



NORTH DAKOTA
BRAIN INJURY
NETWORK

The Impact of Brain Injury on Childhood Development

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*Help for Today,
Hope for Tomorrow.*

Why worry about pediatric TBI?

- #1 cause of pediatric death and disability in U.S.
- Annual incidence of hospitalization for head injuries = 200-300/100,000 children
- More than 400,000 emergency room visits and hospitalizations per year
- Annual economic cost of pediatric TBI in the U.S. in the billions



52,000

Deaths

275,000

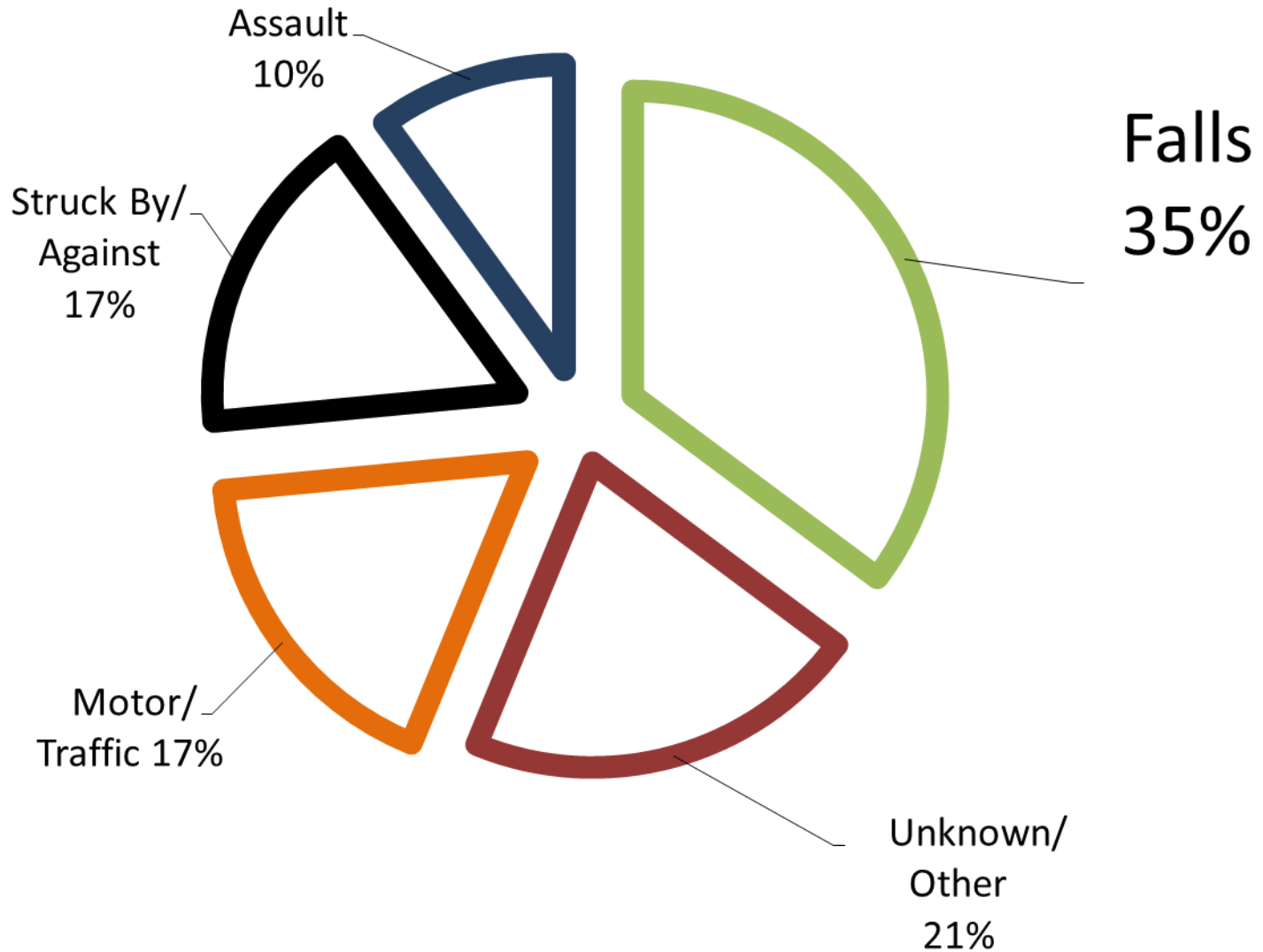
Hospitalizations

1,385,000 ER Visits

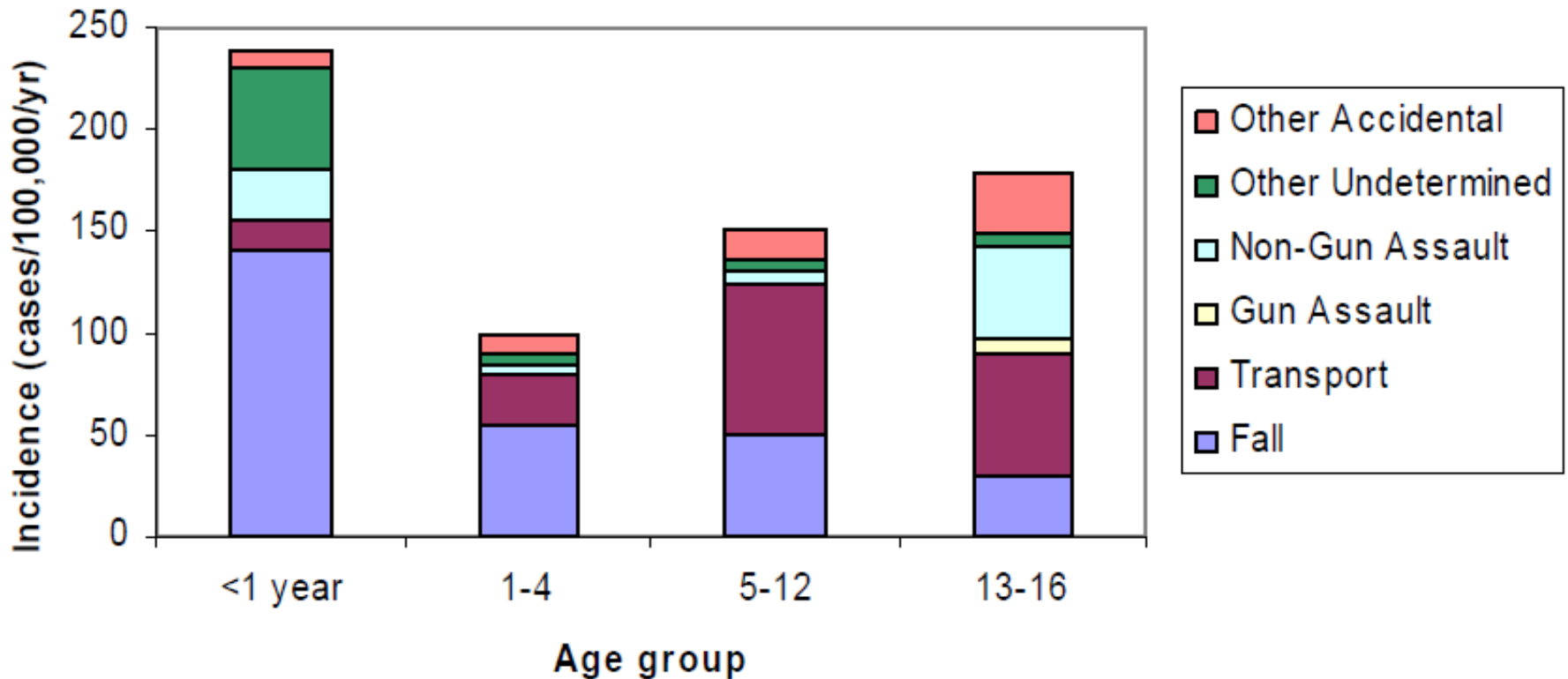
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Receiving Other Care or No Care

