

A traumatic brain injury (TBI) is caused by damage to the brain's tissue resulting from an external force such as a fall or a car accident. A TBI can often affect the overall cognitive functioning of a person and may result in significant challenges with thinking and learning.

### About traumatic brain injuries

A TBI may result when a person experiences a sudden injury to the head by an external object; however, not all head traumas will result in a TBI. A TBI can happen if an object violently hits the head or when something pierces through the skull to the brain.

A head injury can cause damage to brain cells and blood vessels. A person's physical and cognitive functioning can be broadly affected by a TBI, and may cause permanent or temporary changes in how a person thinks, acts, moves, speaks and feels. A TBI may also affect parts of the body's internal functioning, such as the ability to regulate body temperature, sleep, appetite, sexual drive, energy level, etc. The extent of a person's brain injury depends on what part of the brain has been damaged and the severity of the trauma.

A TBI is also referred to as an acquired brain injury or a repeated head trauma. "Dementia pugilistica" and "punch-drunken syndrome" are two of the terms used to describe a TBI that is caused by the repeated brain damage that can result from involvement in contact-heavy sports like boxing or football.

### What are the symptoms?

Signs and symptoms of a TBI may appear immediately after the head trauma was experienced or may take several days or weeks to appear after the injury occurred. A TBI is often categorized as either being a mild, moderate or severe brain injury.

With a mild TBI, a person may not lose consciousness; however, some people may lose consciousness for a few seconds or minutes. Common symptoms associated with a mild TBI include: feeling sleepy and dizzy, nausea or vomiting, headaches, confusion, blurred vision, mood swings and difficulty with thinking and memory. Typically the person will not require more than a day of hospital observation. Mild TBI are also called concussions. A small percentage of people will have symptoms lasting for more than 6 months. Unless the person experiences repetitive concussions, the prognosis is good with full recovery of function. If the person is involved in activities that produce repeated concussions (hockey, football, etc.) the risk of developing serious problems with thinking, memory and behaviour becomes a serious issue.

In moderate and severe TBI, the person experiences altered level of consciousness or fully lose consciousness for more than 24 hours. Sometimes the person has problems remembering the day of or the days and weeks after the head injury occurs. This is more commonly seen in serious accidents or acts of violence. In addition to experiencing similar symptoms to a person with a mild TBI, someone with a severe TBI may also experience: comatose states, seizures, abnormal speech or language, loss of coordination, impaired thinking and agitation.

Depending on where the injury occurred in the brain, a TBI can cause symptoms of dementia, including memory, concentration and attention problems, speech and eating problems, balance and coordination as well as walking are often seen in moderate and severe brain injuries.

Typically in dementia post brain injury, the problem is forming new memories or remembering recent events (“short term memory”). Old memories (“long term memory”) are typically not affected.

## **How is a traumatic brain injury diagnosed?**

A physician will typically ask a number of questions related to how the injury occurred. The physician will also assess a person’s level of consciousness and may conduct some neurological exams to evaluate different aspects of a person’s cognitive functioning, such as memory and thinking.

Brain imaging (CT) may be requested by a physician depending on the nature and severity of the brain injury in order to help to detect any abnormalities in the brain such as bleeding or swelling.

## **What are the causes or the risk factors?**

Falls, car accidents and sports injuries are among the most common causes of a TBI. Older adults are at an increased risk of long-term physical and cognitive changes if they have a serious fall that causes a TBI. Some other examples of events which may result in a TBI include: explosive blasts, bullet wounds that pierce the skull and violence.

Children under the age of 4, young adults between the ages of 15 and 24 and adults over the age of 75 are most at risk of experiencing a TBI.

## **Is there treatment?**

People with a mild TBI usually do not require any treatment other than rest and at-home monitoring for any change in symptoms. Gradual return to school, work or sports activities is recommended with close monitoring. Depending on the nature of a person’s injuries, someone with a severe TBI may require a lengthy hospital stay, surgery, medication and inpatient rehabilitation.

Therapeutic approaches also help support people living with a TBI to manage the associated symptoms. Occupational therapy can help a person to relearn and perform daily activities, while physiotherapy can help improve balance, walking and movement after a brain injury has occurred. Speech therapy may be required to help people improve their ability to communicate and to learn how to use an assistive communication device, if needed. Social workers are excellent at helping patients and their relatives find a way to adapt to their new roles and realities. Often times a consultation with a neuropsychiatrist is required to help manage some of the cognitive, behavioural and emotional symptoms of a brain injury. Rehabilitation medicine specialists are also an integral part of the treatment team that a person with a brain injury requires.

## **Support is available:**

Visit the Alzheimer Society’s website at [www.alzheimer.ca](http://www.alzheimer.ca) or contact your local Alzheimer Society.

For more information on TBI, please visit the Brain Injury Association of Canada website <http://biac-aclc.ca/>.

## Additional resources:

- Alzheimer's Association:  
<http://www.alz.org/dementia/traumatic-brain-injury-head-trauma-symptoms.asp>
- Mayo Clinic:  
<http://www.mayoclinic.org/diseases-conditions/traumatic-brain-injury/basics/definition/con-20029302>
- National Institute of Neurological Disorders and Stroke:  
[http://www.ninds.nih.gov/disorders/tbi/detail\\_tbi.htm#265733218](http://www.ninds.nih.gov/disorders/tbi/detail_tbi.htm#265733218)

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## Sources:

Alzheimer's Association, *Traumatic Brain Injury*  
<http://www.alz.org/dementia/traumatic-brain-injury-head-trauma-symptoms.asp>

Mayo Clinic, *Diseases and Conditions: Traumatic Brain Injury*  
<http://www.mayoclinic.org/diseases-conditions/traumatic-brain-injury/basics/definition/con-20029302>

Mayo Clinic, *Diseases and Conditions: Dementia*  
<http://www.mayoclinic.org/diseases-conditions/dementia/basics/causes/con-20034399>

National Institute of Neurological Disorders and Stroke, *Traumatic Brain Injury: Hope Through Research*  
[http://www.ninds.nih.gov/disorders/tbi/detail\\_tbi.htm#265733218](http://www.ninds.nih.gov/disorders/tbi/detail_tbi.htm#265733218)

Traumatic Brain Injury.com, *What are the Effects of TBI*  
<http://www.traumaticbraininjury.com/understanding-tbi/what-are-the-effects-of-tbi/>

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