Brain Injury Alliance of Connecticut (BIAC)

Connecticut's partner in brain injury prevention & recovery for more than 30 years.

An independent, non-profit organization dedicated to supporting individuals with brain injuries, their families, and caregivers while increasing awareness of brain injury and its prevention.

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What Is brain injury?

Acquired brain injuries are typically brain injuries occurring after birth but not related to degenerative diseases, congenital or hereditary factors. They may cause temporary or permanent impairment(s). Impairments can include physical functions, cognition and psychosocial behaviors. Causes of acquired brain injury can include, but are not limited to the following:

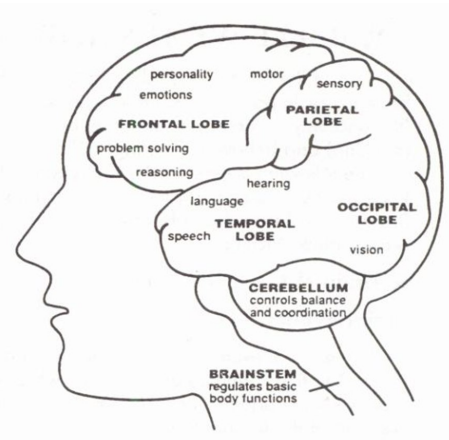
- Strokes
- Traumatic Brain Injury (TBI)
- Substance Abuse
- Anoxia/Hypoxia (loss of oxygen to the brain)
- Infections
- Seizures
- Tumors
- Toxic Exposures

In basic terms, **traumatic brain injuries** are typically defined as a blow or jolt to the head or body, or a penetrating head injury that disrupts brain function. Not all blows and jolts to the head result in a TBI. You don't necessarily have to hit your head to sustain a brain injury. If your body sustains a very hard blow or shake which causes your brain to move rapidly and forcefully within your skull, then this might also cause some injury to the brain. In addition, blast injuries, such as seen in our military, can also cause injury to the brain.

Impairments from a brain injury can be temporary or permanent, and the range of impairment can be partial or full. The severity of a TBI is usually considered to be within a range from 'mild'—a brief change of mental status or consciousness, to 'severe'—an extended period of unconsciousness or memory loss after injury.

Causes of traumatic brain injury can include, but are not limited to the following:

- Falls
- Motor Vehicle Crashes
- Struck by/against incidents
- Assaults
- Gunshot Wounds
- Sports Injuries
- Blast Injuries
- Other injuries caused by trauma



In adolescents and teens, the most common causes of injury to the brain include being struck by or against something, sports & recreational injuries, assaults, motor vehicle crashes, and falls.

How does brain injury affect you?

The human brain controls everything we do, including breathing, walking, talking, thinking, behaving and feeling. Unlike a bone that can break and heal, our brains can be injured and not repair themselves. While up to 80% of mild brain injuries, such as concussions, can resolve in 2-3 weeks, some mild and more severe brain injuries usually have lifelong consequences that affect an individual on a day to day basis.

Brain injury affects every individual differently, and no two brain injuries are alike, but there are common consequences of brain injury. Brain injury can cause a wide range of functional short or long-term changes affecting thinking, sensation, language, or emotions.

- Motor Issues (motor control and coordination, loss of the range of motion, paralysis)
- Cognition & Thinking (memory, reasoning, organization, planning, problem solving, attention, concentration)
- Sensation (touch, taste, and smell, as well as our ability to withstand multiple sensory inputs—bright lights, noisy backgrounds, a lot of visual stimuli)
- Language (communication, including expressive and receptive language—taking in and understanding information and conveying information, and understanding)
- Emotional & Behavioral (depression, anxiety, personality changes, aggression, acting out, and social inappropriateness)

There are many factors that contribute to how brain injury will affect an individual, including the severity of injury, type of injury, age at the time of injury, location of the injury, personality of the individual prior to the injury, and the supports (both emotional and financial) available to that individual at the time of injury. For some, the injury will impact mobility and language in such a way that it is obvious to those around them, and impairs their ability to live independently in an obvious matter. For example, they may need assistance with bathing, dressing, eating and getting around—requiring the use of a mobility device and/or communication device. For others, the injury will impact cognition and thinking, along with emotions, and it will not be obvious to others how the injury is affecting them, however it still may affect their ability to live independently. For example, they may have difficulty completing schoolwork, finding and/or maintaining a job, managing day to day household tasks, such as paying bills, maintaining a schedule, keeping up with mail, developing and/or maintaining relationships and/or cooking meals.

Brain injury is often referred to as the “silent epidemic” because it occurs more commonly than the general public is aware of, and is under recognized and under identified among the general public, professionals and sometimes even the medical community. It can also be invisible to the human eye, as symptoms can often be subtle and not obviously apparent. For this reason, the Brain Injury Alliance of Connecticut strives to raise awareness about the effects of brain injury on individuals and their families, as well as the prevention of brain injury.