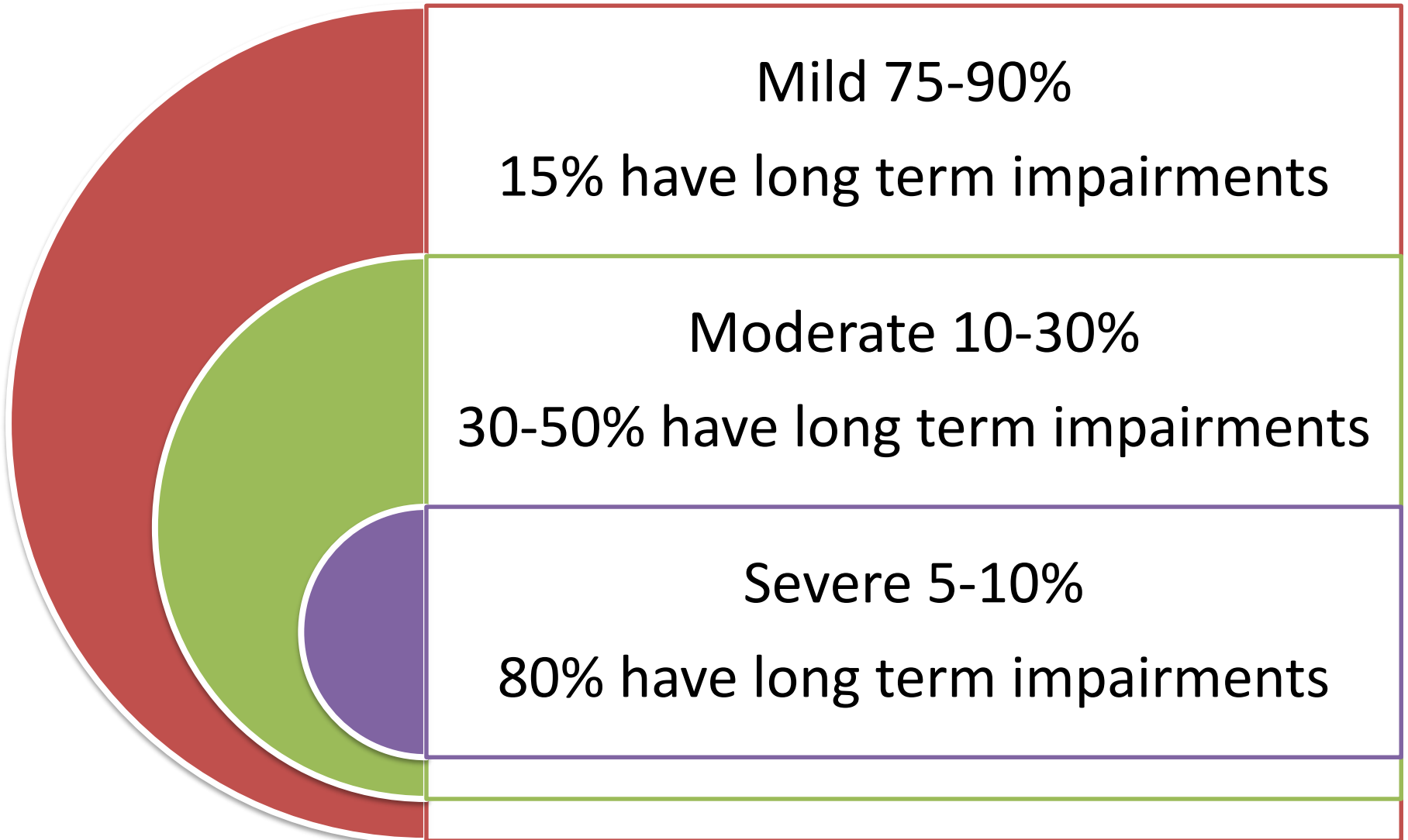
Leading Causes of TBI



Causes by Age



Severity Continuum

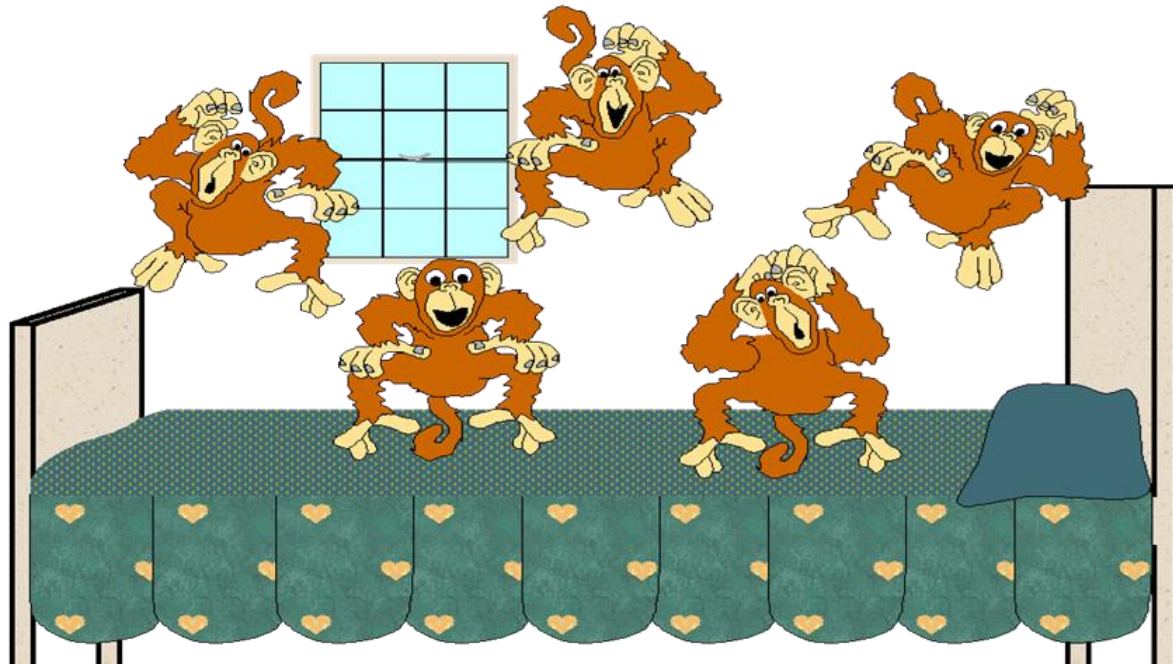


Mild can be a Misnomer

- 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



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



Why is TBI a “Silent Epidemic”?

- Lack of awareness
- Childhood injuries forgotten
- No outward signs/conclusive measures
- Unreported/non-accidental injuries
- Minor blows to the head or “concussions” are often not perceived as “brain injuries”

