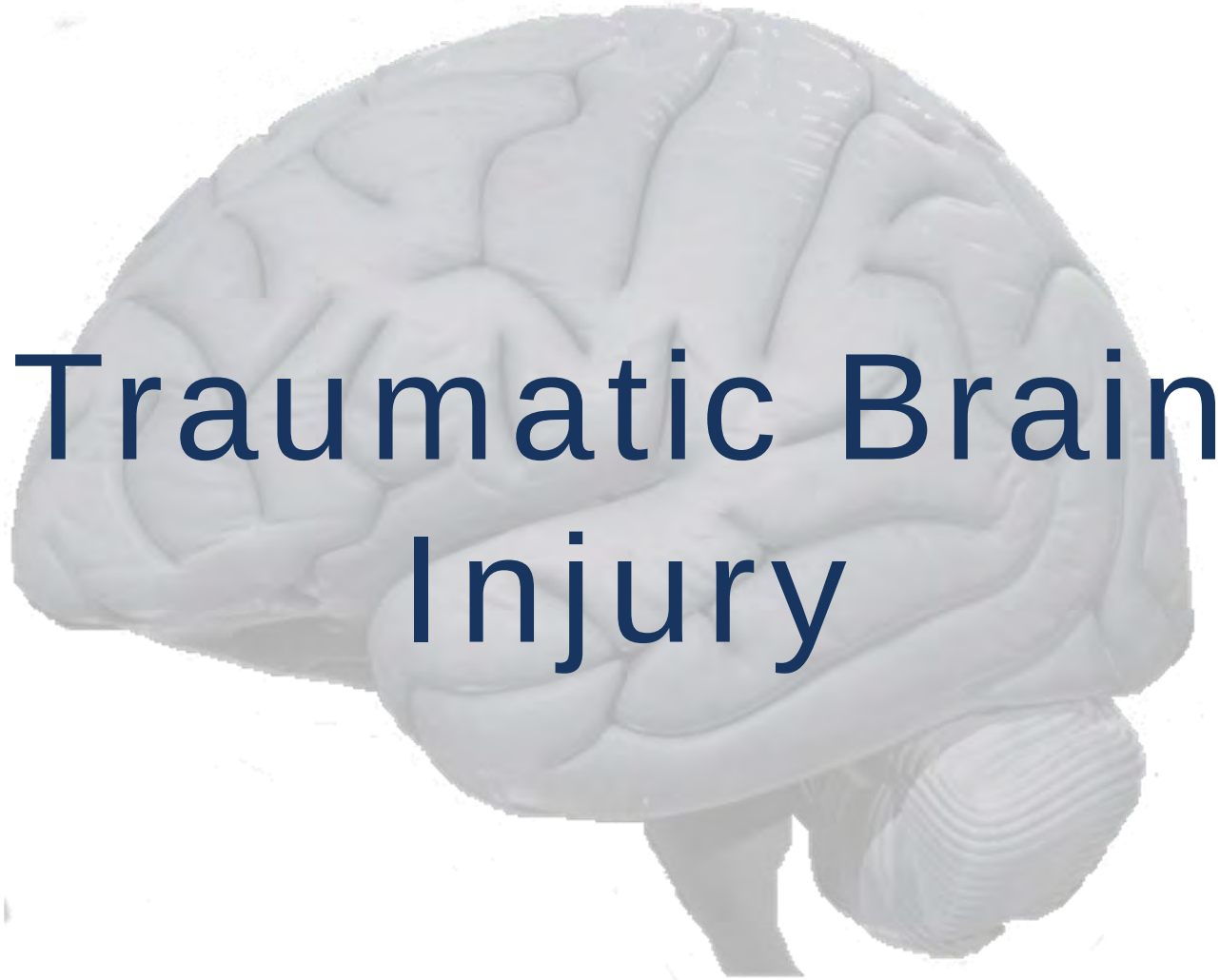
The Opioid Crisis and Relation to Acquired Brain Injury

- 67% of people in brain injury rehab have a history of substance abuse prior to their injury

