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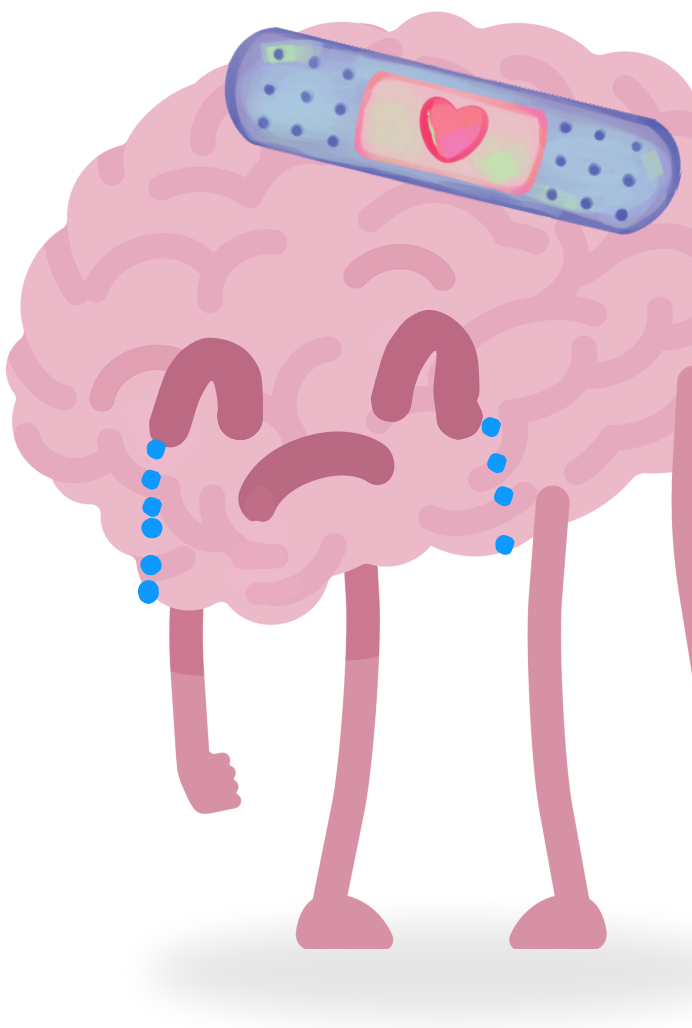
Research "database":

# Traumatic Brain Injury



**"Traumatic Brain Injury** means an acquired injury to the brain caused by an external physical force, resulting in total or partial functional disability or psychosocial impairment, which adversely affects educational performance. The term applies to both open or closed head injuries resulting in impairments in one or more areas, such as cognition; language; memory; attention; reasoning; abstract thinking; judgment; problem-solving; sensory, perceptual and motor abilities; psychosocial behavior; physical functions; information processing; and speech. The term does not include brain injuries that are congenital or degenerative, nor brain injuries induced by birth trauma."
(California Department of Education, 2025)

## Eligibility

**"A student shall be eligible** under the category of traumatic brain injury if both of the following are met:
a. There is medical evidence that the student has an acquired injury to the brain, caused by an external physical force, resulting in total or partial functional disability or psychosocial impairment, or that adversely affects the student's educational performance; and
b. The traumatic brain injury is either an open or closed head injury, resulting in impairments in one or more areas such as: Cognition, Language, memory , attention, reasoning , or abstract thinking
The team of qualified professionals and the parent may not identify a student as having a traumatic brain injury if the brain injury is congenital or degenerative, or induced by birth trauma."
(Congress, 2020)

## Prevalence

According to the CDC (2021) children ages birth to 17 account for 8.6% of TBI-related hospitalizations. In 2017, California had 1,331 students under 22 received special education services between 2023-2024 (California Department of Education, 2025). Experts believe this TBI statistics are under reported. Only 26,000 students are getting services under the TBI category despite 812,000 emergency room visits for TBI for children Birth – 17 (Childers & Hux, 2016; Harvey et al., 2020).

