



The Basics of Brain Injury

WHAT IS ACQUIRED BRAIN INJURY?

Acquired brain injury refers to damage to the brain that happens because of an event after birth. It does not refer to brain defects present at birth or to degenerative brain conditions such as Alzheimer's disease or Parkinson's disease.

CAUSES AND TYPES OF BRAIN INJURY

Generally, there are two types of brain injury: **traumatic** and **nontraumatic**.

*A **traumatic brain injury** is an injury caused by a force outside of the brain.*

Closed traumatic brain injury

This type of injury is the result of a blow to the head. The force of a strong blow will cause the brain to move or shake within the skull. The sharp and hard parts on the inside of the skull itself can cut and bruise the brain. It can happen in many ways such as the following:

- impact from a motor vehicle accident
- a fall
- when hit with a blunt object such as a fist or weapon

Sometimes the brain bounces against the sides of the skull resulting in more damage. This is called a **coup-contrecoup injury**.

Open traumatic brain injury

This type of injury happens when an object enters the brain through the skull, such as bullets, knives, debris from an explosion, or pieces of bone or metal. Damage to the brain tissue is seen mostly in one area—the area of penetration.

***Nontraumatic brain injuries** are caused by changes or problems within the brain itself. Some examples of this kind of injury are as follows:*

Spontaneous bleeding

Bleeding within the brain can happen due to weak or malformed blood vessels. Another term for bleeding is hemorrhage. This type of injury can happen with high blood pressure, arterial venous malformations or rare bleeding disorders.

Infections or metabolic disorders

There are many types of infections (which is when a virus attacks the brain) as well as metabolic disorders (caused by events such as an overdose of drugs, loss of oxygen due to heart and lung failure, or a sudden change because of the failure of a body organ).

Tumours

A tumour is an abnormal mass of tissue that can cause injury to the surrounding brain tissue. After surgery has removed the tumour, the surgical process may result in changes to the brain.

HOW BRAIN INJURY IS DIAGNOSED

When you or your family member is injured, the first questions that come to mind are, “How bad is it?” and “Will I be normal again?” This is difficult to answer because there is no way to predict how a person will recover. However, the severity of brain injury is based on the indices of neurological and neuroradiological tests. In the case of a traumatic brain injury (TBI) resulting in a coma, health practitioners gauge severity of that injury based on the Glasgow Coma Scale (GSC).

A coma is a state of unconsciousness lasting longer than an hour. Unconsciousness means no speech and no meaningful response to touching and talking.

Glasgow Coma Scale

The Glasgow Coma Scale is used in the emergency room and intensive care. It measures level of awareness, how bad the brain injury is, and coma level. This is used to rate the following:

- ability to open eyes
- ability to respond when asked to move
- ability to speak

Scores can range from a low of 3 to a high of 15. A score of 9 or more means the person is no longer in coma.

HOW BRAIN INJURY IS RATED

Brain injuries are rated by their severity at the time of the injury. Ratings range from mild to severe.

A concussion is a mild form of brain injury. In most cases those who have had a concussion exhibit the following physical signs:

- Loss/altered consciousness
- Vomiting
- Balance problems
- Slurred speech
- Seizure
- Personality changes
- Poor concentration
- Sleep disturbance
- Inappropriate emotions

Some individuals may have one symptom, some may have all. Having only one can still constitute a concussion.

Upon the patient's release from the hospital, the physician will give instructions on how to provide care and explain the symptoms or behaviour changes that should be reported to the hospital.

WHAT HAPPENS RIGHT AFTER THE INJURY

The fastest recovery tends to happen in the first six months after the injury. When other issues (such as other bodily injuries) are present, the recovery becomes more complicated. The pace of recovery tends to be slow, steady improvement with further smaller gains over time. Progress can feel a bit like riding a roller coaster. No one can be certain about the outcome of the journey of recovery or to what level of functioning the survivor will advance.

After the initial injury, there could be brain swelling (also called cerebral edema). In the days and weeks after injury, the tissue in the brain may swell or bleed. In some cases, small amounts of fluid are removed from around the brain to relieve the pressure in an effort to improve its functioning.



COMMON COMPLICATIONS FOLLOWING BRAIN INJURY

Here are some of the common complications that can happen as a result of a traumatic brain injury:

Increased intracranial pressure: This is when pressure inside the skull increases, affecting the brain tissue.

Edema: This is also called brain swelling, which happens when the brain contains more fluid than normal.

Hydrocephalus: This happens when there is too much water (cerebrospinal fluid) on the brain. If the condition becomes severe, doctors place a shunt in the brain to drain the fluid.

Low blood pressure: Blood carries oxygen to the brain. Low blood pressure means a decrease in blood flow to the brain.

Fever: Injury to the brain may cause high fevers especially in the first few hours or days after injury.

Pneumonia: Injury increases the risk of pneumonia; the doctors and nurses will make sure to monitor breathing and lungs.