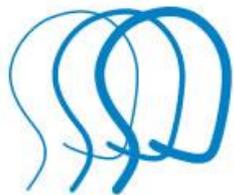


NeuroResource Facilitation for Youth with Brain Injury



Amy Flaherty, MA
Drew Nagele, PsyD, CBIST
Monica Vaccaro, MS, CBIS



**BRAIN INJURY
ASSOCIATION**
OF PENNSYLVANIA



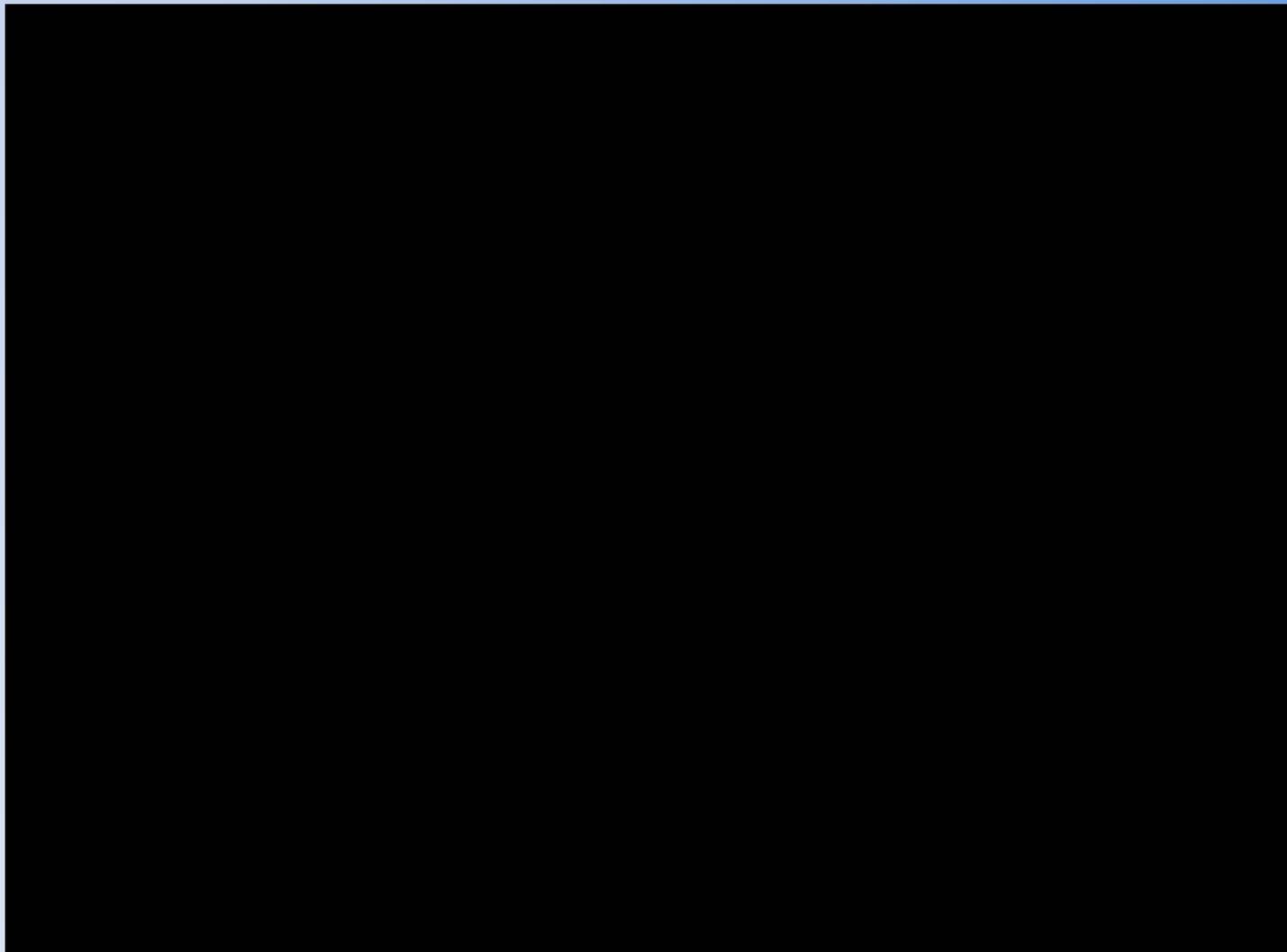
pennsylvania
DEPARTMENT OF HEALTH

What We Will Cover

- What is brain injury
- Types of brain injury
- Causes and prevalence
- Common effects of brain injury
- Impact on detained youth
- Brain injury screening
- NeuroResource Facilitation for brain injury



“Funded by TBI Implementation Grant #H21MC17232 from the U.S. Department of Health and Human Services Health Resources and Services Administration (HRSA). Contents are the responsibility of the authors and do not necessarily represent the official views of HRSA.”



Types of Brain Injury

Acquired Brain Injury
after birth process

**Non-Traumatic
Brain Injury**
Internal causes

**Traumatic Brain
Injury**
external physical force

**open head
injury**

**closed head
injury**

Acquired Brain Injury

- Any injury to the brain that occurs after birth as a result of:
 - Physical force (due to an accident)
 - Violent Acts (e.g., gun shot wound)
 - Tumors
 - Strokes
 - Infectious Diseases (e.g., encephalitis)
 - Anoxia (due to cardiac arrest, near-drowning, or strangulation)
- ABI is the broadest category and includes all brain injuries that occur after birth.

