



## Brain Injury and Child Development

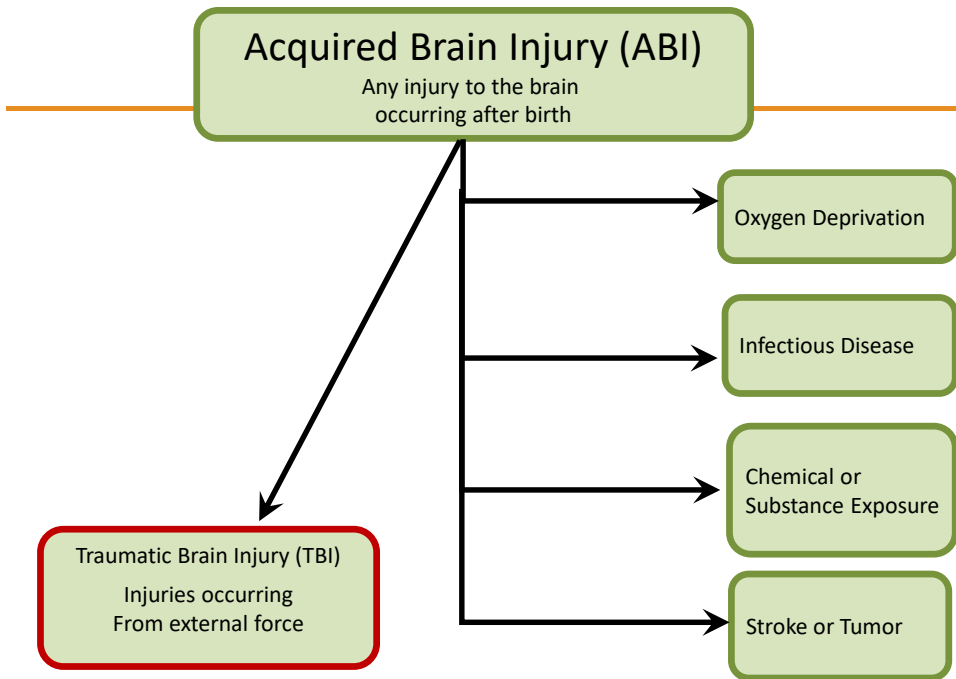


Rebecca Quinn, MSW, LMSW, CBIST

[rebecca.quinn@und.edu](mailto:rebecca.quinn@und.edu)

701-777-5200

*Help for Today,  
Hope for Tomorrow.*

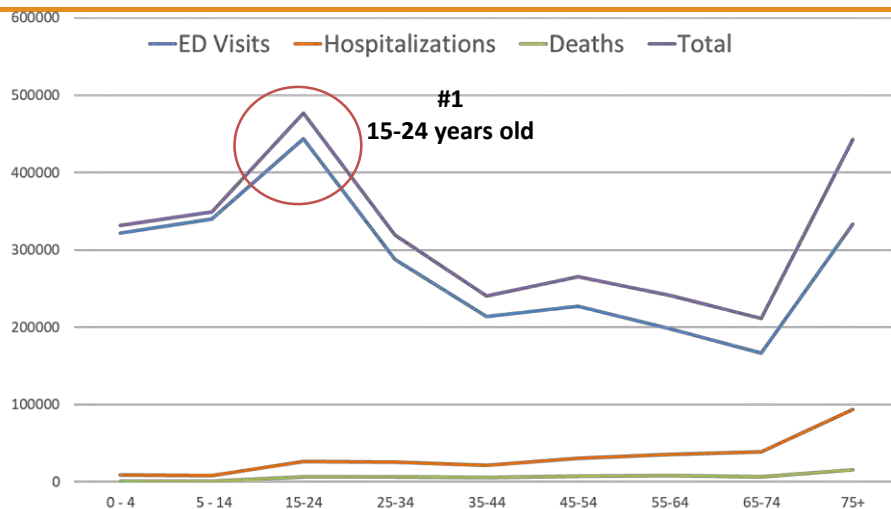


## TBI Incidence Nationally

- 1.4 million children/yr in US
- 2.3 male to female
- Highest risk groups  
15-19, then 0-4
- Only 1/6 admitted  
to hospital