Unique to Children

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

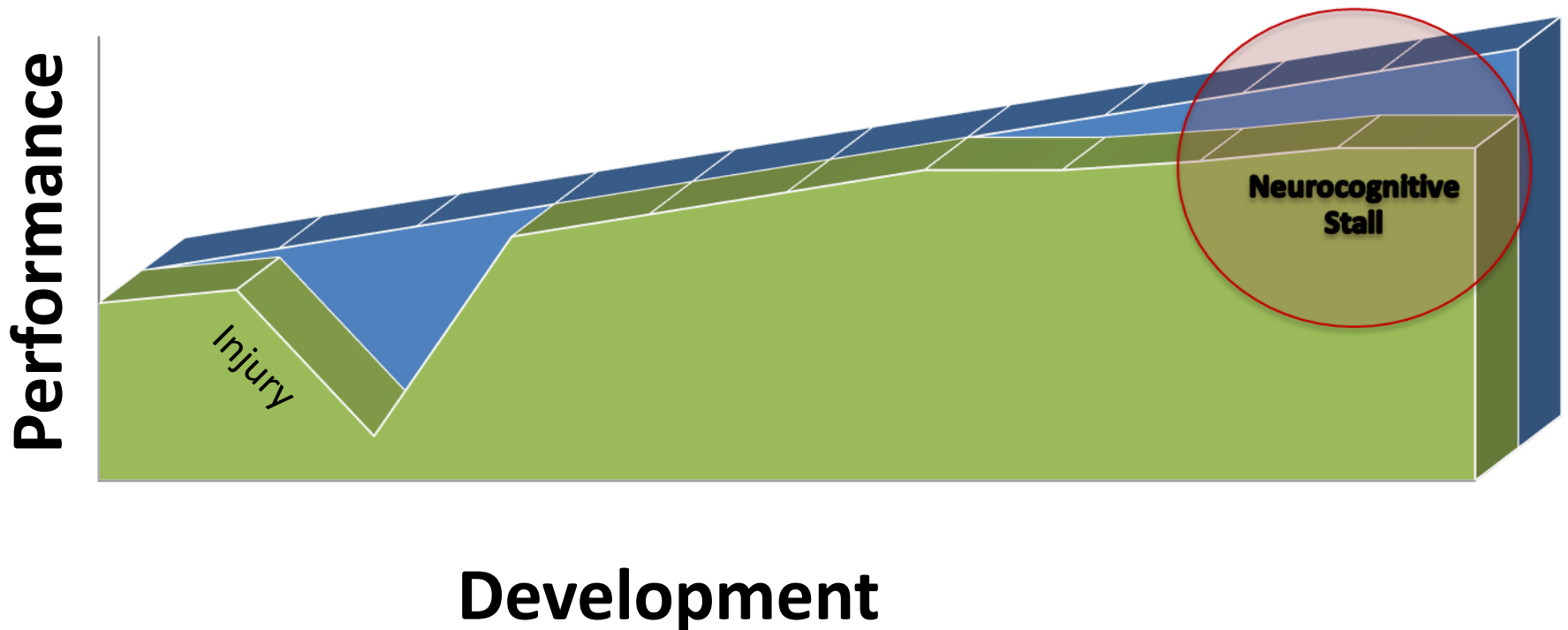


Dispelling the Myths

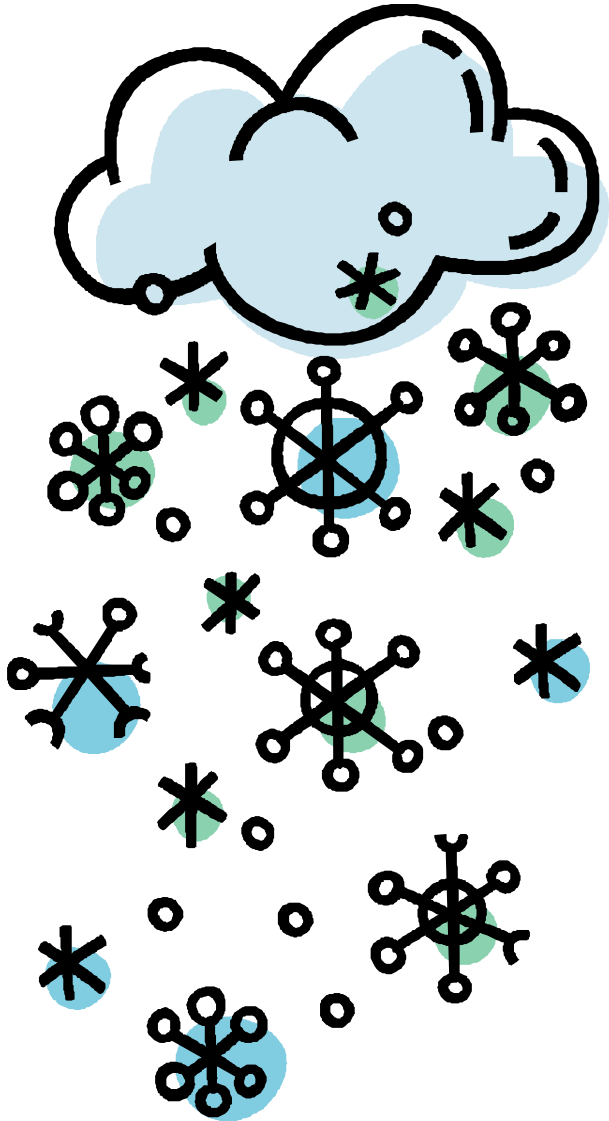
- The “two year” issue:
 - “...but we were told they will have recovered within two years”
 - “...after two years you will know the full extent of any possible permanent injury”
- ...But they are children and their brains are still developing, so they will be able to compensate as they grow and develop...