## Causes

**Falls**: Are the most common cause of TBIs and happen most often among the youngest and oldest age groups.
**Blunt trauma accidents:** Involve being struck by or against an object, sports-related injuries are the most common cause of TBI.
**Vehicle-related injuries:** Being a passenger or a pedestrian in an accident, this is the third most common cause of TBI.
**Assaults and violence: "**Abuse-related TBIs result from intimate partner violence, assaults, shaken baby syndrome, and wounds to the head caused by gunshots or other weapons."
**Explosions and blasts: "**TBIs caused by blast trauma from roadside bombs have become a common injury to service members in military conflicts. The majority of these TBIs are classified as mild head injuries."
(National Institute of Neurological Disorders and Stroke, n.d.)

## Characteristics

**Physical symptoms of TBI:**
- Headache
- Convulsions or seizures
- Blurred or double vision
- Unequal eye pupil size or dilation
- Clear fluids draining from the nose or ears
- Nausea and vomiting
- New neurological problems (such as slurred speech, weakness of arms, legs, or face, or loss of balance)

(National Institute of Neurological Disorders and Stroke, n.d.)

**Cognitive and behavioral symptoms of TBI:**
- Loss of or change in consciousness for anywhere from a few seconds to a few hours
- Decreased level of consciousness (like being hard to wake up) Confusion or disorientation
- Problems remembering, concentrating, or making decisions
- Changes in sleep patterns (such as sleeping more, difficulty falling or staying asleep, and an inability to wake up) Frustration or irritability

(National Institute of Neurological Disorders and Stroke, n.d.)

**TBI in children:**
- Changes in eating or nursing habits
- Persistent crying, irritability, or crankiness—specifically with an inability to be consoled
- Changes in ability to pay attention
- Lack of interest in a favorite toy or activity
- Changes in sleep patterns
- Seizures
- Sadness
- Loss of a skill, such as toilet training
- Loss of balance or unsteady walking
- Vomiting

(National Institute of Neurological Disorders and Stroke, n.d.)

**Protentional secondary disability:**
- Posttraumatic seizures (seizure activity that often occurs after moderate or severe injuries)
- Hydrocephalus (buildup of fluid in the brain that increases pressure)
- Deep vein thrombosis (blood clots in the legs, which can be dangerous if untreated)
- Heterotopic ossification (abnormal bone growth in muscles or soft tissues that may limit movement)
- Spasticity (muscle stiffness, tightness, or involuntary spasms)
- Gastrointestinal and genitourinary complications (digestive or bladder/kidney problems, which are common after TBI)
- Gait abnormalities (difficulty walking or changes in movement patterns)
- Agitation (restlessness, aggression, or difficulty calming down)
- Chronic traumatic encephalopathy [CTE] (a long-term degenerative brain condition linked to repeated head injuries)

(Verrill, 2024)

## Post school outcomes

Traumatic brain injuries (TBI) often result in memory, attention, processing speed, executive function, and cognitive fatigue difficulties, along with disrupted sleep, social-emotional regulation, and impaired linguistic and sensorimotor skills (Covington, Vruwink, & Vining, 2025; Childers & Hux, 2016; Harvey et al., 2020). Outcomes vary by age at injury, with younger children at greater risk for persistent reading and arithmetic difficulties, lower academic growth, and ongoing behavioral challenges (Catroppa, Anderson, & Morse, 2025). Long-term effects include impaired judgment, decision-making, planning, organization, social skills, and emotional regulation, such as inappropriate outbursts or reduced empathy (Fowler & McCabe, 2011). As a result, Visnick and team (2023) found that TBI was associated with not achieving secondary school qualifications. Childers and Hux (2016) interviewed 5 college students with reported Mild TBI found that they often struggled with memorization and task initiation after sustaining their TBI. As a result many of these interviewed students stated they had difficulty meeting postsecondary expectations due to cognitive disruptions mentioned earlier. In terms of employment, Poppen, Lindstorm, & Unruh (2017) found that despite individualized services, vulnerable groups such as those with traumatic brain injuries, were more likely to face barriers when joining the workforce. They suggest a need for further individualized career development and transition planning while they are still in school.

