



Committed to your health and our community

National Traumatic Brain Injury Awareness

Traumatic brain injury (TBI), also known as intracranial injury, occurs when an external force injures the brain. TBI can be classified based on severity, mechanism (closed or penetrating head injury), or other features (e.g., occurring in a specific location or over a widespread area). Head injury is a broader category that may involve damage to other structures such as the scalp and skull. TBI can result in physical, cognitive, social, emotional, and behavioral symptoms, and outcome can range from complete recovery to permanent disability or death. Causes include falls, vehicle collisions, and violence. Brain trauma occurs as a consequence of a sudden acceleration or deceleration within the cranium or

by a complex combination of both movement and sudden impact. In addition to the damage caused at the moment of injury, a variety of events following the injury may result in further injury. These processes include alterations in cerebral blood flow and the pressure within the skull. Some of the imaging techniques used for diagnosis include computed tomography and magnetic resonance imaging (MRIs). How the myth that heart disease is a man's problem hurts women.

Types of Brain Injury

All brain injuries are unique. The brain can receive several different types of injuries depending on the type of force and amount of force that impacts the head. The type of injury the brain receives may affect just one functional area of



the brain, various areas, or all areas of the brain.



Traumatic Brain Injury

Concussion

Even a concussion can cause substantial difficulties or impairments that can last a lifetime. Whiplash can result in the same difficulties as head injury. Such impairments can be helped by rehabilitation, however many individuals are released from treatment without referrals to brain injury rehabilitation, or guidance of any sort.

A concussion can be caused by direct blows to the head, gunshot wounds, violent shaking of the head, or force from a whiplash type injury.

Both closed and open head injuries can produce a concussion.

A concussion is the most common type of traumatic brain injury.

A concussion is caused when the brain receives trauma from an impact or a sudden momentum or movement change. The blood

vessels in the brain may stretch and cranial nerves may be damaged.

A person may or may not experience a brief loss of consciousness.

A person may remain conscious, but feel dazed.

A concussion may or may not show up on a diagnostic imaging test, such as a CAT Scan.

Skull fracture, brain bleeding, or swelling may or may not be present. Therefore, concussion is sometimes defined by exclusion and is considered a complex neurobehavioral syndrome.

A concussion can cause diffuse axonal type injury resulting in temporary or permanent damage.

A blood clot in the brain can occur occasionally and be fatal.

It may take a few months to a few years for a concussion to heal.

Contusion

A contusion can be the result of a direct impact to the head.

A contusion is a bruise (bleeding) on the brain.

Large contusions may need to be surgically removed.

Coup-Contrecoup

Coup-Contrecoup Injury describes contusions that are both at the site

of the impact and on the complete opposite side of the brain.

This occurs when the force impacting the head is not only great enough to cause a contusion at the site of impact, but also is able to move the brain and cause it to slam into the opposite side of the skull, which causes the additional contusion.

Diffuse Axonal

A Diffuse Axonal Injury can be caused by shaking or strong rotation of the head, as with Shaken Baby Syndrome, or by rotational forces, such as with a car accident.

Injury occurs because the unmoving brain lags behind the movement of the skull, causing brain structures to tear.

There is extensive tearing of nerve tissue throughout the brain. This can cause brain chemicals to be released, causing additional injury.

The tearing of the nerve tissue disrupts the brain's regular communication and chemical processes.

This disturbance in the brain can produce temporary or permanent widespread brain damage, coma, or death.

A person with a diffuse axonal injury could present a variety of functional impairments depending on where the shearing (tears) occurred in the brain.

Penetration

Penetrating injury to the brain occurs from the impact of a bullet, knife or other sharp object that forces hair, skin, bones and fragments from the object into the brain. Objects traveling at a low rate of speed through the skull and brain can ricochet within the skull, which widens the area of damage. A “through-and-through” injury occurs if an object enters the skull, goes through the brain, and exits the skull. Through-and-through traumatic brain injuries include the effects of penetration injuries, plus additional shearing, stretching and rupture of brain tissue. (Brumback R. (1996). Oklahoma Notes: Neurology and Clinical Neuroscience. (2nd Ed.). New York: Springer.)

The devastating traumatic brain injuries caused by bullet wounds result in a 91% firearm-related death rate overall. (Center for Disease Control. Firearms are the

single largest cause of death from traumatic brain injury.

Acquired Brain Injury

Acquired Brain Injury, (ABI), results from damage to the brain caused by strokes, tumors, anoxia, hypoxia, toxins, degenerative diseases, near drowning and/or other conditions not necessarily caused by an external force.

Anoxia

Anoxic Brain Injury occurs when the brain does not receive any oxygen. Cells in the brain need oxygen to survive and function.

Types of Anoxic Brain Injury

Anoxic Anoxia- Brain injury from no oxygen supplied to the brain
Anemic Anoxia- Brain injury from blood that does not carry enough oxygen

Toxic Anoxia- Brain injury from toxins or metabolites that block oxygen in the blood from being used
Zasler, N. Brain Injury Source, Volume 3, Issue 3, Ask the Doctor

Hypoxic

A Hypoxic Brain Injury results when the brain receives some, but not enough oxygen.

Types of Hypoxic Brain Injury

Hypoxic Ischemic Brain Injury, also called Stagnant Hypoxia or Ischemic Insult- Brain injury occurs because of a lack of blood flow to the brain because of a critical reduction in blood flow or blood pressure.