Time reveals rather than heals.

“Growing into the Injury”



Brains are like snowflakes.....



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

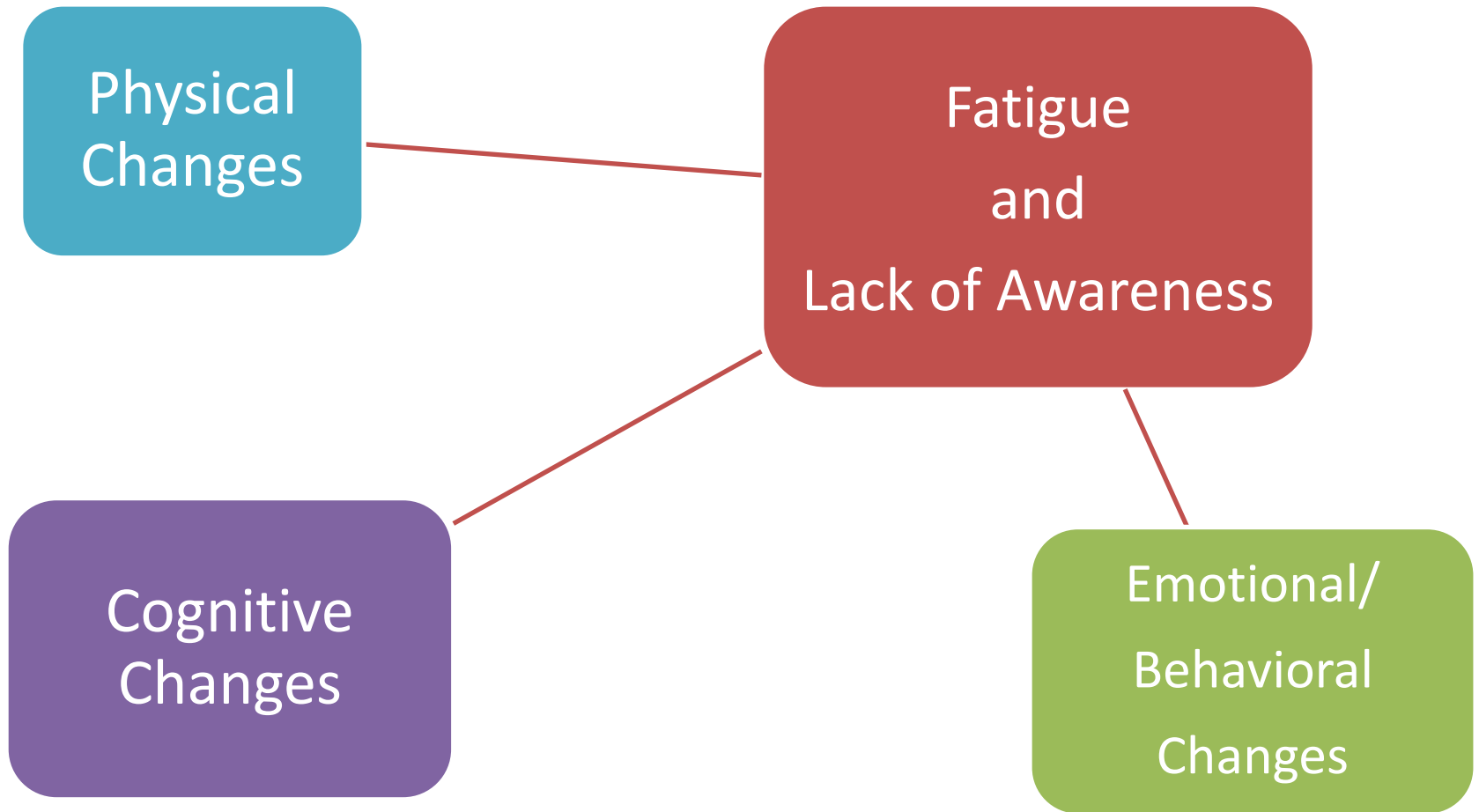
Challenge with Assessments

- TBI often not screened and no definitive test
- May appear and test “normal”
 - Less effect on achievement testing, more on performance and behavior
- May misdiagnosed
 - TBI masks as other disabilities

Challenges with Assessments

- Unique constellation of deficits
 - Attention
 - Memory
 - Executive functions
 - Behavioral regulation
