Return to School following Traumatic Brain Injury

Juliet Haarbauer-Krupa, PhD, FACRM
Senior Health Scientist, TBI Team
Division of Injury Prevention
National Center for Injury Prevention and Control (NCIPC)
Session Overview

• What is a Traumatic Brain Injury (TBI)?
• Epidemiology of TBI
• What we currently know about TBI in Children
• Effects of TBI in Children
• Return to School Following a TBI
A traumatic brain injury, or TBI, is an injury that affects how the brain works.

It may be caused by a:
• Bump, blow, or jolt to the head
• Penetrating injury (such as from a gunshot) to the head

There are three main types of TBI:
• Mild TBI or concussion
• Moderate TBI
• Severe TBI
Epidemiology of TBI
Epidemiology of TBI

CDC collects and reports TBI data to understand:
• How many people are affected by this injury
• Who is most at risk
• The leading ways a person may get a TBI
• Whether programs to prevent TBI are working

Source: https://www.cdc.gov/traumaticbraininjury/data/index.html
Parents report 2.5% of children have a history of TBI in the United States.

Epidemiology of TBI

Not all visits for concussion are in the Emergency Department

Where Are Most Youth Concussions First Diagnosed?

Point of Entry Data from The Children’s Hospital of Philadelphia show the vast majority of youth concussions are diagnosed in a primary care setting.

- Primary Care: 82%
- ED/Urgent Care: 12%
- Specialty Outpatient: 5%
- Hospital Inpatient: 1%

Children and their families experience two models of care for Concussion and TBI:

- **Healthcare**
- **School**

### Identification of TBI

#### Healthcare
- Healthcare provider makes the diagnosis based on CDC definition/ICD-CM codes
- Current data is from Emergency Department visits
- Some children are seen by a pediatrician or family practitioner, especially for mild injuries.
- In some settings the athletic trainer makes the initial diagnosis

#### School
- PARENT OR STUDENT REPORT
- Discharge letter or information from healthcare visit conveyed to school
- Teacher report of a change in student behavior
- Observation of a TBI event at school

---

**EVENT OCCURRED BUT DID NOT SEEK MEDICAL CARE**
Understanding How TBI Affects Children
What we know about TBI across the Pediatric Lifespan

Imaging has advanced

Multiple TBIs Mean Something
What we know about TBI across the Pediatric Lifespan

TBI Mechanism of Injury Varies by Age

Age at the time of injury means something. Younger children are at risk for long term effects.
# What we know about TBI Across the Pediatric Lifespan

**Past and Current Health History Means Something**

Children with a lifetime history of TBI are more likely to have co-occurring health conditions

<table>
<thead>
<tr>
<th>Condition</th>
<th>Lifetime History of TBI</th>
<th>No Lifetime History of TBI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Disorder</td>
<td>21%</td>
<td>9%</td>
</tr>
<tr>
<td>ADHD</td>
<td>20%</td>
<td>8%</td>
</tr>
<tr>
<td>Speech/Language Problems</td>
<td>19%</td>
<td>8%</td>
</tr>
<tr>
<td>Developmental Delay</td>
<td>15%</td>
<td>5%</td>
</tr>
<tr>
<td>Bone, joint or muscle problems</td>
<td>14%</td>
<td>3%</td>
</tr>
<tr>
<td>Anxiety</td>
<td>13%</td>
<td>4%</td>
</tr>
<tr>
<td>Depression</td>
<td>11%</td>
<td>3%</td>
</tr>
<tr>
<td>Behavior Problems</td>
<td>8%</td>
<td>2%</td>
</tr>
<tr>
<td>Hearing Problems</td>
<td>7%</td>
<td>3%</td>
</tr>
</tbody>
</table>

What we know about TBI Across the Pediatric Lifespan

**Heterogeneity** in Injury Effects and Outcomes – related to multiple factors

- injury characteristics
- individual child characteristics
- the child’s environment
What we know about TBI Outcomes Across the Pediatric Lifespan
What we know about TBI Across the Pediatric Lifespan

TRANSITION

Childhood

Becoming an adult

Adulthood
Report to Congress on the Management of TBI in Children

Juliet Haarbauer-Krupa, PhD
Senior Health Scientist
Traumatic Brain Injury Team
Division of Unintentional Injury Prevention,
National Center for Injury Prevention and Control

Ann Glang, PhD
Director
Center on Brain Injury Research and Training,
University of Oregon

Brad Kurowski, MD, MS
Director
Brain Injury Rehabilitation Program
Division of Physical Medicine and Rehabilitation
Cincinnati Children’s Hospital Medical Center

