

## Traumatic Brain Injury: The Basics

### WHAT IS TRAUMATIC BRAIN INJURY?

Traumatic brain injury (TBI) occurs when a sudden trauma—such as a violent blow or jolt to the head or body—causes damage to the brain. TBI can be caused by a closed head injury (when the head suddenly and violently hits an object, but the skull remains intact) or by a penetrating head injury (when an object pierces the skull and enters brain tissue). The most common and mildest form of TBI is concussion, caused by a bump, blow, or jolt to the head that can alter the way the brain normally works. TBI can also result from a fall or a blow to the body that causes the head and brain to move quickly back and forth. In the United States, approximately 1.7 million people experience a TBI each year.

### WHAT ARE THE SYMPTOMS?

With mild TBI, loss of consciousness may occur for a few seconds or minutes, but not always, and a dazed feeling may follow for days to weeks after the injury. Additional symptoms may include trouble with memory, attention, concentration, or thinking; confusion; headache or lightheadedness; blurred vision or tired eyes; ringing in the ears; fatigue; behavioral or mood changes; or altered sleep patterns.

Moderate or severe TBI may cause the same symptoms, but headache may persist or worsen. In addition, repeated vomiting or nausea, dilation of the pupils, numbness or weakness in the extremities, inability to wake from sleep, slurred speech, loss of coordination, increased confusion, restlessness, and agitation may occur. In small children who experience moderate to severe TBI, these symptoms may be accompanied by persistent crying, inability to be consoled, and refusal to nurse or eat.

### WHAT ARE THE CAUSES?

Falls are the leading cause of TBI in people of all ages, according to the US Centers for Disease Control and Prevention (CDC). The second most common cause is an accidental blow to the head. Automobile accidents are the third leading cause. About 10 percent of TBIs occur because of an assault.

### HOW IS IT DIAGNOSED?

Doctors may assess the severity of a TBI using the Glasgow Coma Scale, a 15-point test that checks the ability to follow directions and move eyes and limbs, with higher scores indicating milder injuries. Sometimes doctors may order imaging tests such as x-rays, computed tomography (CT), and magnetic resonance imaging (MRI) scans in order to look for other trauma-related findings.

### WHAT TREATMENTS ARE AVAILABLE?

In the case of severe TBI, call 911 so a trained medical professional can stabilize the person to avoid further injury. For a mild brain injury, the only real treatment is rest with continuous monitoring for any changes or worsening symptoms and possible follow-up appointments with a physician.

For moderate to severe TBI, rehabilitation may include physical, occupational, and speech and language therapy and cognitive rehabilitation as well as psychological, psychiatric, or social support.

### WHAT RESEARCH IS BEING DONE?

The National Institute of Neurological Disorders and Stroke ([ninds.nih.gov](http://ninds.nih.gov)) conducts and supports TBI research through grants to major medical institutions across the country. Much of this research is aimed at preventing or reducing damage in the days after a TBI occurs.

For more *Brain & Life* articles on traumatic brain injury, go to [BrainLifeMag.org/TBI](http://BrainLifeMag.org/TBI).

For more resources and support, contact:

- Brain Injury Association of America: [biausa.org](http://biausa.org); 800-444-6443
- BrainLine: [brainline.org](http://brainline.org); 703-998-2020
- Brain Trauma Foundation: [braintrauma.org](http://braintrauma.org); 408-369-9735
- United States Brain Injury Alliance: [usbia.org](http://usbia.org); 703-960-6500

**PUBLICACIONES EN ESPAÑOL:** *Brain & Life* en Español y Basics en Español disponibles ya en [BrainandLife.org](http://BrainandLife.org); Traumatismo Cerebral: Esperanza en la Investigación: [bit.ly/NINDS-TraumatismoCerebral-Espanol](http://bit.ly/NINDS-TraumatismoCerebral-Espanol)

SOURCES: NATIONAL INSTITUTE OF NEUROLOGICAL DISORDERS AND STROKE, MAYO CLINIC; *BRAIN & LIFE*.