- A moving target
 - Changes over time with recovery
 - Variability in outcomes

Possible Consequences after a Brain Injury



Impact of Injury on Development

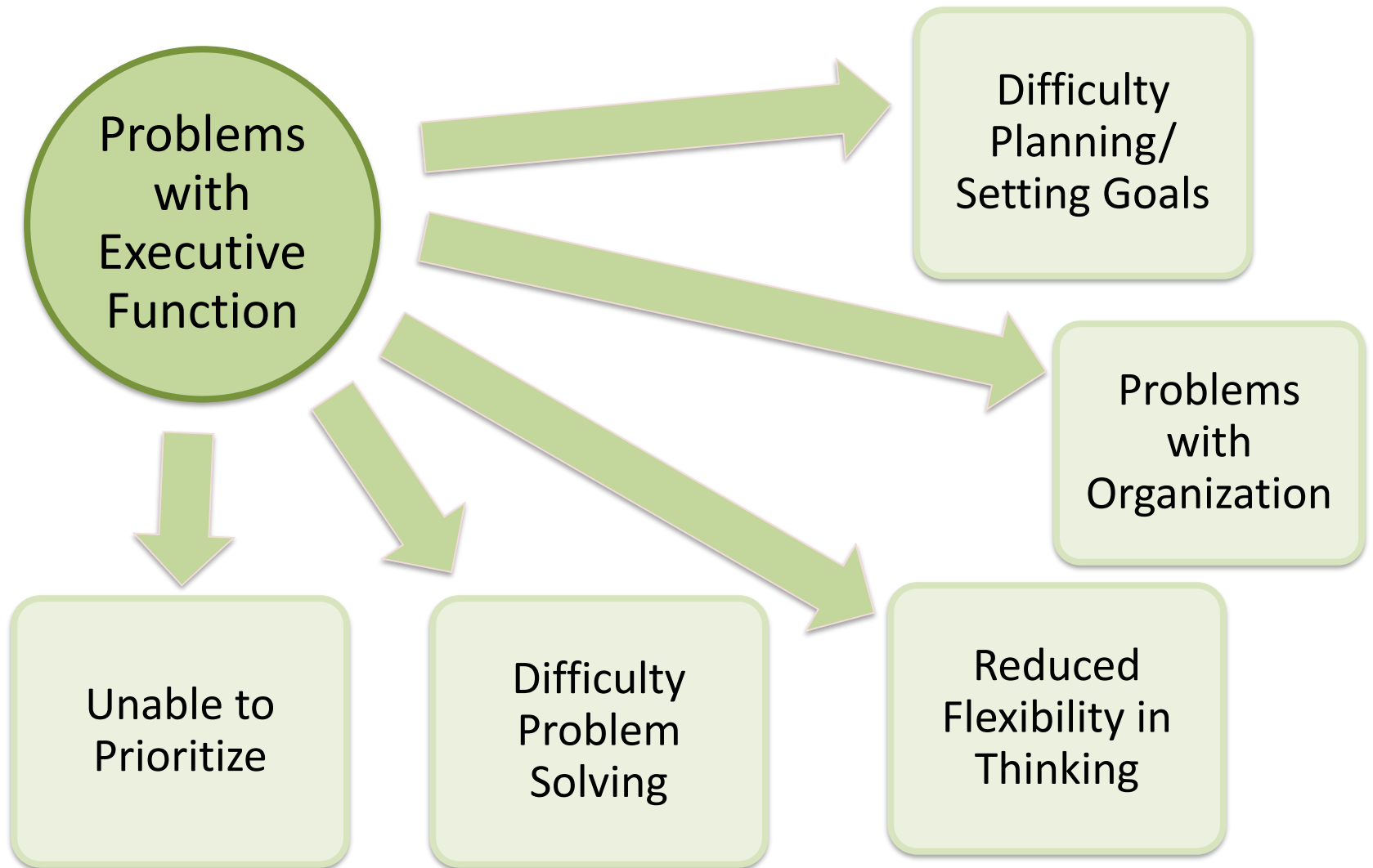
Early Years	5-10	Adolescence
Basic motor skills	Fine & gross motor skills	Executive functioning – planning, problem solving Development of greater social skills
Basic social skills (sharing)	Social & emotional development	
Basic problem solving	Cognitive development	
Language development	Increased language capability	
Most susceptible to TBI		

