Brain Injury In Juvenile Justice:

Implications for Pediatric Rehabilitation

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IPRC
International Pediatric Rehabilitation Collaborative

What We Will Cover

- Research about brain injury in the criminal justice system
- Impact of brain injury on youth in juvenile justice systems
- Screening, assessment, and strategies for prevention in at-risk populations
- NeuroResource Facilitation

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Objectives

At the end of the session, each participant will:

- Understand recent literature about the prevalence of brain injury in corrections populations
- Discuss the impact of acquired brain injury on youth in the Juvenile Justice System
- Describe a method for identifying youth with brain injury through screening and assessment
- Implement strategies for family education and prevention of poor decision making in at-risk populations
- Define and explain the process of NeuroResource Facilitation for this population.

Brain Injury in Justice-Involved Populations

- What do we know from prior research?
- What are the implications for those who are justice-involved?
- How might this issue be addressed?

Brain Injury in Adult Corrections

- **60% of inmates have a history of brain injury prior to incarceration** (Shiroma, et al., 2010)
- **Criminal behavior appears to increase after TBI** (Farrer & Hedges, 2011; Brooks et al., 1986; Fazel et al., 2011; McIsaac et al., 2016; Timonen et al., 2002)
- **Repeated TBI resulted in an increased offending behavior** (Williams, et al. 2010)
- **Individuals who experienced childhood TBI were more likely as adults to have an offending history** (McKinlay et al., 2013)
- **Relationship of TBI to offense was stronger the more severe the injury** (McKinlay et al., 2013; Raine et al., 2005)

TBI Among Justice Involved Youth

- Prevalence has been estimated between 12 and 82% (McKinlay & Albicini, 2016)
- Rate of TBI is 3 to 8 times higher among juvenile offenders (Hughes et al., 2015)
- Half of youth offenders have a history of loss of consciousness, with repeat injuries being very common

  (Davies et al., 2012; Kaba et al., 2014)

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- 67.4% of adolescents in the NY City Jails reported a history of at least one brain injury (Kaba et al., 2013)
- 50% of males and 49% of females reported moderate to severe injuries
- Most frequent causes were assaults (55.5%) followed by falls (41%)
- Youth with brain injury were more likely to use mental health services

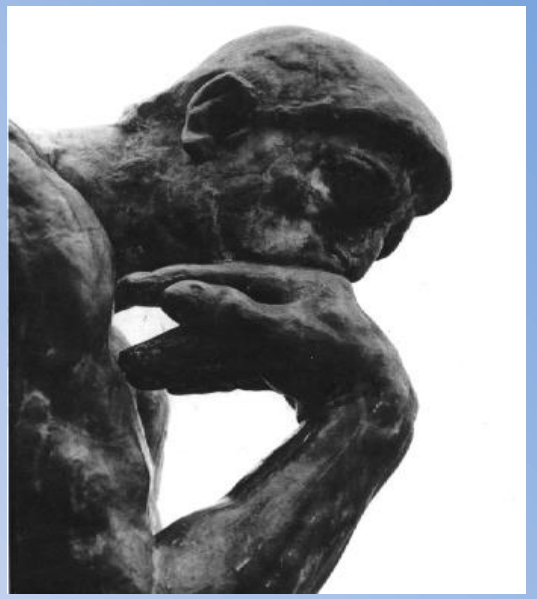
TBI Among Justice Involved Youth

- **Youth with ADHD are at greater risk of TBI**
  (Keenan, Hall, & Marshall, 2008)
- **Youth with TBI display:**
  - Significantly more psychiatric distress
  - Earlier onset of criminal behavior
  - Earlier onset substance abuse behavior
  - More lifetime substance abuse and suicidality
- **Lifetime prevalence of TBI will continue to climb as youth enter early and middle adulthood**

(Perron & Howard, 2008; Walker et al, 2003)

Characteristics Associated with Brain Injury that put Youth at Risk for Justice Involvement

- Decreased cognitive skills
- Poor impulse control, emotional dysregulation
- Decreased academic engagement
- Susceptibility to negative peer influence
- Poor insight
- Limited ability to self-monitor or self evaluate



Interpretation of Behavior in Criminal Justice Settings

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

Many brain injuries in justice involved youth are undiagnosed…

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Undiagnosed Brain Injuries

- Systems that have primary functions other than brain injury do not document brain injury
  - Unless medical documentation is available or brain injury screening is in place
- Many brain injuries are unreported and/or undiagnosed
- A need for screening exists

Undiagnosed Brain Injuries

- **Brain Injury is often referred to as the "hidden" disability**
- **Individuals may**
  - Drop out of school
  - Start misusing substances
  - Fail at relationships
  - Become victims
  - Become homeless
  - End up in Mental Health System
  - Be unable to obtain or maintain employment
  - Get into trouble with the law