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Mild brain injury & concussions

Approximately 75% of all brain injuries that occur each year are ‘mild’, commonly called concussions.
A ***concussion*** is a type of traumatic brain injury—or TBI—caused by a bump, blow, or jolt to the head or by a hit to the body that causes the head and brain to move rapidly back and forth. A concussion doesn’t always show up on brain imaging, such as a CT scan or MRI. This is because a concussive type of injury has more to do with metabolic and chemical changes in the brain than a visible physical or functional change.

Immediate signs and symptoms of a concussion can include:

- Confusion or feeling foggy
- Dizzy or lightheaded
- Loss of balance
- Disoriented to time and place
- Glassy-eyed or blurred vision, as well as double vision
- Slurred speech
- Loss of consciousness, although it is important to keep in mind that 90% of concussions have no loss of consciousness

Ongoing symptoms of concussion can include:

- Headache—a symptom reported in 70% of those with concussion
- Nausea or vomiting
- Sensitivity light or sound
- Difficulty focusing or concentrating
- Slower processing speed and reaction time
- Irritability, anxiety and depression

Rest is the key component in recovery from concussion, including physical rest and cognitive rest. Just as you would rest a sprained ankle your brain also needs rest. A graduated return to play is considered best practice, along with a graduated return to learn.

Repeated concussions occurring over an extended period of time (i.e., months, years) can result in cumulative neurological and cognitive deficits. Multiple concussions occurring within a short period of time (i.e., hours, days, or weeks) can be catastrophic or fatal. Second impact syndrome, considered an adolescent phenomenon, can occur when a second concussion occurs when the prior concussion is not fully healed. The consequences of second impact syndrome are lifelong disability or death.

It is also important to note that protective devices, such as helmets, headbands, and mouth guards, cannot prevent a concussion. While a helmet can prevent serious injury, including skull fractures, they cannot prevent your brain from moving inside your skull when an impact occurs.

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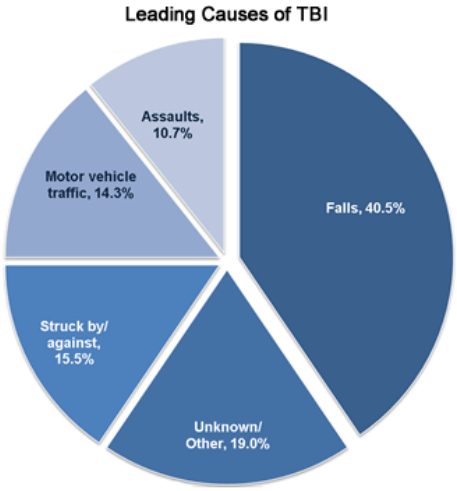
How common is brain injury?

In 2010, about 2.5 million emergency department (ED) visits, hospitalizations, or deaths were associated with TBI either alone or in combination with other injuries—in the US. TBI contributed to the deaths of more than 50,000 people, and TBI was a diagnosis in more than 280,000 hospitalizations and 2.2 million ED visits. These consisted of' TBI alone or TBI in combination with other injuries. In CT, there are over 36,000 hospital ED visits and hospitalizations annually for TBI-related injuries.

It is important to note that statistics on brain injury do not include acquired brain injury. Additionally, the Centers for Disease Control—which collects TBI statistics at a national level—acknowledges that data has not had sufficient sample sizes to produce reliable yearly estimates, does not include those seeking care at physician's offices, urgent care centers or other non-emergency outpatient departments, and that TBI incidence estimates are likely under counted.

Leading causes of brain injury



Among non-fatal TBI-related injuries for 2006–2010:

- **Assaults were the leading cause of TBI-related ED visits for persons 15 to 24 years of age.**
- Falls were the leading cause of TBI-related ED visits for all but one age group.

The leading cause of TBI-related **hospitalizations** varied by age:

- Falls were the leading cause among children ages 0-14 and adults 45 years and older.
- **Motor vehicle crashes were the leading cause of hospitalizations for adolescents and persons ages 15-44 years.**

The leading cause of TBI-related **death** varied by age.

- Falls were the leading cause of death for persons 65 years or older.
- **Motor vehicle crashes were the leading cause for children and young adults ages 5-24 years.**
- Assaults were the leading cause for children ages 0-4.

Among TBI-related deaths in 2006–2010:

- **Men were nearly three times as likely to die as women.**
- Rates were highest for persons 65 years and older.

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How can brain injury be prevented?