- 20% of people who did not have substance abuse problems before their injury develop them after brain injury

- 50% of people in substance use disorder rehab have evidence of an acquired brain injury

- People who survive an opioid overdose may suffer an anoxic brain injury



Traumatic Brain Injury

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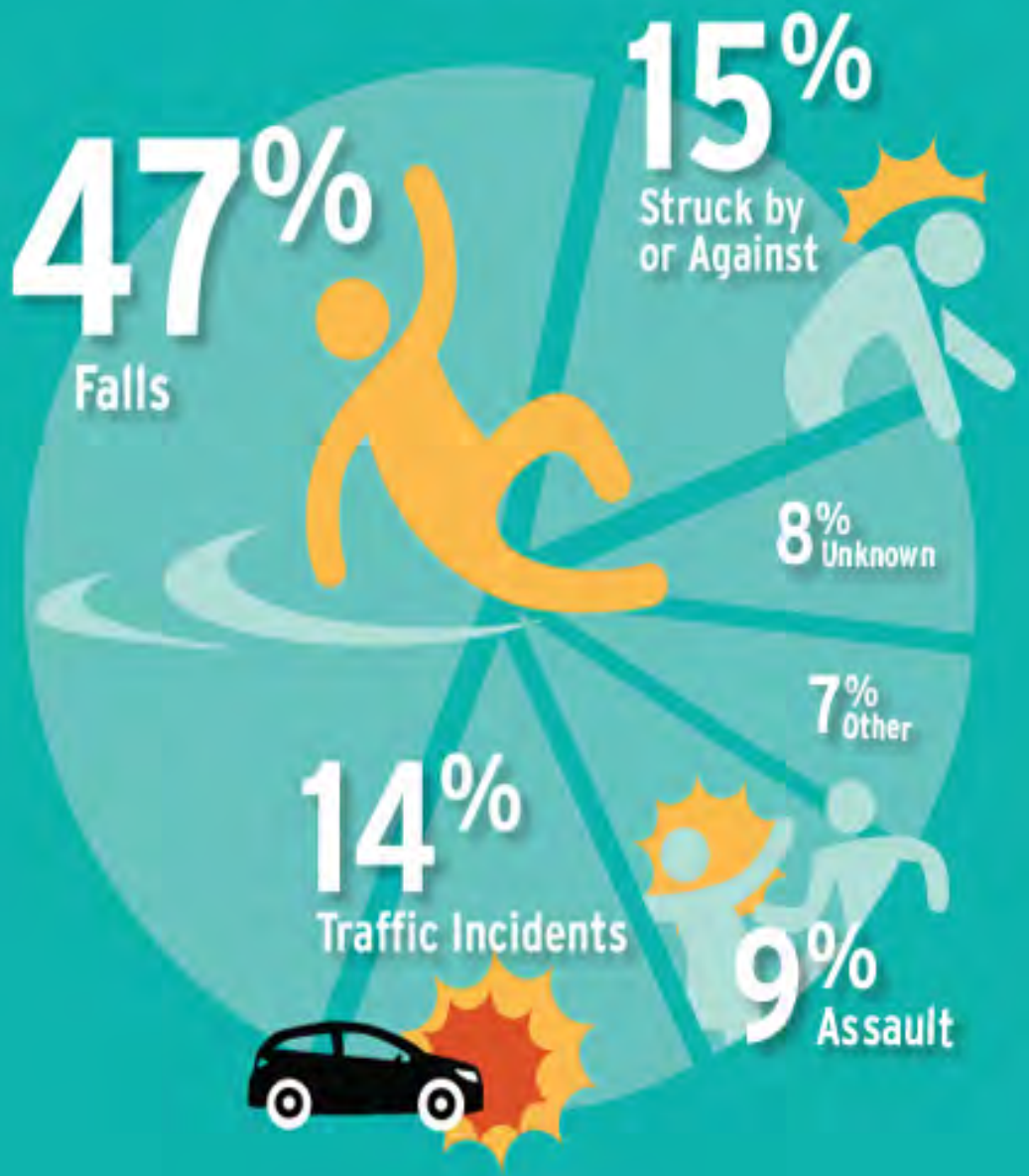
Leading Causes of Traumatic Brain Injury

in the United States (2013)