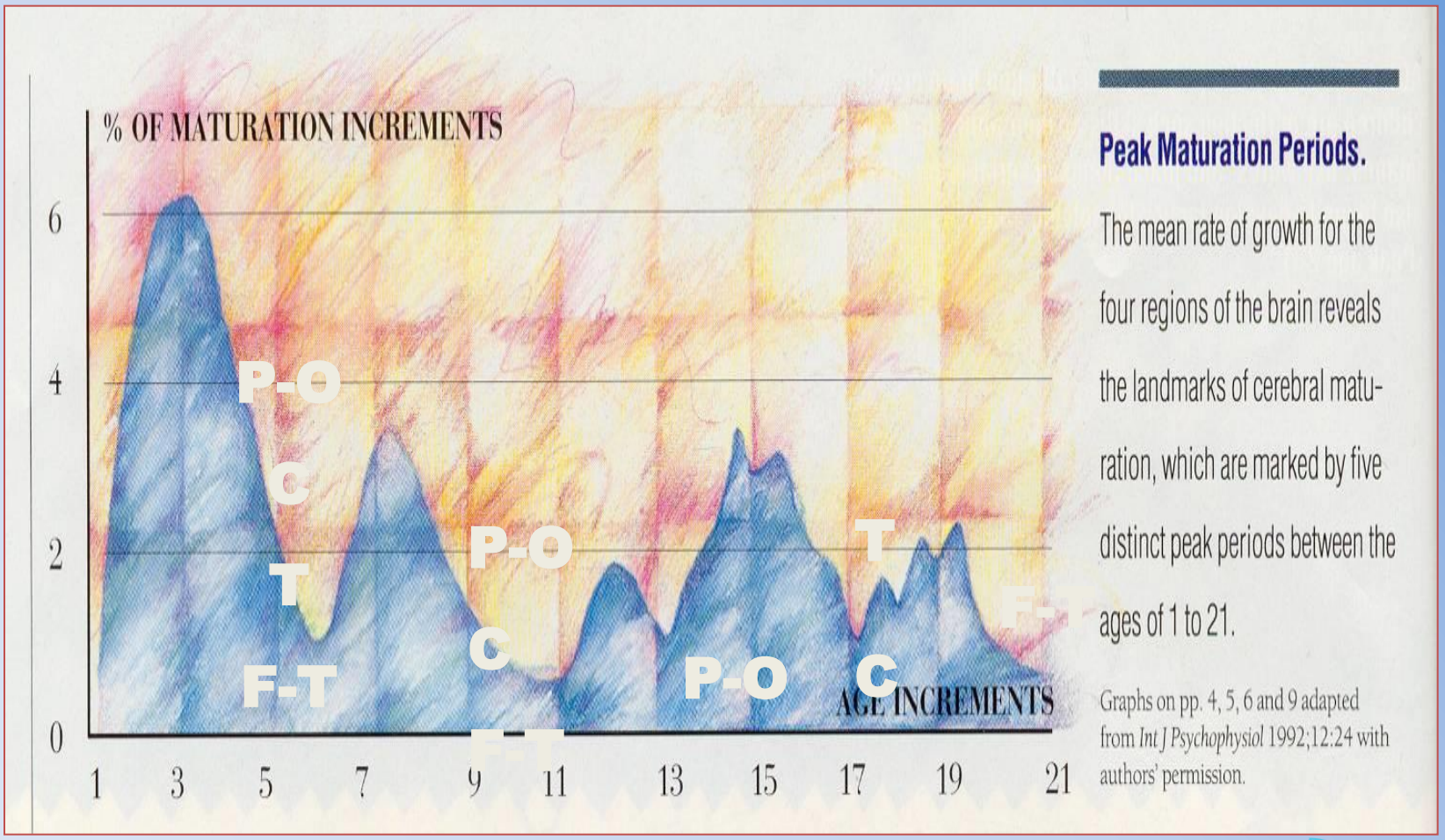
Why do youth with brain injury need a different approach?

- Executive dysfunction
- Emotional dysregulation
- Memory impairment
  - Variability of memory
  - Prospective memory

These are neuropsychological functions, mediated by the brain, not always under willful control.

The impact of Brain Injury may not be immediately evident given age-related demands

Rates of Development for the Four Regions of the Brain



Peak Maturation Periods.

The mean rate of growth for the four regions of the brain reveals the landmarks of cerebral maturation, which are marked by five distinct peak periods between the ages of 1 to 21.

Graphs on pp. 4, 5, 6 and 9 adapted from *Int J Psychophysiol* 1992;12:24 with authors' permission.