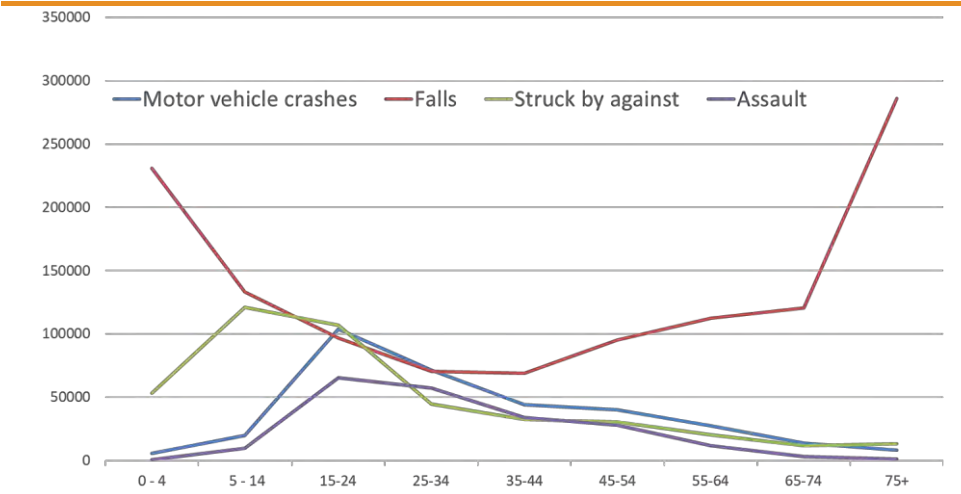


### Rates of by Age Group



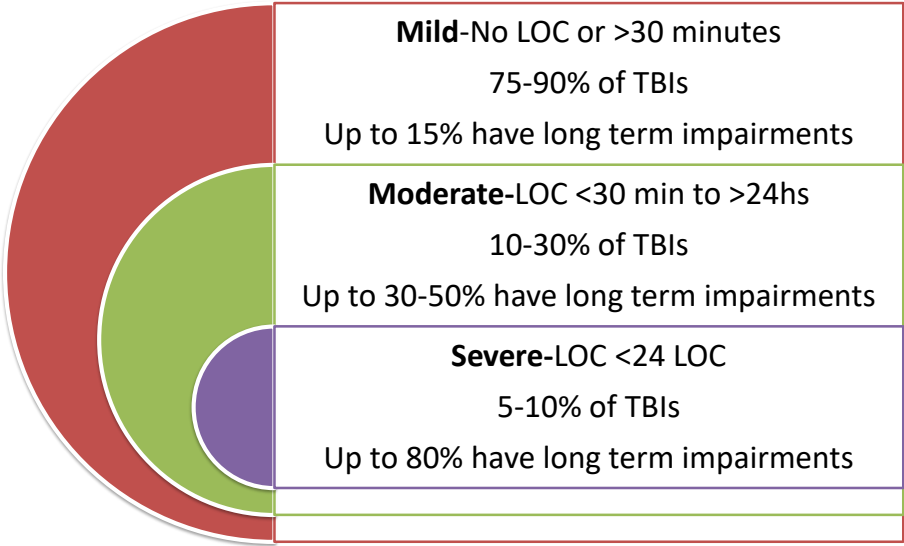
Source: [https://www.cdc.gov/traumaticbraininjury/get\\_the\\_facts.html](https://www.cdc.gov/traumaticbraininjury/get_the_facts.html) retrieved 10.05.2020

## Leading Causes by Age Group



Source: [https://www.cdc.gov/traumaticbraininjury/get\\_the\\_facts.html](https://www.cdc.gov/traumaticbraininjury/get_the_facts.html) retrieved 10.05.2020

## Severity Continuum



## Mild can be a Misnomer

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- Degree of physical injury does not always determine the degree of difficulty related to long-term functioning.
- **“Multiple Mild”**  
New understanding that multiple mild injuries has compounding effects



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Traumatic brain injury is a **leading** cause of death and disability for children and teens.



## Why is TBI a “Silent Epidemic”?

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- Lack of Understanding of Long-term Impact
- Not screened for
  - Older injuries forgotten
- Children appear and test “normal”
  - Do well on test, but not in real world
- Children misdiagnosed
  - TBI masks as other conditions/disabilities

## Importance of Accurate Identification

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- Receive appropriate interventions
- Prevent a cycle of failure
- Allows development of self advocacy skills
- Allows for awareness of potential cognitive stall

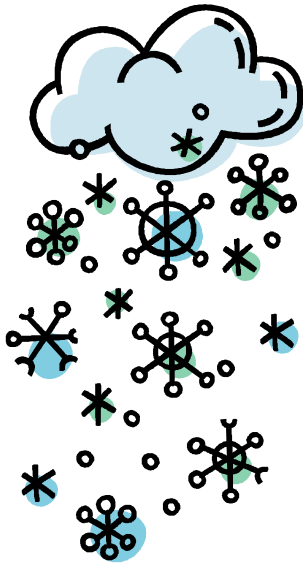
## Screening for Brain Injury

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- Important to even have it on your radar as a provider.
- Myth that younger is better and older injuries don't impact later development.
- Screenings are available.