Traumatic Brain Injury

- An insult to the brain caused by external physical force
- Not all blows or jolts to the head result in a TBI
- Severity range
  - Mild with a brief change in mental status or consciousness
  - Severe with an extended period of unconsciousness or amnesia after injury

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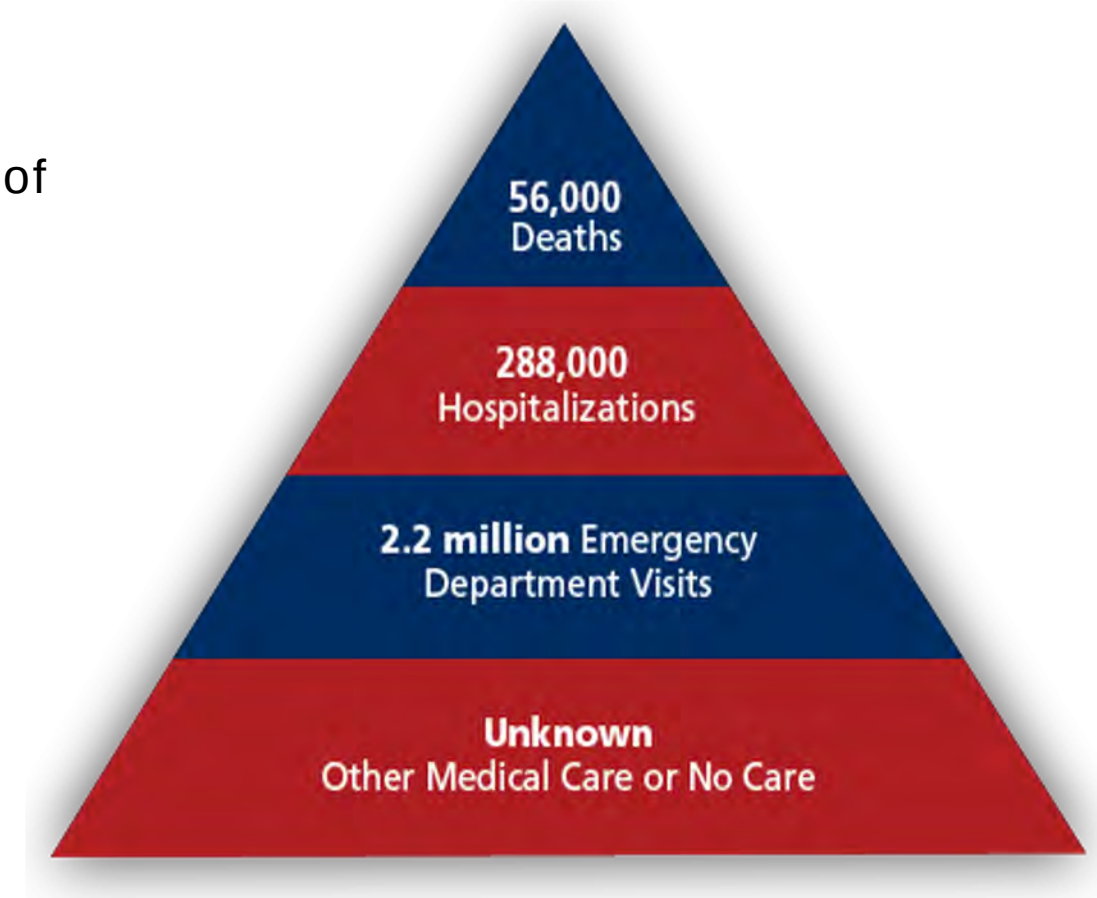
How Common is TBI?