## How teachers can Help

- **Curate IEP Goals for specific learning needs and track progress toward acquisition of skills (Childers & Hux, 2016; Fowler & McCabe, 2011)**
- **Educate ALL staff working with a student on TBI and about the student themselves. Students had an easier time when supports were easily accessible and approachable (Childers & Hux; Fowler & McCabe, 2011)**
- **Provide more time so students can have time to memorize and encode content, process information and reinforce knowledge, and apply knowledge-- such as writing (Childers & Hux, 2016)**
- **Provide more structure, reports, or emotional supports benefited students, but was dependent on the student (Childers & Hux, 2016)**
- **Value based intervention: Identify new ways for students to live according to their values. This increased their feelings of control and reduced symptom related distress and encouraged renewed engagement in life activities. (Covington, Vruwink, Viningm 2025)**
- **Purpose-Oriented Rehabilitation: Reconnect students with their values, strengths, and source of personal meaning. Help students make intentional daily choices in alignment to their values. (Covington, Vruwink, Viningm 2025)**

# References


California Department of Education. (2025, May 21). Special education – CalEdFacts. https://www.cde.ca.gov/sp/se/sr/cefspeced.asp

California Department of Education. (2025, June 25). CALPADS primary disability category codes. California Department of Education. https://www.cde.ca.gov/ta/tg/ca/disablecodes.asp

Catroppa, C., Anderson, V. A., Morse, S. A., Haritou, F., & Rosenfeld, J. V. (2008). Outcome and predictors of functional recovery 5 years following pediatric traumatic brain injury (TBI). Journal of Pediatric Psychology, 33(7), 707–718. https://doi.org/10.1093/jpepsy/jsn006

Covington, N. V., Vruwink, O., & Vining Radomski, M. (2025). Purpose in life after brain injury: Expanding the focus and impact of interdisciplinary rehabilitation. American Journal of Speech-Language Pathology, 34, 1843–1854. https://doi.org/10.1044/2024_AJSLP-24-00113

Fowler, M., & McCabe, P. C. (2011). Traumatic brain injury and personality change. Communiqué, 39(7), 4–10.

Harvey, J., Farquharson, K., Schneider-Cline, W., Bush, E., & Pelatti, C. Y. (2020). Describing the composition of individualized education plans for students with traumatic brain injury. Language, Speech, and Hearing Services in Schools, 51(3), 839–851. https://doi.org/10.1044/2020_LSHSS-19-00074

The Individuals with Disabilities Education Act: A comparison of state eligibility criteria. (2025, September 24). https://www.congress.gov/crs-product/R46566

National Institute of Neurological Disorders and Stroke. (n.d.). Traumatic brain injury (TBI). National Institutes of Health. https://www.ninds.nih.gov/health-information/disorders/traumatic-brain-injury-tbi

Poppen, M., Lindstrom, L., Unruh, D., Khurana, A., & Bullis, M. (2017). Preparing youth with disabilities for employment: An analysis of vocational rehabilitation case services data. Journal of Vocational Rehabilitation, 46(2), 209–224. https://doi.org/10.3233/JVR-160857

State Council on Developmental Disabilities. (n.d.). IEP eligibility worksheet. https://scdd.ca.gov/wp-content/uploads/sites/33/2024/01/IEP-Eligibility-worksheet.pdf

Verrill, D. S. (2024, March 19). Classification and complications of traumatic brain injury: Practice essentials, epidemiology, pathophysiology. Medscape. https://emedicine.medscape.com/article/326643-overview?form=fpf

Visnick, M. J., Pell, J. P., Mackay, D. F., Clark, D., King, A., & Fleming, M. (2023). Educational and employment outcomes associated with childhood traumatic brain injury in Scotland: A population-based record-linkage cohort study. PLOS Medicine, 19(3), Article e1004204. https://doi.org/10.1371/journal.pmed.1004204