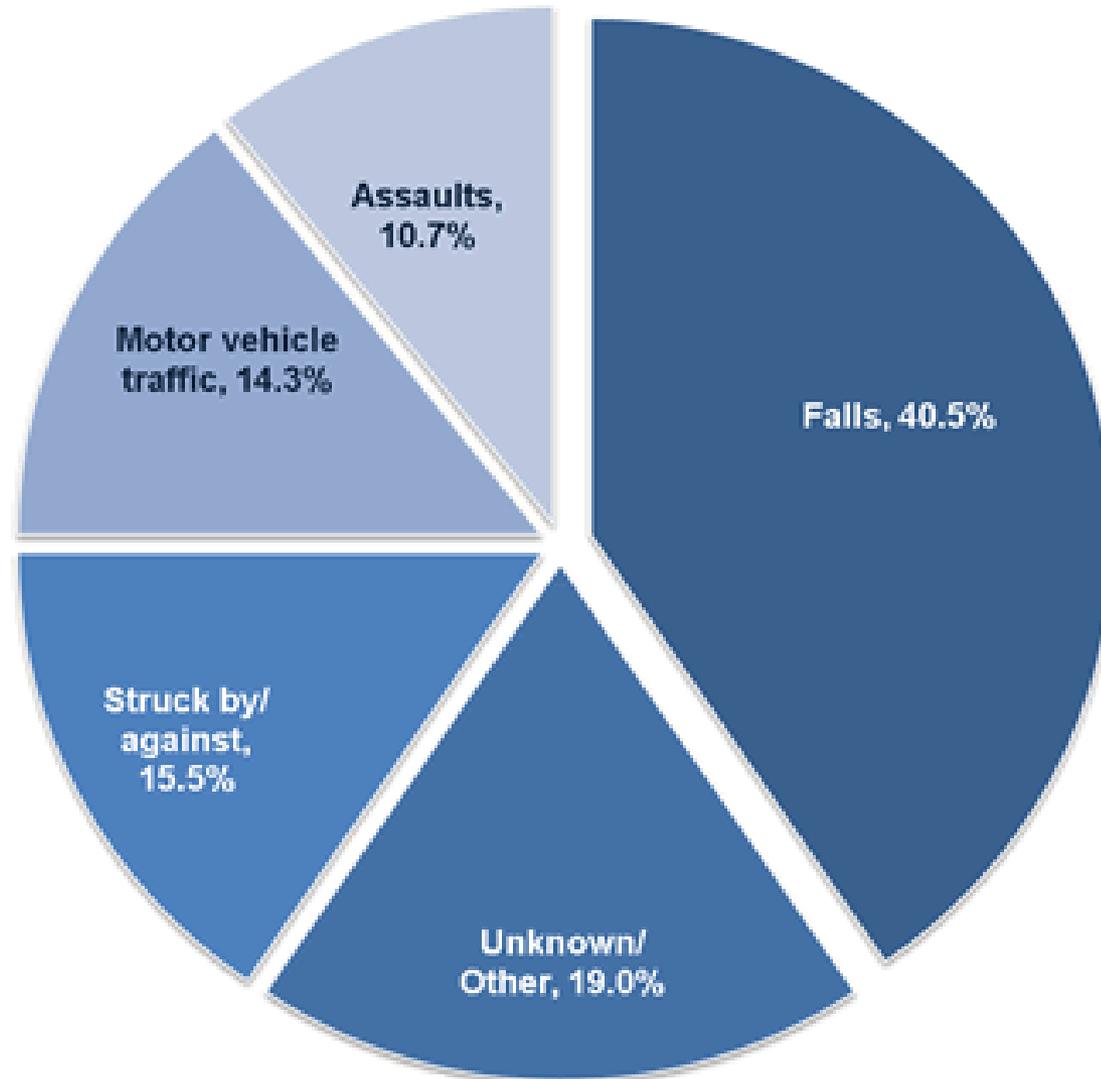


Acquired Brain Injury

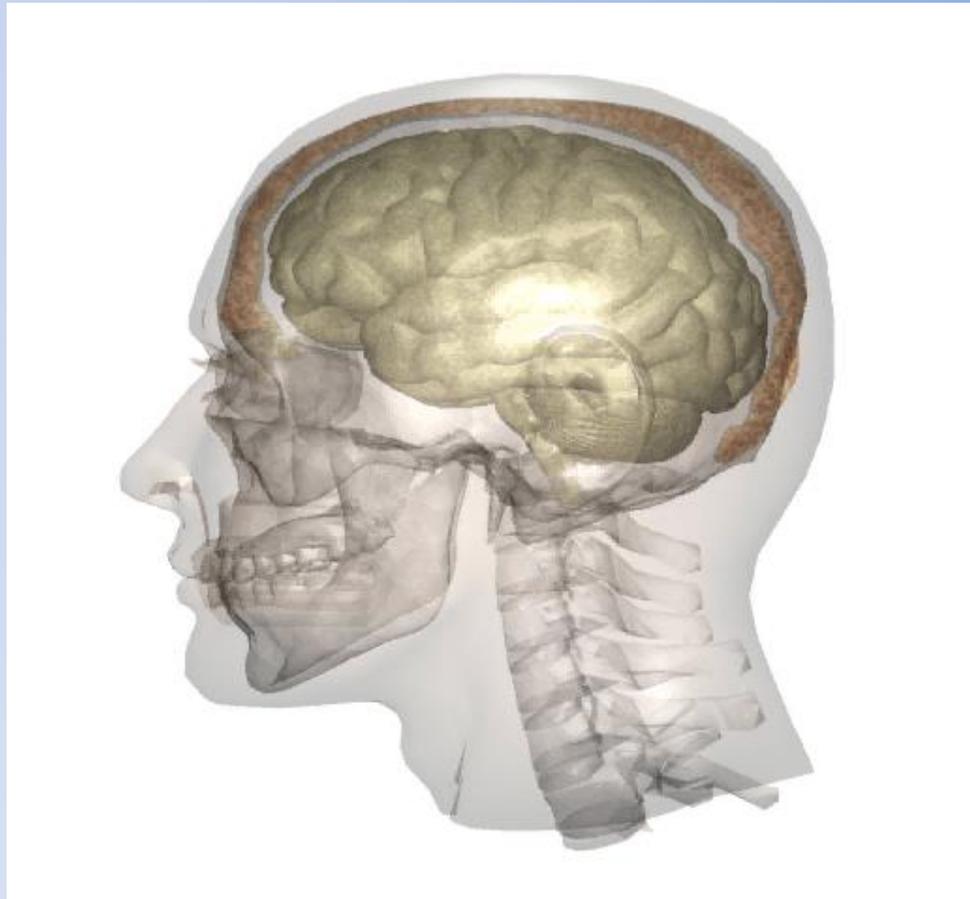
Traumatic Brain Injury – An insult to the brain caused by external physical force

- Not all blows or jolts to the head result in a TBI
- Severity range from
 - “mild” with a brief change in mental status or consciousness
 - “severe” with an extended period of unconsciousness or amnesia after the injury
- Youth with brain injury
 - Once you have initial brain injury, you are at risk for sustaining another
 - history of multiple TBIs is associated with dropping out of school, drug and alcohol abuse, delinquency

Leading Causes of TBI



What Happens During a Closed Head Injury?