- Brain injury as a disease/disability continues to grow - CDC
- TBI is under-identified in certain parts of the population,
  including children:
  - Children
  - Those living in poverty
  - People who are homeless
  - People with Mental Health and Substance Misuse diagnoses
  - Incarcerated populations



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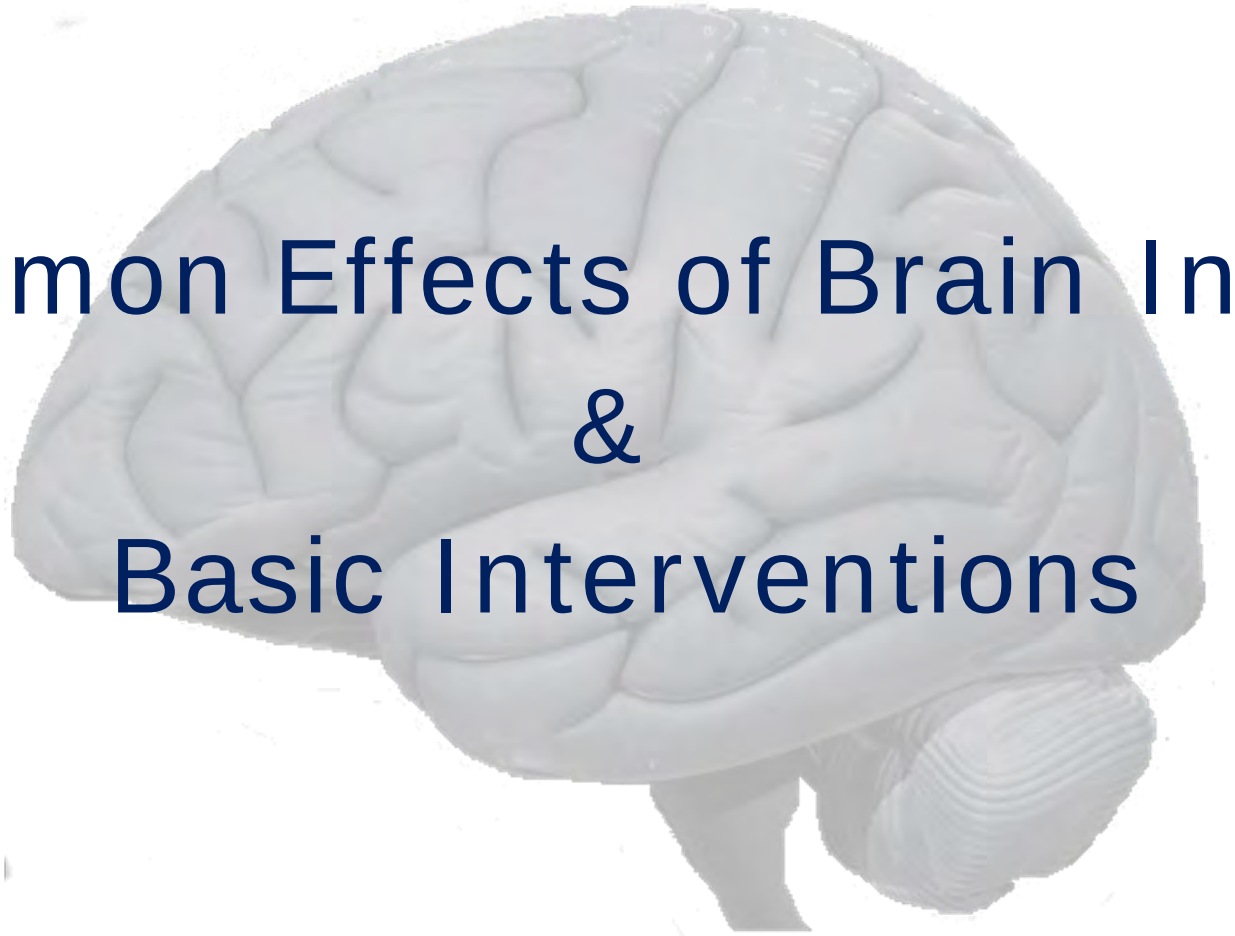
Brain injuries are often undiagnosed...