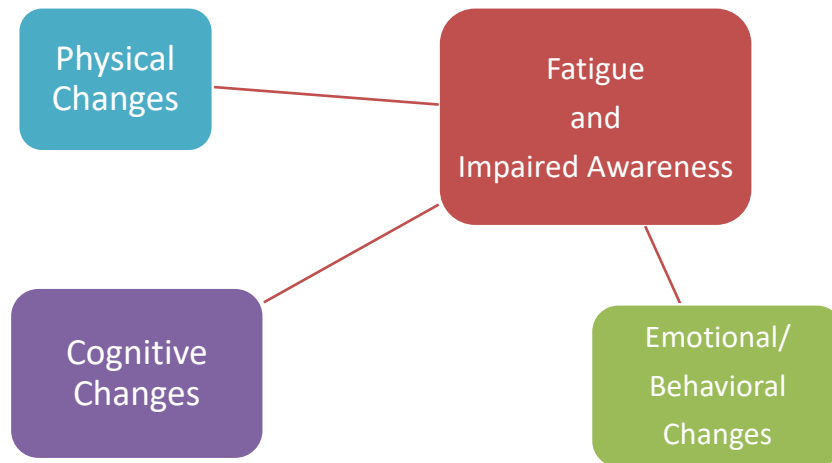
Brains are like snowflakes.....

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All brains start out  
unique and all  
brain injuries are  
unique!

## Possible Consequences after a Brain Injury



## Possible Impairments after a Brain Injury

Physical	Cognitive	Emotional/ Behavioral
<ul style="list-style-type: none"> <li>• Motor coordination</li> <li>• Hearing and visual Loss</li> <li>• Spasticity and tremors</li> <li>• Fatigue and/or weakness</li> <li>• Loss of taste and smell</li> <li>• Balance</li> <li>• Mobility</li> <li>• Speech</li> <li>• Seizures</li> <li>• Headaches or migraines</li> <li>• Pain</li> <li>• Changes in sleep patterns</li> </ul>	<ul style="list-style-type: none"> <li>• Attention-Inability to complete task without reminders</li> <li>• Slowed processing Speed</li> <li>• Difficulty with Memory particularly working memory</li> <li>• Executive function deficits               <ul style="list-style-type: none"> <li>• Difficulty with decision-making, planning, sequencing</li> <li>• Impaired judgment</li> <li>• Problem-solving difficulties</li> </ul> </li> <li>• Organizational problems</li> <li>• Reduced fixability in thinking</li> </ul>	<ul style="list-style-type: none"> <li>• Impulsivity, Irritability, Impatience</li> <li>• Problems with emotional control</li> <li>• Inappropriate behavior</li> <li>• Inability to inhibit remarks</li> <li>• Lack of response to social cues</li> <li>• Problems with initiation</li> <li>• Reduced self-esteem</li> <li>• Difficulty relating to others</li> <li>• Difficulty maintaining or forming relationships</li> <li>• Increased anxiety and frustration</li> <li>• Depression</li> </ul>

## Outcome Predictors

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- Severity of injury
- Age of child
- Child's previous functioning
- Family life and support system previous to injury
- Access to appropriate acute care and rehabilitation

## Unique to Children

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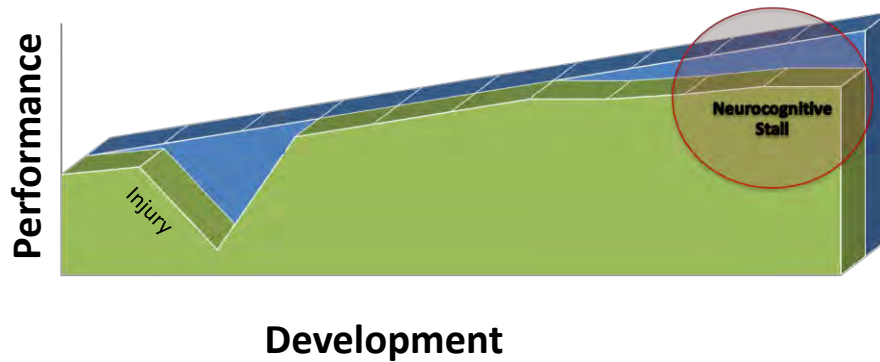
- More likely to survive than adults
- Less likely to lose consciousness
- Myth that younger is better
- Less than 2% are referred for special education services