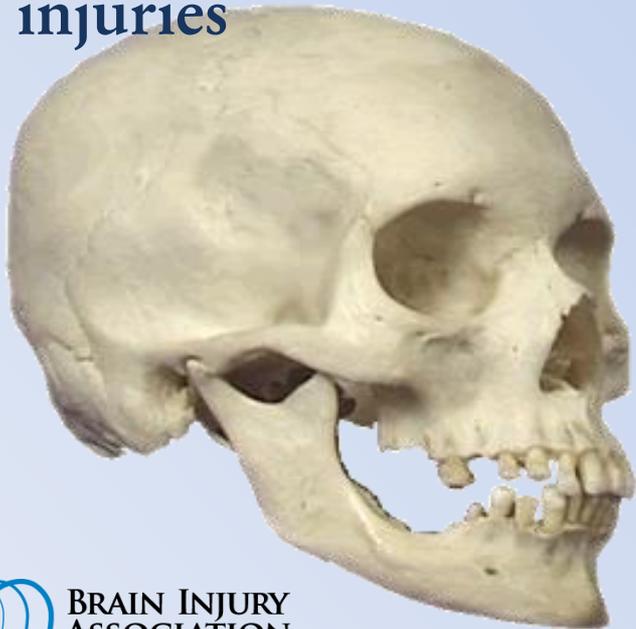


Centre for Neuro Skills

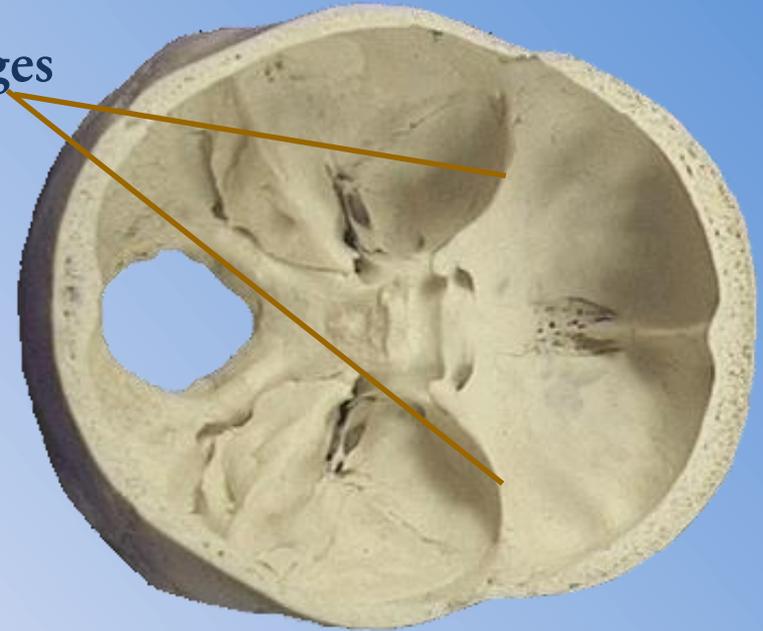
Skull Anatomy

Dr. Mary Pepping of the University of Idaho's presentation *The Human Brain: Anatomy, Functions, and Injury*

The skull is a rounded layer of bone designed to protect the brain from penetrating injuries



Bony Ridges



The base of the skull is rough, with many bony protuberances

These ridges can result in injury to the temporal and frontal lobes of the brain during rapid acceleration

Brain Hemorrhage



What Happens During an Open Head Injury?



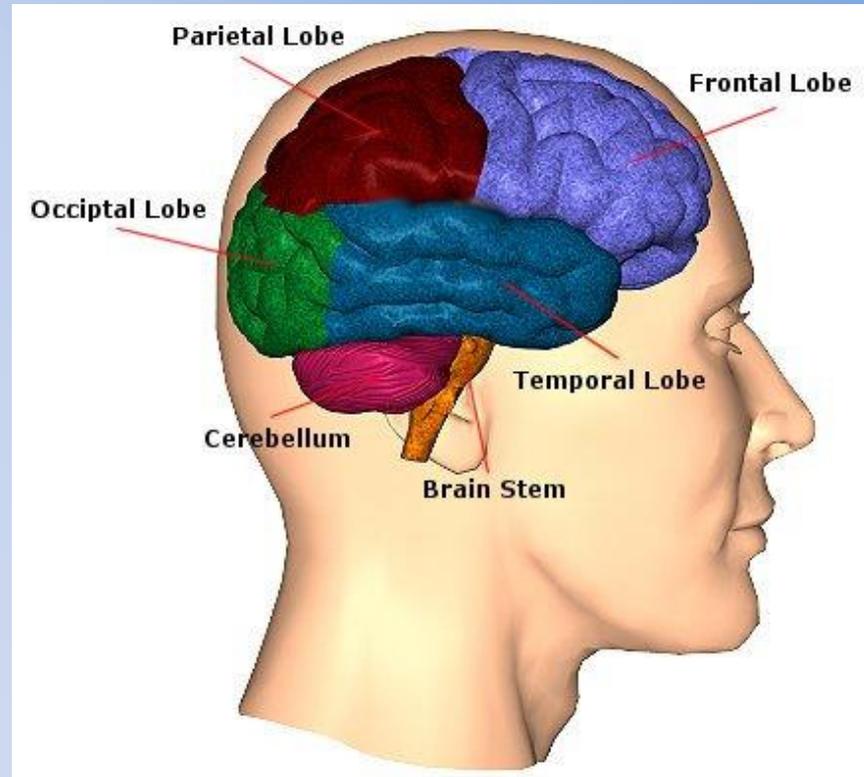
Brain Behavior Relationships

Frontal Lobe

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

Temporal Lobe

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



Parietal Lobe

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

Occipital Lobe

- Vision

Cerebellum

- Balance
- Coordination
- Skilled motor activity

Brain Stem

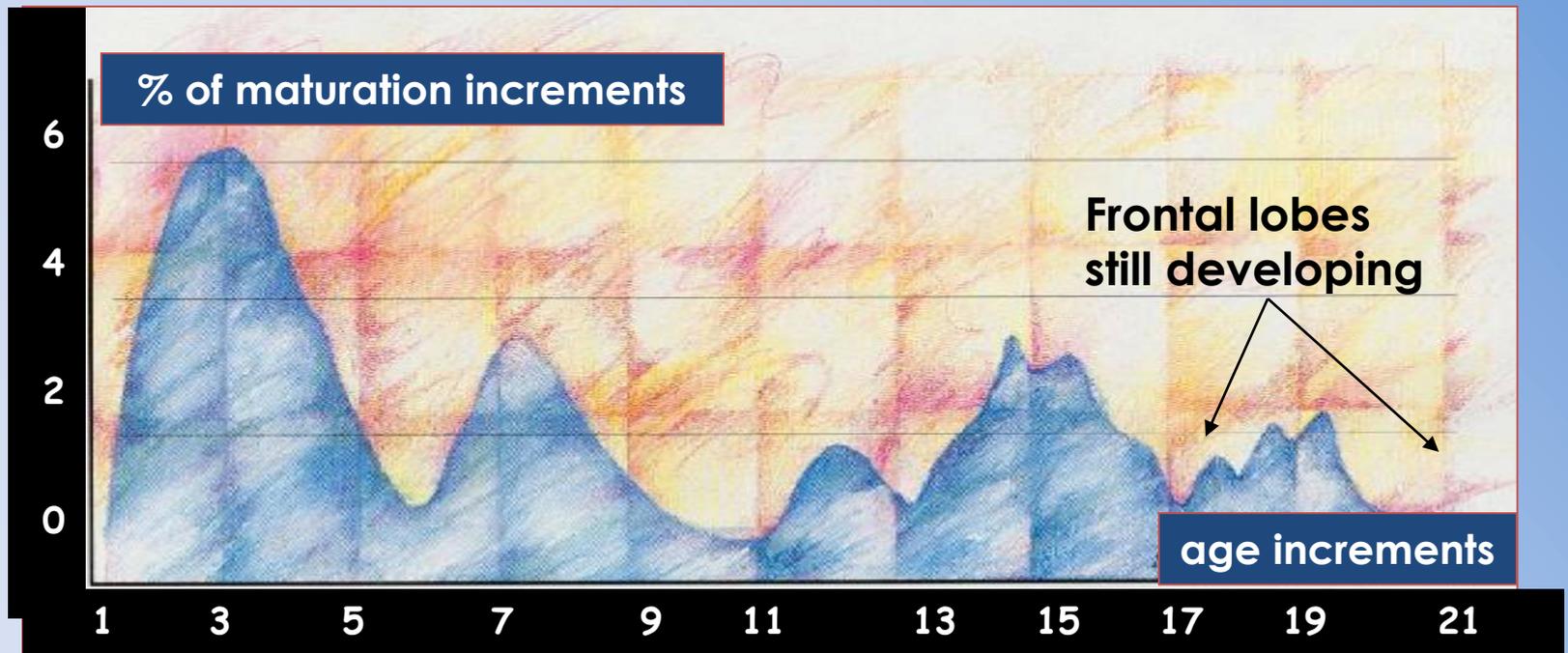
- Breathing
- Heart rate
- Arousal/consciousness
- Sleep/wake functions
- Attention/concentration

A Child's Brain



- **Underdeveloped**
 - the younger the child → less developed is their brain
- **Brain needs time & experience to mature**
- **Undifferentiated**
 - specialization develops in the brain as learning occurs
- **The earlier the injury → the more pervasive the impact**

Rates of Development: 5 Peak Maturation Periods



Peak Maturation Periods
FIVE distinct stages between the ages of 1 and 21 yrs.