Common Effects of Brain Injury
&
Basic Interventions



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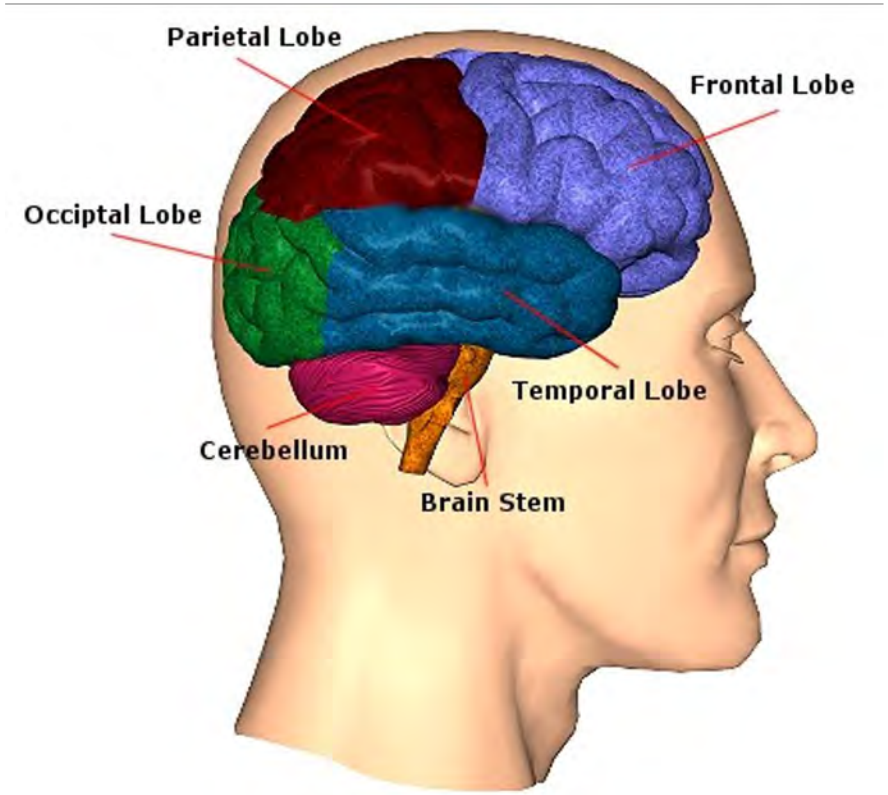
Brain Behavior Relationships

Parietal Lobe
- Sense of touch
- Differentiation: size, shape, color
- Spatial perception
- Visual perception

Occipital Lobe
- Vision

Cerebellum
- Balance
- Coordination
- Skilled motor activity



Brain Stem
- Breathing
- Heart rate
- Arousal/consciousness
- Sleep/wake functions
- Attention/concentration

Frontal Lobe
- Initiation
- Problem solving
- Judgment
- Inhibition of behavior
- Planning/anticipation
- Self-monitoring
- Motor planning
- Personality/emotions
- Awareness of abilities/limitations
- Mental flexibility
- Speaking (expressive language)

Temporal Lobe
- Memory
- Hearing
- Understanding language (receptive language)
- Organization and sequencing

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Possible Physical Changes

- Seizures
- Headaches and Pain
- Smell/Taste
- Motor Skills/Balance
- Spasticity/Tremors
- Swallowing/Speech
- Fatigue/Weakness

Cognition

The act of knowing or thinking, including the ability to choose, understand, remember, and use information

Includes:

- Attention and concentration
- Processing and understanding information
- Memory
- Communication
- Executive functioning

Improving Basic Brain Functioning

Arousal

“The energy of the mind is the essence of life”

Aristotle

Attention: Definition

"*the state in which cognitive resources are focused on certain aspects of the environment rather than on others and the central nervous system is in a state of readiness to respond to stimuli*"

Dictionary.APA.org

Types of Attention:

- focused
- sustained
- selecting
- alternating
- divided (most complex)

Attention: Strategies

- Minimize distractions
  - quiet room?
  - close the door
- Ask client to repeat information
- Schedule shorter sessions
- Speak in shorter sentences
- Check-in questions and reminder to “stay with me”

Attention: Related Constructs

Information Processing Speed: "*A measure of the efficiency of cognitive functioning*" Sweet, L.H., 2011