## “Growing into the Injury”

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Time **reveals** rather than **heals**



## Younger Injury

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Benefits	Negatives
<ul style="list-style-type: none"> <li>• Earlier access to services</li> <li>• Growing up with awareness of injury and possible changes factored into vision of life plan</li> </ul>	<ul style="list-style-type: none"> <li>• Unaware of all the ramifications-“growing into the injury”</li> <li>• Struggle to move beyond label</li> <li>• Unknown of life planning</li> </ul>

# Stages of Brain Development

## Building Blocks of Brain Development©



Image taken from CO Dept of Ed; BI in Children and Youth

## Stages of Brain Development Post Brain Injury

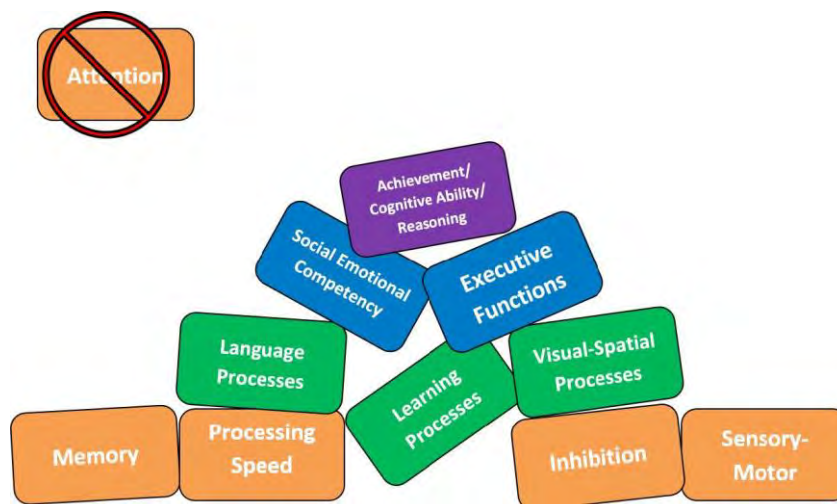


Image taken from CO Dept of Ed; BI in Children and Youth

## Brain Injury in Adolescence/Young Adulthood

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- Shift toward independence
- Injury creates an identity disconnect
  - Who am I now vs who should I have been?
- Grief over lost potential
- Unable to resolve sense of self
- Measures of Self worth
  - Education-Job- Family-Friends-Home



## Intervention Challenges

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- Lack of awareness of own challenges
- Deficits in building blocks impact later skills
- Poor response to traditional behavioral modification



## TBI vs. ADHD & LD

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- Retain old skills, difficulty with new learning
- Peaks and valleys of performance
- Importance of executive function
- Social and behavioral difficulties
- Poor response to behavior modification

## Remember....

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- No magic wand!
- Every brain injury is unique

“While the rest of the world is trying to get ahead of the ball, the brain injured person is trying to determine what the ball is, where the ball is, and perhaps even why the ball is.”—Survivor



## Accommodations

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- Frequent reviews
- Provide a TOUCHSTONE person
- Structured environment
- Focus on WHAT TO DO, not what not to do
- Focus on antecedents

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*"Unidentified traumatic brain injury is an unrecognized major source of social and vocational failure,"*

Wayne A. Gordon, director of the Brain Injury Research Center at Mount Sinai School of Medicine in New York



## Case Study 1

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- Adam, 17 year old hockey player
- Was checked into the boards and felt dazed for several minutes after
- Later that same evening started having blurred vision and nausea
- At school the next day he went to the nurse complaining of a headache and went home sick for the day
- Symptoms continue for several weeks

## Case Study 2

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- 10 year old Christina, in MVA
- Unsure if she lost consciousness on the scene of accident
- Spent several weeks at level 1 trauma center
- Sustained a skull fracture, lost vision in one eye, rods inserted in back and legs



## Case Study 3

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- 18 month old, Jack, was born at 30 weeks
- Hydrocephalus, lead to a stroke
- Not making typical developmental gains related to physical components
- Appears on track with “Speech” (babbling) and vision (will track objects, etc)