In Connecticut alone there are approximately 36,000 deaths, emergency department visits and hospitalizations that result from traumatic brain injury (TBI) each year. TBI is also considered the leading cause of death and disability in children and adolescents. To help lower your chances of getting a concussion or other serious brain injury, make a conscious effort to stay safe and protect your brain.

* **Buckle Up:** Despite the fact that wearing a seat belt increases your risk of surviving a crash by 75%, teens buckle up far less frequently than adults. Buckling up in the backseat is just as important, as unbelted passengers continue to move at the speed of the vehicle they are riding in until they hit something. In CT you are required to wear your seat belt in the back seat up to age 17, but encouraged to always wear your seatbelt, no matter where you are sitting. Remember that air bags were never intended to replace seat belts, but to work together to protect drivers and passengers.

* **Just Drive:** 10% of all drivers ages 15-19 years involved in fatal crashes were reported as distracted at the time of injury, and using a cell phone while driving doubles the risk of getting into a crash. Drivers looking out the windshield can ***miss seeing up to 50%*** of what's around them when talking on any kind of a cell phone, including hands free. Recent studies have shown that there is no significant difference in hand-held and hands free cell phones, which is why it is best to let all calls, texts and notices wait. Plus, if you're a teen in CT and get caught using your hand-held cell phone 3 times you will be facing of a 6 month license suspension, and $175 fine to restore your license. Distractions while driving can be visual, manual or cognitive, so put down the phone, the food, the brush or whatever else is distracting you and JUST DRIVE!

* **Graduated Driving License (GDL):** The human brain continues to develop until age 25, and recent studies found that the portion of the brain that assesses risk and danger does not full develop until the mid-20s. The GDL is a period of supervised driving before getting a basic driver license that introduces driving privileges in stages – providing an opportunity to gain experience and practice. Since 2004, Connecticut has seen an 84% drop in teen driver fatalities due to the GDL. Learn more about and encourage the GDL in your family.

* **Safe Cycling:** Always wear a helmet, and encourage each family member to wear a helmet—regardless of their age. In Connecticut, anyone 15 years of age or younger must wear a bike helmet, but remember that the risk of brain injury does not reduce on your 16th birthday. Also, replace your helmet after every crash!

* **Walk This Way:** A teen pedestrian is injured or killed after being struck by a car every hour in the US. Discourage distracted walking, always cross at corners, stop on the curb and look both ways, and **make eye contact with the driver** (never assume they see you).

* **Don't Play Games with Concussions:** Teens who continue to play after experiencing a concussion, or return to play before their brain is fully healed, have a greater chance of getting another concussion. In 2010, CT established a law to protect student athletes by raising awareness about concussion, and the importance of identifying, treating and managing a concussion properly. Sports are an important way to stay healthy and recognize the importance of teamwork and collaboration.

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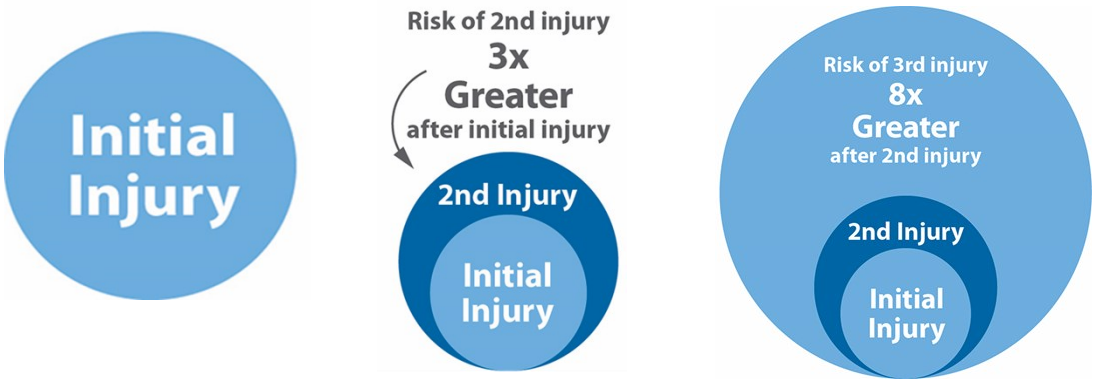
Did you know?

When someone has an injury to the brain, they are even more at risk for additional TBI's – there are several reasons for this including slower response time after the 1st injury, lack of awareness of environmental cues and unsafe situations, and decreased ability for problem solving and judgement for safe behavior after 1st injury. After the 1st brain injury, the risk for a 2nd injury is 3X greater AND after the 2nd TBI, the risk for a 3rd injury is 8X greater!



Protect Your Brain

The Protect Your Brain toolkit for high schools was developed by the Brain Injury Alliance of Connecticut to raise awareness about brain injury and the prevention of brain injury.

To learn more, go to www.biact.org/protectyourbrain

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