- think of it as "cognitive" reaction time

Strategies

- speak slowly and use short sentences
- allow the client time to respond
- write down important points or summarize at end of session

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Cognitive Fatigue

- Fatigue is one of the most common effects after TBI
- Cognitive fatigue comes from the extra effort it takes to think
  - Many common tasks take much more concentration than they did before
  - Working harder to think and stay focused can make people mentally tired
  - Can lead to headache and irritability

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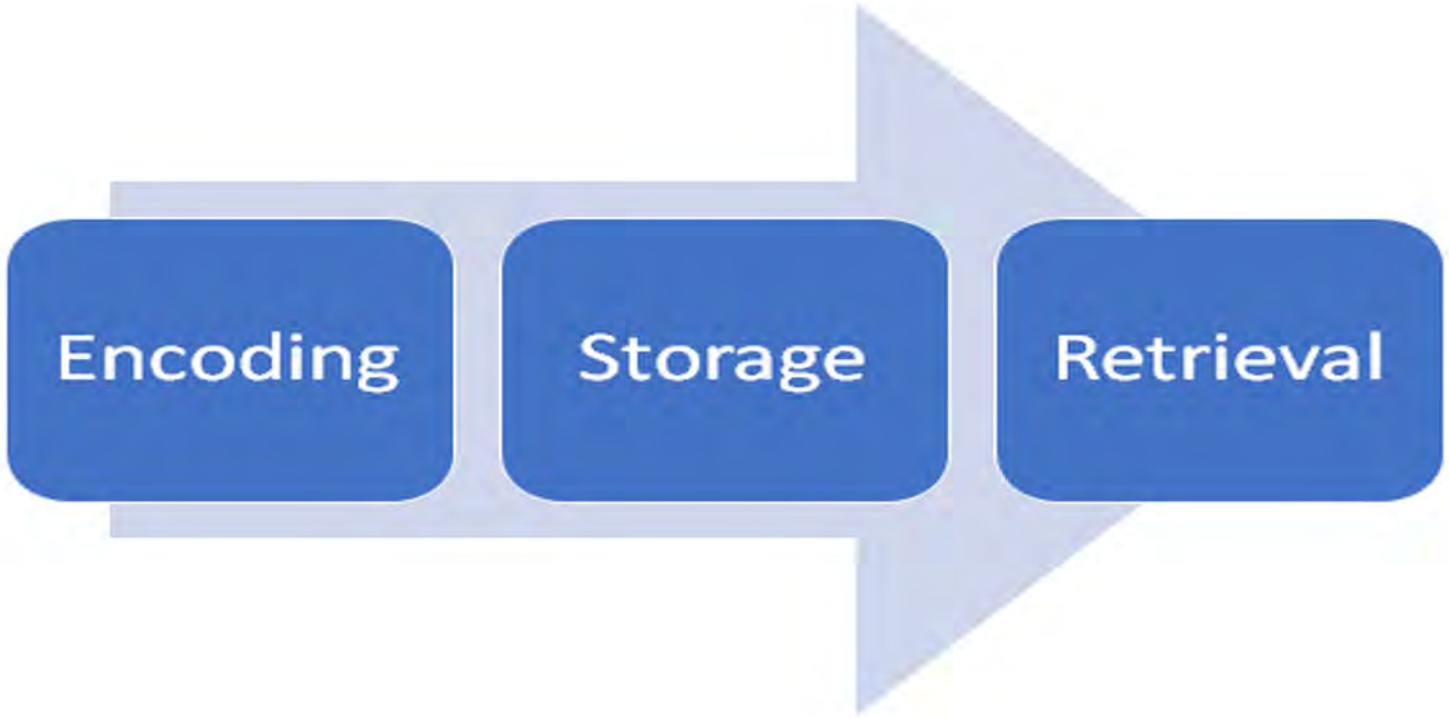
Speech and Language

- Expressive language impairments
  - Speaking and writing
- Receptive language impairments
  - Misunderstanding what is said or written
- Misinterpretation of non-verbal cues
  - Tone of voice
  - Body language