And what about Concussion?

- Incidence of diagnosed concussions among people under age 20 increased 71% between 2010 and 2015 among the general population
- Greatest increase among girls, up 119%
- Impact of a single concussion…

The New York Times 10.05.2016

A Single Concussion May Have Lasting Impact

Concussion Impact

- **For some, having a single concussion changes their lives**
- **Large scale study in Sweden** (Fazel et al., 2016)
  - N of 104,000; data collected over 40 years
  - Those with a single diagnosed concussion were much more likely than their siblings to:
    - Receive medical disability as adults
    - Seek mental health care
    - Complete less education
    - Die prematurely

Juvenile Justice Project Elements

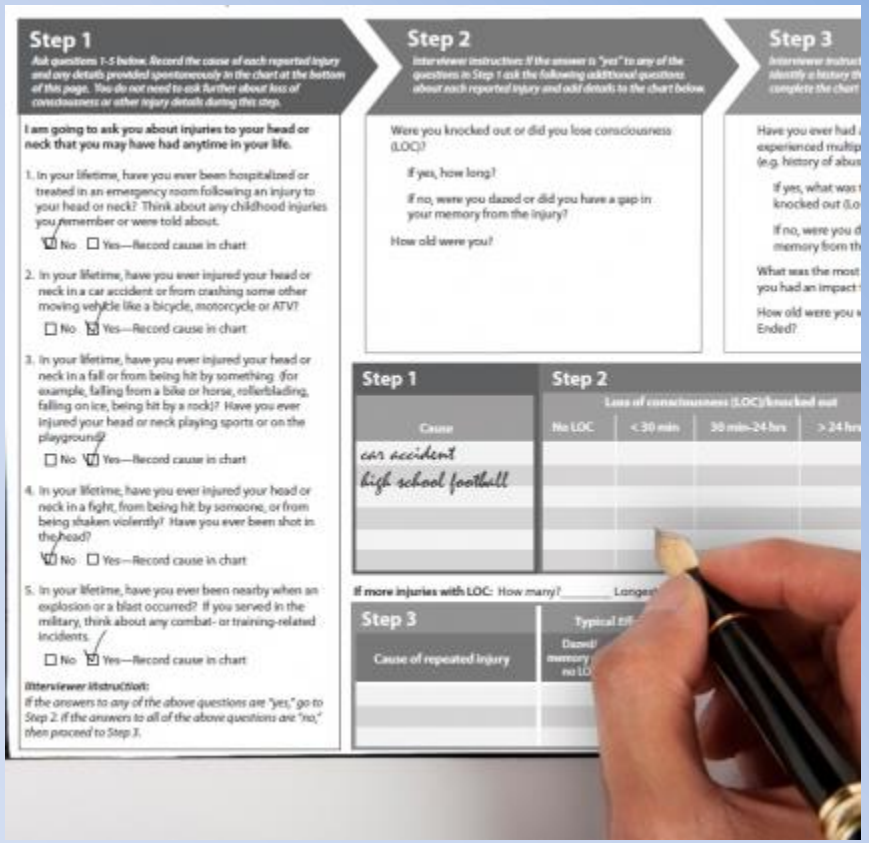
Funded by TBI Implementation Grant #H21MC17232 from the U.S. Department of Health and Human Services Health Resources and Services Administration (HRSA). obtained by the PA Department of Health and implemented by the Brain Injury Association of Pennsylvania

- Formal Screening
- Neurocognitive Testing
  - Brief neurocognitive assessment battery
- Brain Injury Education and Counseling
- Education and Support for Related Systems
- NeuroResource Facilitation

Screening

- **Research shows that a semi-structured interview reviewing a lifelong history of events that could have caused a brain injury is the BEST way to identify possible history**
- **There are multiple instruments that can be used:**
  - Traumatic Brain Injury Questionnaire
  - Ohio State University TBI-Identification Form
  - Brain Injury Screening Questionnaire

OSU TBI-Identification Method



OSU-TBI Identification Method

- **Step 1: Event history questions**
- **Step 2: Details about each event report**
  - Age at event
  - Loss or alteration of consciousness
- **Step 3: Questions about period of multiple injuries**
- **CNS Supplement**
  - Questions about **non-traumatic** conditions such as infections, stroke, anoxia, epilepsy, lead exposure

What does a Positive Screening Mean?

