

Slides & sources

Under the Individuals with Disabilities Education Act (IDEA), Traumatic Brain Injury is defined as:

"...an acquired injury to the brain caused by an external physical force, resulting in total or partial functional disability or psychosocial impairment, or both, that adversely affects a child's educational performance."

<https://www.specialeducationguide.com/disability-profiles/traumatic-brain-injury/>

Key Distinctions:

- **Acquired:** The injury occurs *after* birth. It is not congenital, degenerative, or induced by birth trauma.
- **External Force:** It involves a physical event (fall, car accident, sports injury, assault).
- **Open vs. Closed:** It includes open head injuries (penetrating) or closed head injuries (internal pressure/shearing).

<https://www.specialeducationguide.com/disability-profiles/traumatic-brain-injury/>

TBI: Prevention & Risk Reduction

- **Falls:** reduce slip/trip hazards; use supervision in higher-risk areas (stairs, wet floors, playground transitions).
- **Bicycle & motor vehicle accidents:** emphasize consistent safety practices and protective behaviors during travel to/from school.
- **Sports/playground accidents:** enforce safety rules, supervision, and

safe use of equipment during PE/recess.

- **Child abuse & violence/gunshot wounds:** follow mandated reporting procedures; strengthen school safety systems and student support.

TBI is often called the "silent disability" because the physical recovery may seem complete while cognitive and emotional struggles remain.

Characteristics are typically grouped into three categories:

Cognitive & Physical

- **Memory:** Difficulty retaining new information (short-term memory) is the most common hurdle.
- **Executive Functioning:** Struggles with planning, initiating tasks, and organization.
- **Processing Speed:** Students often require significantly more time to process verbal questions or written text.
- **Physical:** Chronic headaches, fatigue, and sensitivity to light or noise.

<https://www.inclusivechildcare.org/resource-library/website/national-dissemination-center-children-disabilities>

The Cognitive Profile & IQ

- **No Fixed IQ:** There is no "typical" IQ range for TBI. A student may remain in the "High Average" range but lose the ability to organize their thoughts.
- **Processing speed is the most common cognitive decline.** The student still has the intellectual "machinery," but the "gears" turn much more slowly.
- **Asymmetrical Skills:** You may see a student who can solve complex calculus (long-term memory/logic) but cannot remember where their locker is (short-term memory).

Heward, W. L., Alber-Morgan, S. R., & Konrad, M. (2022). *Exceptional Children: An Introduction to Special Education*.

Social & Behavioral

- **Emotional Lability:** Sudden mood swings or "outbursts" that seem disproportionate to the situation.
- **Impulsivity:** Decreased "filters"; saying or doing things without considering consequences.
- **Social Isolation:** Difficulty reading social cues or keeping up with fast-paced peer conversations.

Area of Impact	Instructional Strategy
Information Overload	Give instructions in "chunks" (one step at a time).
Memory Deficits	Use "External Aids" (checklists, digital recorders, graphic organizers).
Fatigue	Schedule core subjects (Math/ELA) in the morning; allow for "brain breaks."
Sensory Issues	Provide a quiet workspace and, if possible, reduce fluorescent lighting.

The 2008 study by Taylor et al. on traumatic brain injury (TBI) in young children shows how early neurological trauma can affect a child's development. Although children are often described as "resilient," this research indicates that the preschool brain is particularly vulnerable, particularly with respect to the complex skills required for school readiness.

The study compared three groups of children with TBI (severe, moderate, and mild) with a control group with orthopedic injuries (OI), which accounted for the general stress of injury and hospitalization. The findings showed that children with severe TBI exhibited broad impairments in memory, spatial reasoning, and executive function. Children with moderate TBI exhibited more specific impairments, primarily in memory and executive functions, but their overall cognitive ability remained largely stable. The study also found that the family environment mattered; lower socioeconomic status and higher parental stress exacerbated the negative effects on skills such as vocabulary and spelling.

These findings make me think about how hard it is to notice these kinds of deficits. From my own experience with young children, it's easy to see a lack of focus or difficulty with basic concepts as merely "behavioral issues" or "late blooming." However, the study shows that even a moderate injury can alter how a child processes information and regulates their responses. I wonder how many children starting kindergarten are having a hard time, not because they aren't trying, but because they are still affected by an injury that happened months ago, even if they seem physically recovered.

The study also brings up important questions about children with mild TBI. Even though the results were not statistically significant, the "medium effect sizes" in verbal fluency and switching tasks suggest that even minor concussions might have hidden effects that need more research. This raises additional questions: How do these problems change over five to ten years? Do they go away, or do they accumulate and cause children to fall further behind as school becomes more challenging? Also, since girls in the study did

better than boys in several areas, what biological or social factors might be protecting them?

As an educator, I see that these findings indicate that we need to change how we support children's return to school. We should begin assessing cognitive and readiness skills soon after a child leaves the hospital, rather than waiting for them to struggle in class. For children with nonverbal or executive function difficulties, we should use structured teaching methods, such as memory aids, repeated practice, and extensive practice. Since a tough home environment can make TBI effects worse, schools should also support families to help children recover. This research underscores that starting school is not merely an academic step but also a significant challenge for the brain.

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