Language and Social Communication: Strategies

- Set expectations for behavior and review…frequently
- Provide feedback
  - Clear and immediate - but not punitive
  - Positive-Negative-Positive Sandwich
- Practice interactions using role-play
  - Videotape
- Formal social skills training
- Leave time at the end of the session to review and write notes about what needs to happen and be remembered

Memory: Definition



Memory

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Immediate and Delayed Memory

- Immediate Memory refers to recalling recently presented information without a time delay

- Delayed Memory refers to recalling previously learned information after a time delay

Prospective Memory

- Prospective memory is remembering to do something that you intend to do in the future, at the time that you intended to do it
- Most complex type of memory, in that it relies on:
  - delayed memory
  - monitoring of time passage
  - being able to keep track of memory and time passage at same time

Types of External Devices

- Notebooks
- Other written planning systems
- Electronic planners, PDA's
- Smart cell phones
- Computerized systems
- Auditory or visual systems
- Task-specific aids

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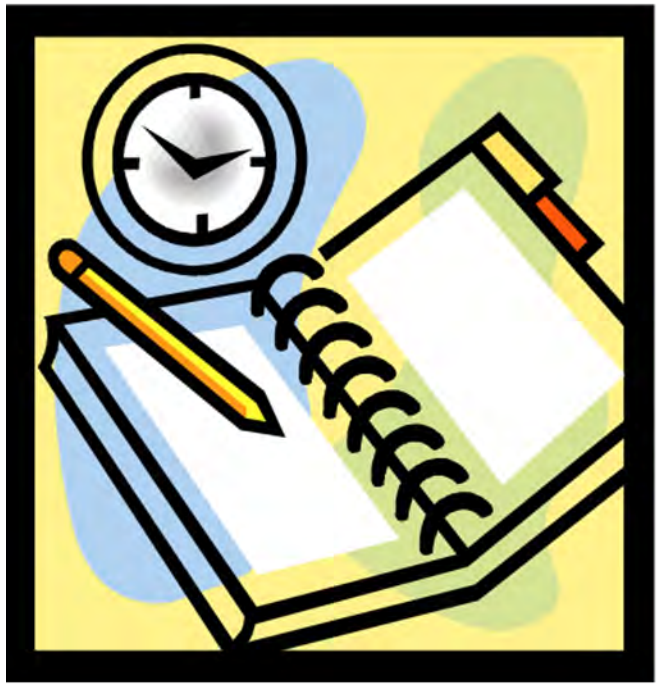
Memory Notebook

- Comprises the core of external memory compensations, along with electronic devices
- Possible sections:
  - Things to do
  - Memory log
  - Daily schedule
  - Homework
  - History and background
  - Handouts
  - Contacts



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Executive Functions

A higher order cognitive construct involved in planning, initiation, and regulation of goal-directed behavior

(Lezak, 1983; Luria, 1980)

Executive Functions include:

- Initiation
- Planning and organization
- Mental flexibility and problem-solving
- Inhibition
- Reasoning/judgment
- Self-monitoring or awareness

Frontal Lobe: Initiation and Intentional Behavior

Persons struggle with generating ideas about what should occur next and in implementing the plan via action

- Has trouble getting started
- Needs frequent prompts to complete a task
- Can identify a goal but cannot achieve it
- Appears passive or unmotivated
- May be thought of as depressed
- May be perceived as lazy

Frontal Lobe: Impulsivity and Disinhibition

The brain lacks ability to think ahead, anticipate consequences or automatically employ rules

- May say or do things without thinking
- May not know when to stop
- May not regard safety
- May not follow directions or rules
- May dominate conversations
- May be perceived as rude

Frontal Lobe: Planning and Organization

The brain has difficulty figuring out how things fit together and/or sequencing things.