Matt Breiding, PhD
Team Lead
Traumatic Brain Injury Team
Division of Unintentional Injury Prevention,
National Center for Injury Prevention and Control
Report to Congress on the Management of TBI in Children

+ **TBI Act of 2014**
+ The United States Congress directed CDC, in consultation with the National Institutes of Health to: "**conduct a review of scientific evidence related to brain injury in children and submit a Report to Congress that describes the results and makes recommendations**"

+ Released in March 2018
Report to Congress on the Management of TBI in Children

- Identifies gaps in health care, school, and community services

- Highlights policy strategies to address the short and long-term consequences of a TBI

- Offers **specific and actionable recommendations** to improve TBI care in children, and advance our understanding of TBI care in the future
Report to Congress Recommendations

- Ensure that all children who return to school following a TBI are monitored
- Coordination of care across settings (medical, educational)
- Train educational professionals
- Understand Transitions
  - From elementary to middle to high school
  - From pediatric to adult healthcare
- Conduct Research
  - Need for longitudinal studies
  - More comprehensive surveillance estimates
The World Health Organization (WHO) defines a chronic disease as having one or more of the following characteristics:

1) has a long duration
2) caused by non-reversible pathologic alterations
3) requires specialized training of the patient for rehabilitation
4) may require a long period of observation, supervision or care

TBI as a chronic health condition in children

- Research is emerging on the long-term effects in children, indicating the effects of TBI can remain over the child’s lifespan into adulthood.

Most studies report on Moderate to Severe TBI

TBI as a chronic health condition in children

- Adults who report a childhood injury report post TBI health and behavioral changes that result in financial and emotional challenges.
Return to School after TBI
Promising Practices Overall

• Facilitate parent Involvement
• Share materials and ideas about Return to School Program Communication and Collaboration
• Partner with academic institutions and other TBI stakeholders
• Use evidence to form policies and practices
Policy and Legislative Impact

Return to Play and Return to Learn Laws

School Health Plan

Special Services Laws
- 504 plans
- Special Education Laws
CDC HEADS UP
Resources for Schools
How Can I Help My Child Recover After a Concussion?

This handout includes common concussion symptoms your child may experience, and tips you can use to help with recovery.

Most children with a concussion, a type of traumatic brain injury, feel better within a couple of weeks. However, for some, symptoms will last for a month or longer. Concussion symptoms may appear during the normal healing process, or as your child gets back to their regular activities. If there are any symptoms that concern you or are getting worse, be sure to seek medical care as soon as possible.

RECOVERY TIPS FOR YOUR CHILD’S CONCUSSION SYMPTOMS

Making short-term changes to your child’s daily activities can help him or her get back to a regular routine more quickly. As your child begins to feel better, you can slowly remove these changes. Use your child’s symptoms to guide his or her return to normal activities. If your child’s symptoms do not worsen during an activity, then this activity is OK for them. If symptoms worsen, your child should cut back on that activity.

It is important to remember that each concussion and each child is unique, so your child’s recovery should be customized based on his or her symptoms. Factors that may delay recovery include your child having a history of a previous concussion or other brain injury, neurological or mental health disorders, learning difficulties, or family and social stressors.

QUICK TIPS

Ensure your child avoids activities that can put him or her at risk for another injury to the head and brain.

Help your child keep a positive attitude. Most children with a concussion feel better within a couple of weeks.

Ensure your child gets enough rest.
Research shows giving a letter to schools increases school-based accommodations for a student with a concussion.
CDC has a training for educators on concussion among children.
CDC has a training for healthcare providers on concussion among children.
Online Trainings

Athletic Trainers

Healthcare Providers

School Professionals

HEADS UP to Athletic Trainers
Online Concussion Training

Get Started

HEADS UP to Schools:
Online Concussion Training for School Professionals

Start Training

School professionals play an important role in the recovery process for students experiencing concussion symptoms. This course will empower you to better support students recovering from concussion through understanding, monitoring, and accommodating their individual needs.
Online Trainings

Youth Sports Coaches

High School Sports Coaches

Sports Officials
Summary

• Children experience TBI and Concussion across the age span of childhood.
• Children and their families navigate two models of care – Healthcare and School Systems
• Children can experience long term effects over their school career and into adulthood.
TBI is not just an event.

Report to Congress

The Management of Traumatic Brain Injury in Children

Go.usa.gov/xnvbq
Thank you!

The findings and conclusions in this presentation are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Juliet Haarbauer-Krupa, PhD FACRM
Email: WUK1@cdc.gov