Levels of Severity of TBI

Mild:

- Brief or no loss of consciousness
- Shows signs of concussion
 - vomiting
 - lethargy
 - dizziness
 - lack of recall of injury

Moderate:

- Coma < 24 hours duration
- Neurological signs of brain trauma
 - Skull fractures with contusion (tissue damage)
 - Hemorrhage (bleeding)
- Focal Findings on EEG or CT scan

Severe:

- Coma > 24 hours duration

What is a concussion?

- Traumatic Brain Injury (TBI)
- A blow to the head or body, a fall, or another injury that jars or shakes the brain inside the skull.
- Cannot “see” a concussion
 - Disruption to how the brain works on a cellular level
 - MRIs and CT Scans may show normal result even with a concussion
- Causes of a concussion
 - Hit, bump, blow, jolt to body transmitted to head
 - Even a “ding” or getting “your bell rung” can be a concussion

Signs and Symptoms of Concussion

 THINKING/ REMEMBERING	 PHYSICAL	 EMOTIONAL/ MOOD	 SLEEP DISTURBANCE
<ul style="list-style-type: none">• Difficulty thinking clearly• Feeling slowed down• Difficulty concentrating• Difficulty remembering new information	<ul style="list-style-type: none">• Headache• Nausea or vomiting (early on)• Balance problems• Dizziness• Fuzzy or blurry vision• Feeling tired, having no energy• Sensitivity to noise or light	<ul style="list-style-type: none">• Irritability• Sadness• More emotional• Nervousness or anxiety	<ul style="list-style-type: none">• Sleeping more than usual• Sleeping less than usual• Trouble falling asleep

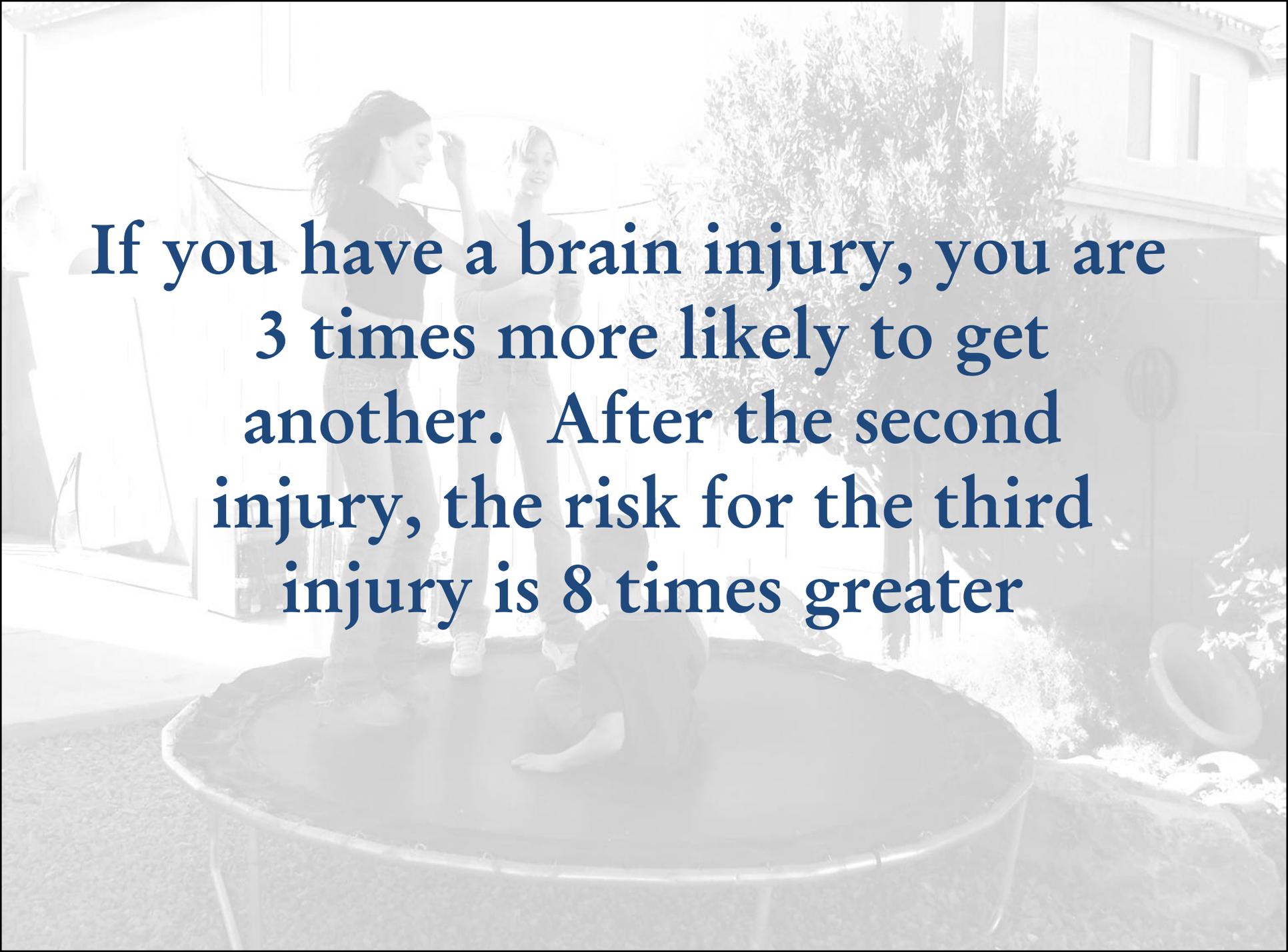
Brain Injury...