- May be late for or miss appointments
- May have trouble remembering things to be done in the future

- May have messy rooms, backpacks, etc.
- May give up easily on complicated or multi-step tasks
- May communicate in a non-linear or circuitous way

Frontal Lobe: Mental Flexibility

The brain has difficulty shifting, seeing multiple options, or gets stuck easily

- May have difficulty thinking on the spot
- May get stuck on one idea or way of thinking
- May not be able to see another person's perspective
- Has difficulty adjusting to the unexpected
- Has difficulty solving problems
- May be perceived as stubborn, inflexible, selfish, unempathetic, and/or anti-social

Frontal Lobe: Self-Awareness and Insight

An individual may not easily recognize their abilities and limitations or accurately perceive how they are performing or coming across

- Denies or underestimates problems
- Sets unrealistic goals
- Unable to identify or alter inappropriate behaviors
- Blames others for their problems
- Anosognosia
- May be perceived as “not taking responsibility for one’s actions”

Frontal Lobe: Emotional and Behavioral Issues

- Lability
  - Lack of emotional control, unpredictable mood swings
- Alexithymia
  - Lack of awareness of emotions in self or others
- Irritability
- Disinhibition and Aggression
  - Behaves without regard for norms, without thinking
  - Can be anger-related or sexual
- Anxiety
- Depression

Brain injury problems can result in:

- Difficulties in living independently
- Disrupted relationships
- Substance abuse problems
- Mental health challenges
- Employment issues
- Financial hardship
- Justice involvement

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Brain Injury

Impact on
Treatment & Implications

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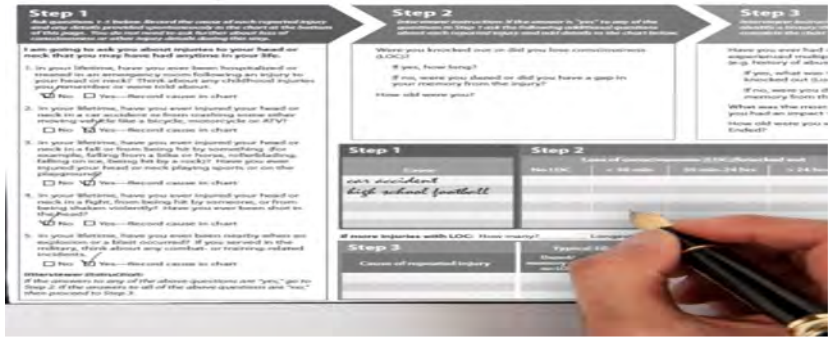
Questions and Implications for Providers:

- How might you identify substance misusers who have history of brain injury?
- How might you identify their cognitive difficulties?
- How will this information affect treatment recommendations and expectations?
- What resource connections can be made for these individuals and who can make them?

Determining History of Brain Injury: Screening

- Screening for lifelong history of brain injury
  - Traumatic Brain Injury Questionnaire (TBIQ)
  - Ohio State University TBI-Identification (OSU-TBI)
  - Brain Injury Screening Questionnaire (BISQ)

OSU TBI-Identification Method



- Can be administered by someone with basic interviewing skills and minimal training
- Takes approximately five minutes to administer
- Interpretable
- Useful in a wide variety of settings

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Opioid User
First Hand Account

Brain Injury Services and Supports

When you identify an individual who screens positive for a history of brain injury, you can refer them to the PA NeuroResource Facilitation Program (NRFP).

This is a program of the PA Department of Health.

https://www.health.pa.gov/topics/programs/Pages/NeuroResource-Facilitation-Program.aspx

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NeuroResource Facilitation Program

- The goal of the NeuroResource Facilitation (NRFP) program is to assist individuals with brain injury to identify and navigate local resources, services and supports.

- Enrolled individuals are assigned a NeuroResource Facilitator located in their region and will receive 20 hours of case management services, up to six months.

Supporting Persons with Brain Injury in Treatment

Lunch and Learn: Ask the Expert

Join us for our next Lunch and Learn on this topic. This is an interactive zoom meeting. Bring your questions!

Friday, May 17, 2024
12-1pm

https://us02web.zoom.us/j/85049553453

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For further information

www.biapa.org

www.health.pa.gov

Toll Free Brain Injury Resource Line

1-800-444-6443

PA Department of Health

1-717-772-2763