Cognitive Difficulties

- Attention
- Processing speed
- Learning and Memory
- Problems with Executive Function



Changes in Executive Functioning



Emotional/Behavioral Changes

- Impulsivity, Irritability, Impatience
- Social skills problems
 - Inappropriate behavior
 - Inability to inhibit remarks
 - Inability to recognize social cues
- Reduced self-esteem/over inflated sense of self
- Stress/anxiety/frustration and reduced frustration tolerance

Behavioral Challenges

- Poor response to traditional behavioral modification
- Lack of awareness of own behavior
- Lack of impulse control
- Disinhibited behaviors that could disenfranchise friendships/ impact on school life

The Path Through Adolescence to Adulthood

- All teenagers can be a handful!
- All teenagers sleep a lot!
- All teenagers can be moody

...but the adolescent with an brain injury it is compounded with the unknown effects and awareness.



Importance of Accurate Identification



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

"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



Criminal Justice

Studies show prevalence of history of TBI in prisoners is as high 60-87%



Minnesota study:

Males 82%

Females 90%

Juveniles 99%

Homelessness

45% of homeless men found to have history of TBI

87% prior to losing home

70% sustained as a child or teen

Causes:

- Assaults 60%
- Sports and Rec 44%
- MVC 24%

➤ Topolovec-Vranic, J et. al. 2014



Domestic Violence

In 167 women reporting to ERs for injuries associated with DV:

- 30% experienced a loss of consciousness on at least one occasion
- 67% reported residual problems that were potentially TBI related

➤ Corrigan et.al., 2003

Substance Abuse

Studies estimate:

Half accessing SA have a history of TBI

AND

Half requiring inpatient rehab have a history of SA

Between 10% and 20% of persons with TBI will develop a substance use problem for the first time after their injury

➤ Brainline

Suicide Risk

Danish study found:

- Even seven years after injury, TBI patients still faced a 75 percent higher risk of suicide
- All types of head injuries were tied to an increased risk of suicide, but severe traumatic brain injury had the highest risk