...can occur even if there is no loss of consciousness

...does not require a blow to the head

...does not always show on CT or MRI





**If you have a brain injury, you are
3 times more likely to get
another. After the second
injury, the risk for the third
injury is 8 times greater**

Brain Injury in Adult Corrections

- HRSA reports that 60% of inmates have had a history of brain injury prior to incarceration
- Williams, et. Al, 2010 report that repeated TBI resulted in an increased offending behavior
- McKinlay et. Al , 2013, looked at relationship between individuals who experienced a TBI during childhood, and Adult Offending Behavior
 - Found that individuals who experienced childhood TBI were more likely as adults to have an offending history
 - Relationship of TBI to offense was stronger the more severe the injury

Brain Injury in Juvenile Justice

Fatos, et. Al, 2013, report in a study of adolescents in the NY City Jails that 67.4% of screened detainees reported a history of at least one brain injury

- Most frequent causes were assaults (55.5%) followed by falls (41%)
- Inmates with brain injury were more likely users of mental health services
- Emotional dysregulation and impaired processing speed are likely linked to criminal justice involvement



Brain Injury in Juvenile Justice

- Perron and Howard, 2008, found from their study of delinquent youth that the lifetime prevalence of TBI will continue to climb as youth enter early and middle adulthood
- Youth with TBI display significantly more
 - Psychiatric distress
 - Earlier onset of criminal behavior
 - Earlier onset substance abuse behavior
 - More lifetime substance abuse and suicidality

What are the Long-term Consequences of Brain Injury?

- Short- or long-term problems and requiring help in performing activities of daily living
- A wide range of problems in thinking, sensation, memory, learning, language, behavior, emotions
- Mental health problems
 - severe depression
 - anxiety
 - difficulty controlling anger
 - alcohol or substance abuse
- Other Disorders
 - Epilepsy
 - Increased risk for both Alzheimer's and Parkinson's diseases
 - Other brain disorders associated with increasing age, Chronic Traumatic Encephalopathy (CTE)



Implications for those detained

Detained youth with brain injuries

- May be misdiagnosed as having mental illness
- More likely to have disciplinary problems during incarceration or poor adjustment to prison life or rules
- Tend to get kicked out of groups
- Fail at programs or parole



Challenge of interpreting behavior

- Effects of brain injury can appear to be lack of cooperation or disrespect
 - Failure to respond quickly to directives
 - Inability to initiate requests for assistance
 - Difficulty remembering prior discussions
 - Inconsistent attention
 - Difficulty following directions
 - Difficulty learning routines
 - Difficulty expressing needs
 - Impulsivity, emotional dyscontrol

How should the Problem of Brain Injury in the Criminal Justice System be addressed?

- A recent report from the Commission on Safety and Abuse in America's Prisons recommended:
 - increase health screenings and evaluations
 - treatment for inmates
 - development of partnerships with community health providers to assure continuity of care
 - case management for released inmates

Undiagnosed Brain Injuries

- Systems that have primary functions other than Brain Injury will not document Brain Injury
 - Unless medical documentation available
 - Brain Injury screening is in place
- Many brain injuries are undiagnosed
- A need for screening exists



Undiagnosed Brain Injuries

- Undiagnosed Brain Injury often referred to as the “hidden” disability
- Individuals may
 - Drop out of school
 - Start abusing substances
 - Fail at relationships
 - Become victims
 - End up in Mental Health System
 - Become homeless
 - Be unable to obtain or maintain a job
 - Results in incarceration in adult and juvenile justice systems



A young man, in his mid-twenties, hospitalized in a mental health unit, was admitted with the following complaint, “There is something wrong with my head and I can’t keep a job.” During a clinical interview, he revealed that his father had not been in his life for almost twenty years. His father had been physically abusive and he was subsequently hospitalized for broken bones. When he was school age, he was hit by a car, resulting in hospitalization for multiple injuries. He was placed in Special Education, as he had trouble learning and controlling his behavior in class. As an adolescent, he began using multiple drugs as well as alcohol. While still a teen, he was involved in another incident, resulting in hospitalization for several days. Thereafter, his ability to concentrate, remember, and control his temper became even worse.

After high school, he enlisted in the National Guard and served in Iraq for several months. He was injured in an attack, later describing this experience as ‘severe PTSD’. Once he was back in the states, he could not keep a job. His use of drugs and alcohol escalated and he was jailed for various offenses. He had nowhere to sleep except his car. A mental health crisis resulted in hospitalization. The clinician recognized the likelihood of traumatic brain injury (TBI). Neuropsychological testing revealed to the multidisciplinary treatment team problems with his multiple conditions.

This young man was indeed a case of “Unidentified TBI”. Once brain injury was identified as a contributing factor, he was linked to appropriate services and supports and was able to get supported employment and move along with his life.

NeuroResource Facilitation for Prison Inmates with Brain Injury to Improve Re-Entry



Byrne Justice Assistance Grant
Pennsylvania Commission on
Crime and Delinquency

NeuroResource Facilitation for Prison Inmates with Brain Injury to Improve Re-Entry

Project goals:

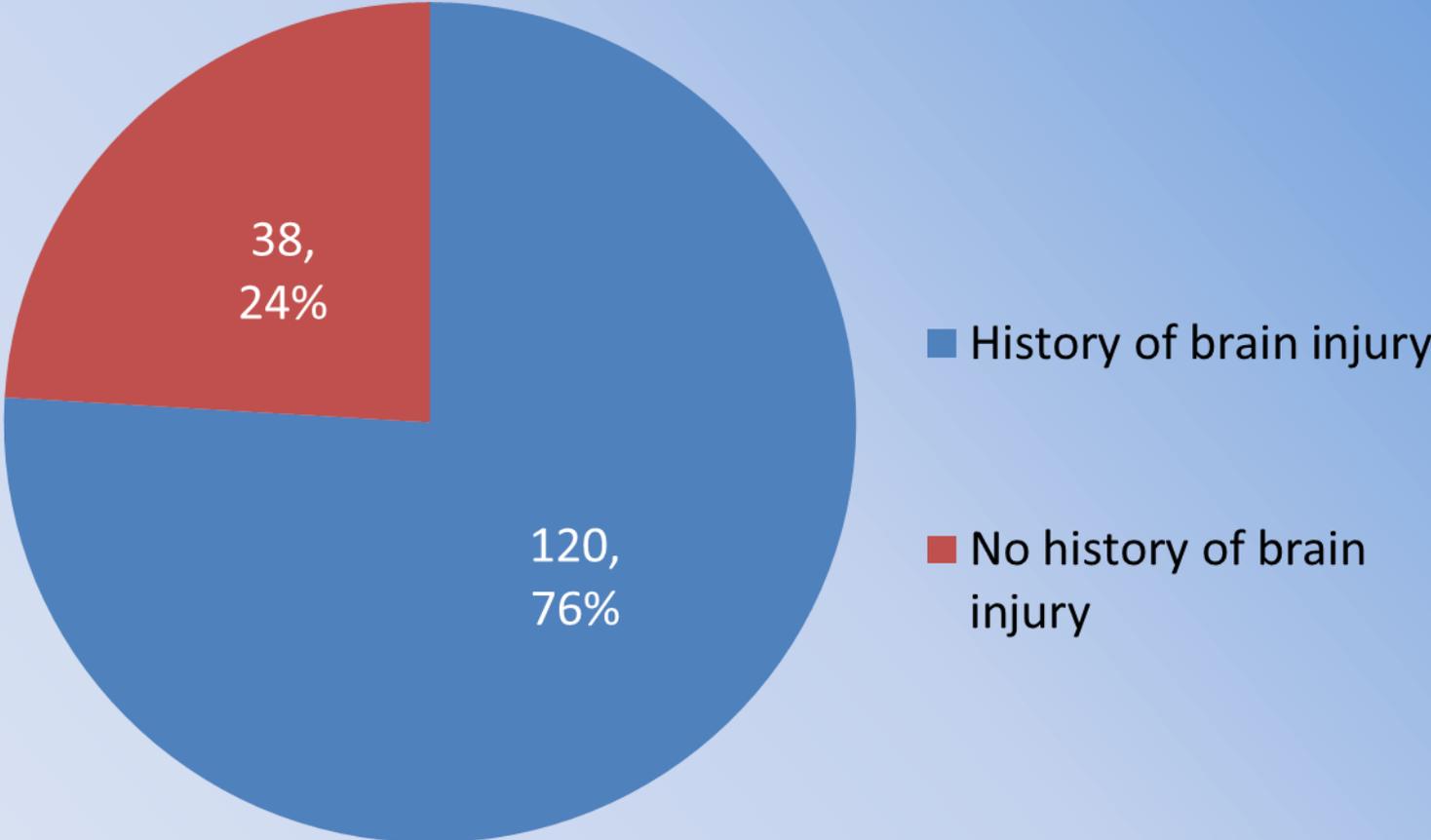
- Identify inmates who have brain injury
- Plan and develop services that will help them to be successful upon release from prison
- Coordinate with Re-Entry staff (DOC, Probation and Parole, OVR)
- Follow up post-release to ensure implementation of the plan