- Not all possible episodes of brain injury lead to cognitive impairment
- Certain episode characteristics are associated with a greater likelihood of long-lasting effects
- Neurocognitive testing can be used to determine if likely brain injury impairments are present

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

WORST INJURY

- One moderate or severe TBI

FIRST INJURY

- TBI with any loss of consciousness before age 15

MULTIPLE INJURIES

- 2 or more TBIs close together…or 3 injuries with altered states of consciousness

RECENT INJURY

- Mild TBI in recent weeks, more severe TBI in recent weeks

Neurocognitive Assessment

- Focuses on Memory and Executive Functioning
- Compares an individual's performance to a sample of peers (same age, gender, education)
- Short battery can take as little as 2 hours to administer; full batteries are often longer
- Different from the typical psychological evaluation and/or IQ testing

NeuroCognitive Assessment

Battery of tests used in this project:

- WRAML, Wide Range Assessment of Memory and Learning- Second Edition (WRAML-2)
- Wechsler Individual Achievement Test-Third Edition (WIAT-III) - Reading Comprehension and Math Problem-Solving
- Behavior Rating Inventory of Executive Function-Self-Report Version (BRIEF-SR) and Parent Version
- Delis-Kaplan Executive Functioning System (D-KEFS)

Results

- Determine if individual is likely to have difficulty in school, work, and independent living
- Offer a cognitive profile of relative strengths and weaknesses
- Suggest strategies to compensate for problems
- Suggest possible resource connections and interventions
- Report serves as a qualifier for some resources

NeuroResource Facilitation

- Service provided to individuals with BI and their families
- Purpose of Neuro-Resource Facilitation (NRF) is to increase the independence & quality of life of individuals living with brain injuries.
- Begins with education about brain injury and its effects on the individual
- Has been shown to increase community participation and productivity
  (Reed et al., 2011; Trexler et al., 2010)

NeuroResource Facilitation

- **Assists individuals with a brain injury to:**
  - Understand and navigate programs that support persons with disabilities
  - Find and apply for the most relevant programs and services to meet their needs and attain their goals
  - Problem-solve any barriers that may arise
- **Goes beyond making referrals. NRF continues throughout the process until services are in place.**

Connection to Services

- Special Education/School Re-Entry
- Vocational Rehabilitation
  - Transition services
  - Pre-employment assistance
  - Supported employment
- Medical Providers
  - Physiatry or neurology
  - Related therapies
- Support Groups/ Counseling

Summary of Findings: Adult Corrections

PA 2013-2015	N=164
Screened Positive Events that could have caused a Brain Injury	75.95%
Average Number of Events per Individual	4.1
Percentage of Events that Occurred before age 21	75%
Showed Evidence of Neurocognitive Impairments on Standardized Testing	71.59%

JUVENILE Summary of Data (through 3/13/17)

Screened for Brain Injury	339
Screened Positive for an Event that could have caused a Brain Injury	181 (53%)
Administered NeuroCognitive Testing	111
Showed Evidence of Impairments	59 (53%)

Strategies for At-Risk Populations

Improved Identification of Brain Injury

- Regular screening of children
- Consideration for TBI when it is not primary diagnosis
- Regular medical follow-up with a focus on unmet needs
- Anticipation of the possibility of sequelae which may not become evident until adolescence

Strategies for At-Risk Populations

Improved Concussion Management

- Education of individuals and families regarding symptom management and risk for future injury
- Mechanisms for follow-up and referral
- Improved connections with schools for appropriate resource connections
- Monitor for possible consequences including academic, social, and behavioral difficulties

Strategies for At-Risk Populations

Referral for appropriate services

Medical Providers

- Physiatry or Neurology
- Rehabilitation therapies
- Neuropsychology

School

- Special education/disability student services
- Brain injury-specific programs (check your local brain injury advocacy group)

Work

- Vocational rehabilitation

Family Education

- Provide a description of problems which may surface at future developmental points
- Instruct family to include history of brain injury when seeking any medical, psychological, educational services/resources
- Provide written information, reflecting these recommendations and any others
- Offer single-point-of-contact for assistance if needed

Brain Injury Resources

www.brainline.org

www.cdc.gov/traumaticbraininjury/

www.biausa.org/

www.msktc.org/tbi/factsheets

For further information

BRAIN INJURY ASSOCIATION OF PENNSYLVANIA

www.biapa.org

Toll Free Brain Injury Resource Line

1-800-444-6443

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A certificate of attendance may be requested via the survey.

surveymonkey.com/r/IPRCwebinarsurvey

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An evaluation link and instructions will be emailed to all registrants. Please share with all attendees.


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QUESTIONS
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Group Discussion Questions

Use these questions to spark discussion within your organization about this topic.

1. How can our organization improve patient tracking of patients following brain injury to help identify red flags through the stages of development?
2. What education do we provide to clients and their families regarding problems that could surface later in life? Do we need more?
3. Are there local/community resources that we should explore? Do we have the right partnerships to best serve this population?
4. How does our organization screen clients for prior brain insults? How does that impact the care we provide?