Parole and Probation

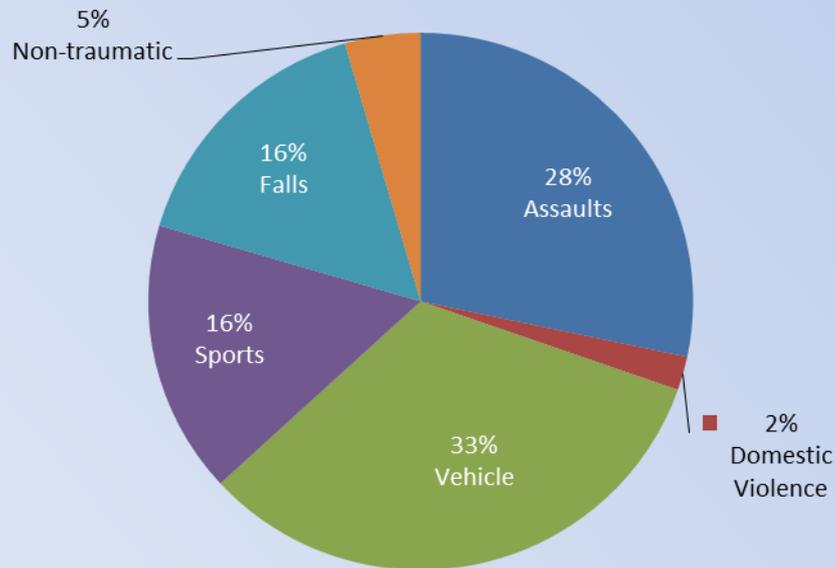
To ensure public safety, offender accountability and victims' rights through effective community corrections.

Screening Results

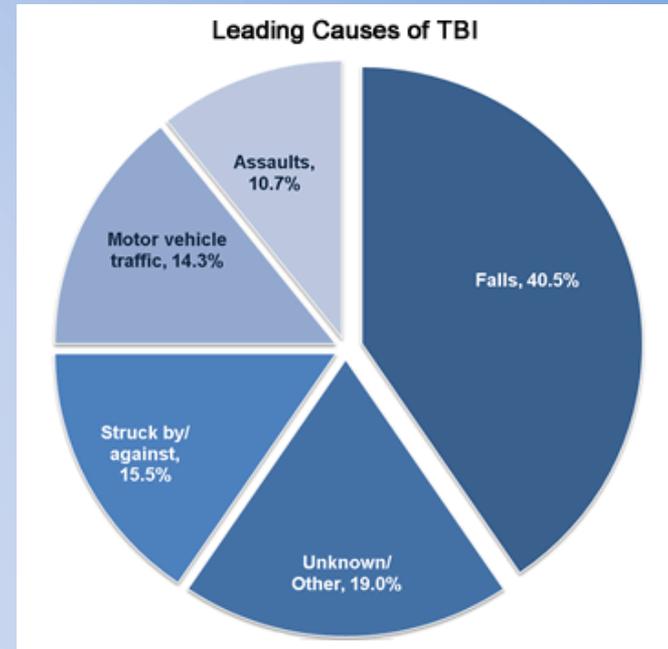


Causes of Brain Injury

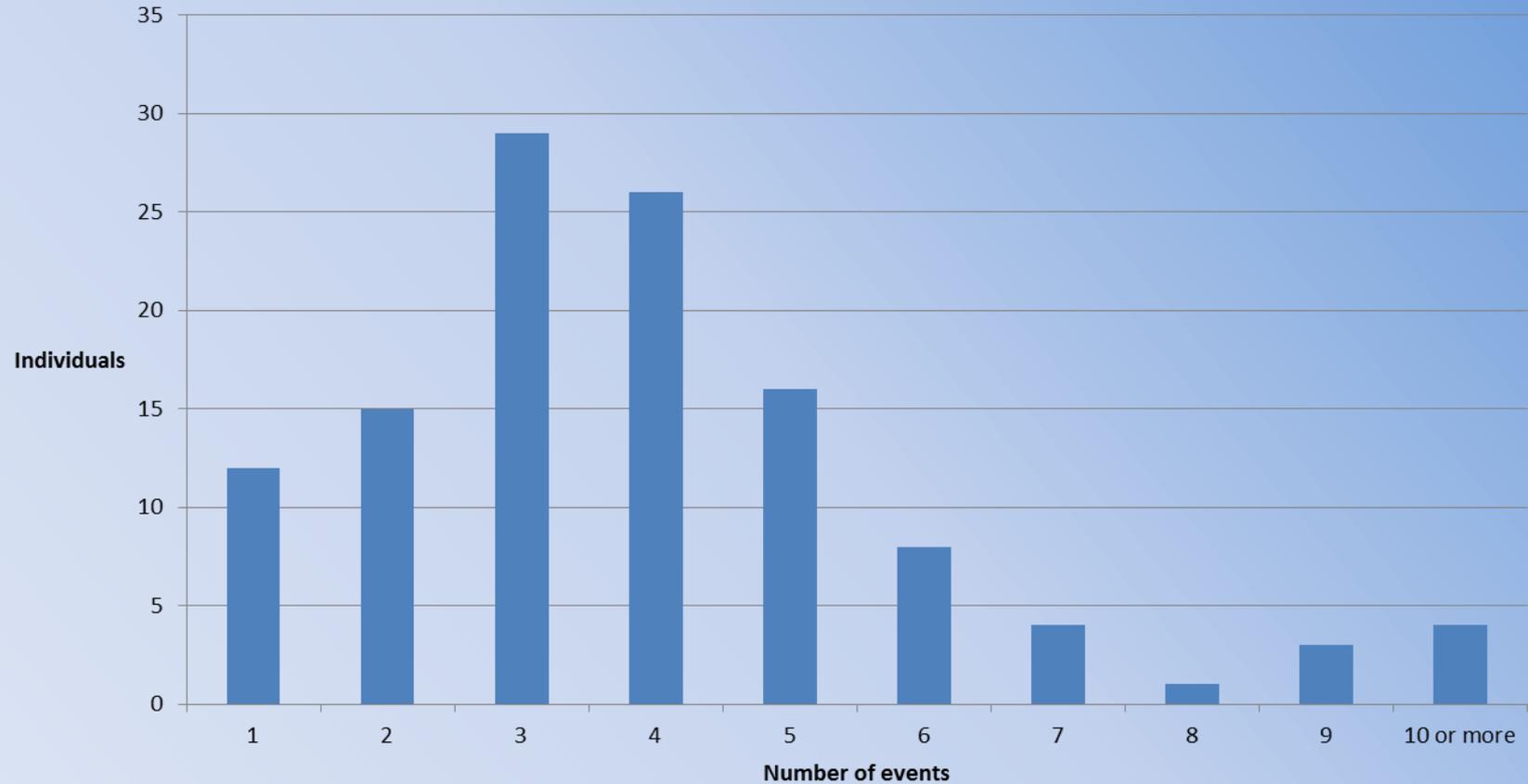
Inmate Population



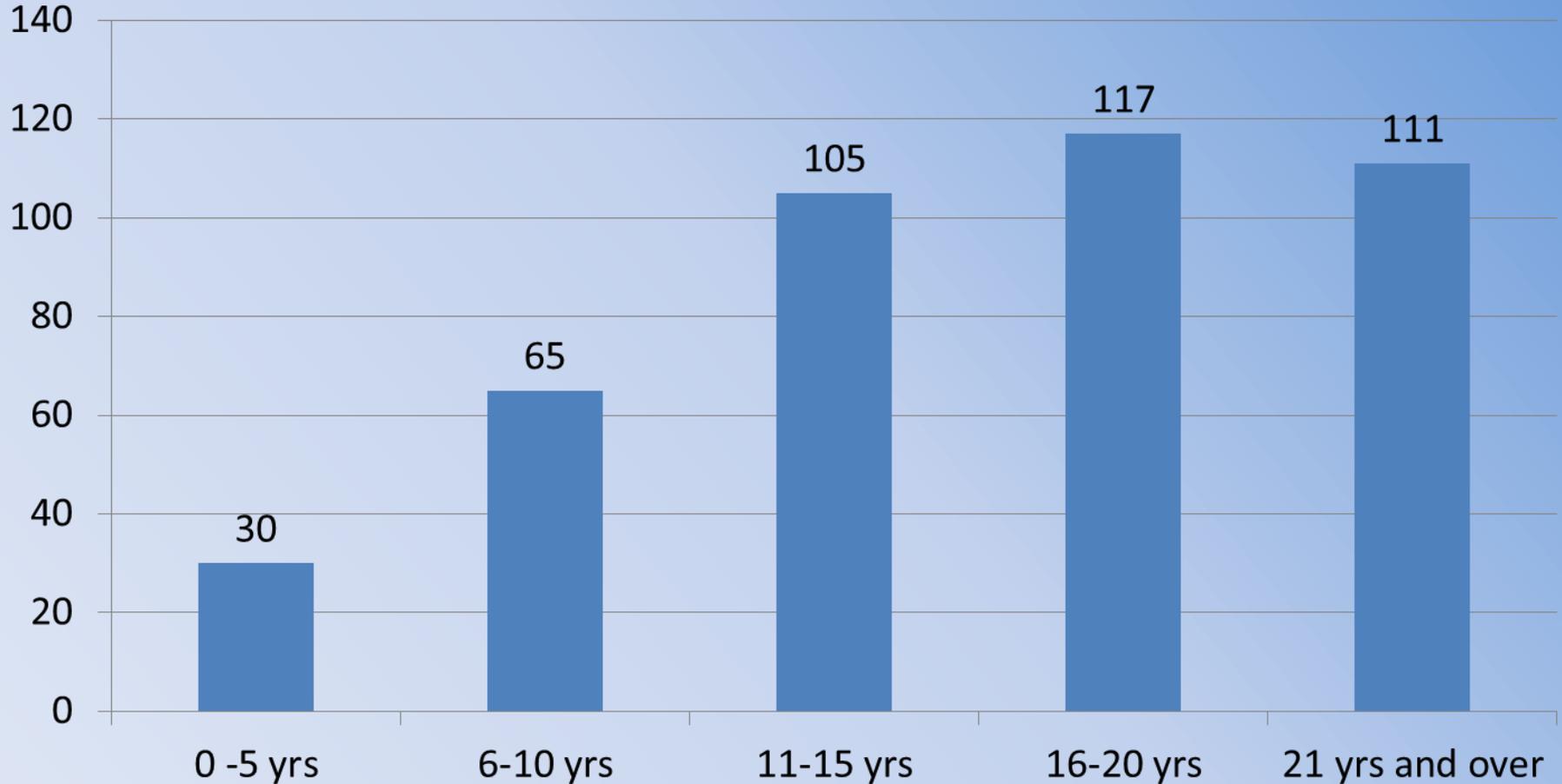
General Population



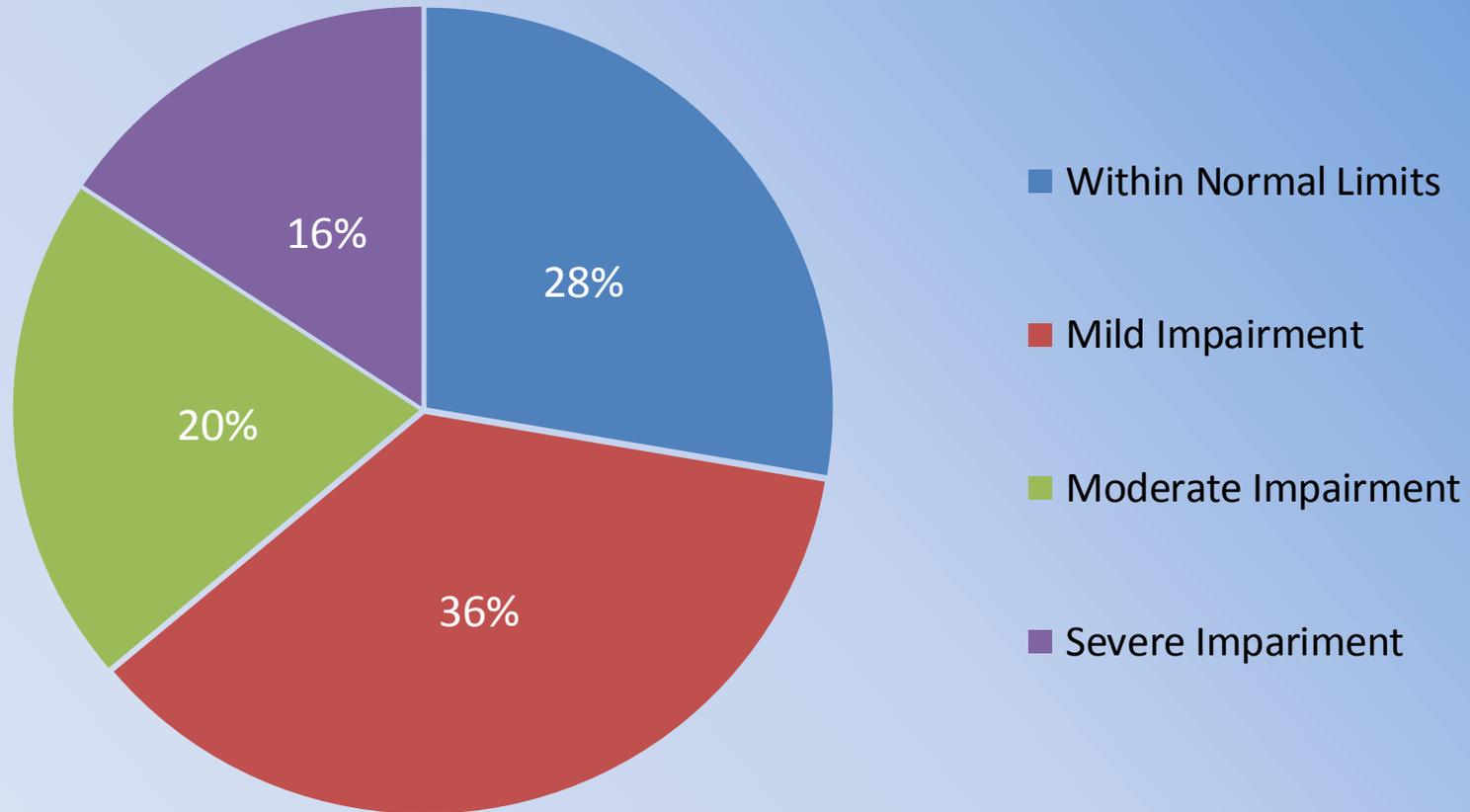
Number of episodes reported



Ages at which episodes occurred (n=428)



NeuroCognitive Impairment



Brain Injury Education, Training and Consultation Project:

Bucks County Youth Detention Center
Montgomery County Youth Detention Center

History of the Project

In 2014, the Health Resources and Services Administration provided a funding opportunity in the form of the TBI Implementation Partnership Grant Program

HRSA: Common Barriers to Access to Care

- lack of information regarding available services and supports
- a shortage of healthcare professionals who have training in TBI (specifically, an ability to identify TBI and treat the resulting symptoms)
- the absence of a TBI diagnosis or the assignment of an incorrect diagnosis
- TBI services spread across a variety of agencies resulting in services being difficult for families to find and/or navigate

As such, HRSA encourages States to develop or enhance comprehensive, multidisciplinary, easily accessible systems of care for individuals with TBI and their families

The system of care must have an emphasis on:

Diagnosis

Intervention

Resource Facilitation

Grant Activities

- Screening to identify individuals with TBI
- Building a trained TBI workforce
- Providing information about TBI to families and referrals to appropriate service providers
- Facilitating access to services through resource facilitation

The overarching goal of is to build a sustainable service delivery infrastructure for individuals with TBI and those at high risk for TBI

Populations at high risk for TBI

- Children 0 – 4 (African American children have the highest rate for this age group)
- Youth aged 15 -19 (African American youth have the highest rate for this age group)
- The elderly
- Athletes of all ages
- Homeless individuals of all ages
- Incarcerated individuals, including juvenile detainees
- Individuals harmed by domestic violence

Goals of the project

- Provide brain injury education, training and consultation to:
 - Detention Center Staff
 - Families
 - Schools
 - Probation Officers
 - Residential Treatment Facilities
 - Community Providers
 - Link to OVR

Goals of the Project

- Identify youth with brain injury through screening and neurocognitive testing
- Utilize information gleaned from neurocognitive evaluation activities to plan and guide the delivery of interventions that will best address the needs of students with cognitive impairments
- Provide NeuroResource Facilitation to make connections to brain injury resources in the community

Screening for history of brain injury

OSU-TBI-ID

- Semi-structured interview instrument
- Designed to screen for acquired brain injury
- Administered by a trained staff person who is familiar with TBI and has training in basic interviewing techniques
- Supplemented with questions about education history and performance as well as symptoms

Step 1: Event History Questions

#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.

If Yes, Record cause (s)

Step 1: Event History Questions

#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?

If Yes, Record cause(s)

Step 1: Event History Questions

#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?

If Yes, record cause(s)

Step 1: Event History Questions

#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?

If Yes, Record cause(s)

Step 1: Event History Questions

#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.

If Yes, Record cause(s)

Step 2: Loss of Consciousness

For each event recorded in Step 1:

Were you knocked out or did you lose consciousness.

- 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: Multiple or Repeated Injuries

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

- ask questions about LOC or dazing
- What was the most severe effect from one of the times you had an impact to your head?
- How old were you when these repeated injuries?

OSU – Other CNS Involvement

- Questions about non-traumatic conditions that could cause brain injury
 - Epilepsy or seizure disorder
 - Oxygen deprivation (anoxia)
 - Brain infections such as meningitis, encephalitis
 - Stroke
 - Exposure to toxic chemicals

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

- **WORST** — there has been one moderate or severe TBI (i.e., any TBI with 30 minutes or more loss of consciousness)
- **FIRST** — TBI with any 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 even if apparently without effect
- **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 has been impaired.

NeuroCognitive Testing

- Administered to individuals who screen positive for an event that could have caused a brain injury
- Goal is to determine whether there are impairments associated with the events that are likely to interfere with success in the community



NeuroRehabilitation Services that can help

Post Acute Rehabilitation Services

- Outpatient including PT, OT, SP, NeuroPsych, Psychiatry
- Community Re-Entry Services including Return to School, Return to Work, Return to Life
- Community Residential Programs
- Structured Day Programs, including Clubhouse, Vocational
- Supported Employment Programs, including Job Development, Job Placement, Job Coaching
- Cognitive Rehabilitation

Facilitate applications for brain injury resources to be able to get actual rehabilitation services

NeuroResource Facilitation

- Provide education on brain injury to adolescent and family/support system
- Make connections to resources:
 - Medical Rehabilitation/Community Re-Entry Programs
 - School Re-entry Supports – BrainSTEPS in PA
 - Vocational Rehabilitation Services for supported employment
 - Community Colleges
 - Work-oriented technical and training programs

Screening Results (n=86)

- 47 screened Positive for a history of an event that could have caused a brain injury (55%)
- 39 screened Negative for a history of an event that could have caused a brain injury (45%)
- 66% of parents also supplied screening data

Case example: Juvenile

- 20 year old youth
- 2 significant events on screening
- Severe neurocognitive impairment on testing
- Released to residential treatment facility
- Unlikely to be able to manage the demands of everyday life in the community without supports
- Unable to connect with family

Case example: Juvenile

- 17 year old youth
- History of multiple mild brain injuries
- Car crash just before admission, resulting in LOC and 2-day hospitalization
- Acute symptoms (problems with memory, attention, balance, vision, sleep, fatigue, headaches)
- Too soon for neurocognitive testing
- Recommendations for accommodations
- Referrals for medical rehabilitation, school supports and vocational services upon release

For Further Information:



www.biapa.org

Toll Free Brain Injury Resource Line
1-800-444-6443