Types of Brain Injury

The bones of your skull are hard and they protect your brain. Your brain is soft, like firm Jell-O. When your head moves, your brain moves inside your skull. When your head is hit or moved with force, your brain moves at a different speed than the skull. The brain can be bruised or parts may be stretched so much that damage occurs, called shearing. Bleeding can occur to cause other problems.

This is an overview of some types of brain injury. The signs of the type of brain injury will be noted as well as treatment options. Talk to your doctor or others on your health care team if you have specific questions.

Concussion

A concussion is the most common type of traumatic brain injury. It results from a fall or hit to the head that causes the brain to twist and turn inside the skull. A concussion may cause bruising, bleeding or swelling of the brain. A skull fracture may occur along with a concussion.

Signs of concussion:
- Brief loss of consciousness
- Feel confused
- Headache
- Nausea or vomiting
- Fatigue or tired with no energy
- Blurred vision
- Sleeping problems
- Memory loss
- Personality changes

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Learn more about your health care.
A concussion is normally not life-threatening, but it can be serious. If your signs get worse after 7 to 10 days, see your health care provider. You will be given an exam and tests, such as Magnetic Resonance Imaging (MRI), to check your health. Medicines may be used to treat dizziness or headache, but time is needed most for brain healing.

**Contusion**

Contusion means bruise, and it is another mild form of traumatic brain injury. When the head is hit, the brain moves back and forth inside the skull. When the brain is pushed up against the ridges and sides of the skull, bruising to the brain can occur.

Because a big force is needed to create a contusion, the person also may have other brain injuries. These could include bleeding inside the brain, skull fractures, or more than one contusion.

**Contusions can cause:**

- Brain swelling
- Coma
- Seizures
- Brain damage
- Higher pressure inside the skull

It often takes a long time for the person to recover from this injury. The location of the contusion and the amount of damage will impact recovery time.
Hematoma

A hematoma is a pool or collection of blood. It is a more moderate form of brain injury. Blood vessels in the head may be torn as a result of skull fractures or shearing injuries. More than one type of hematoma can occur. The hematoma may develop right after the head injury or later.

Types of hematoma:
- Epidural hematoma: Epidural means above the dura. The dura is the tough outer cover layer on your brain between your brain and your skull. The bleeding is between this layer and your skull.
- Subdural hematoma: Subdural is below the dura. The bleeding is between the brain and the dura layer.
- Intracerebral hematoma: Intra means inside and cerebral means brain. The bleeding is inside the brain tissue.

Hematoma can cause:
- Brain swelling
- Higher pressure inside the skull
- Coma

Treatment of hematoma:
Surgery may be done to remove the hematoma. Whether surgery is done depends on where the hematoma is and whether it is getting larger or causing any problems. Recovery depends on the seriousness of the injury and whether other brain injuries occurred with the hematoma.

Cerebral Hemorrhage

This means bleeding in the brain. It can be a moderate to severe form of brain injury. The site of the bleeding is used to name the type of hemorrhage.
- Subarachnoid hemorrhage: bleeding over the outer surface of the brain.
- **Intraventricular hemorrhage:** bleeding into the fluid filled chambers of the brain, called ventricles. In this type of hemorrhage, the cerebrospinal fluid (CSF) becomes blood tinged.

- **Intracerebral hemorrhage:** bleeding into the brain tissue.

**Signs of hemorrhage:**
- Sudden severe headache
- Change in wakefulness
- Nausea and vomiting
- Irritable
- Restless
- Light hurts eyes

Surgery and medicines are the most common treatments. Recovery depends on how severe the bleeding is and whether there are problems from the bleeding.

**Diffuse Axonal Injury (DAI)**

This injury happens when the brain's nerves are stretched or torn. This most often happens from a blow to the head that causes the brain to slide back and forth inside the skull. Damage from this injury may be widespread throughout the brain. When the nerves are torn, they die. Your doctor may describe the injury as moderate to severe brain injury.
Some of the signs seen with this injury include:

- Loss of consciousness, called a coma
- Abnormal movement of the arms and legs
- Higher pressure in the brain, called intracranial pressure
- High blood pressure
- High body temperature

The recovery process can take a long time. The person with this injury may be in a coma for months.

**Anoxia (An-ox-ee-a)**

A lack of oxygen to all or part of the brain is called anoxia. Any injury to the blood flow of the brain can cause a decrease in the oxygen to the brain. The brain does not store extra oxygen and is very sensitive to changes in the oxygen level. Heart attack, stroke, drowning, or injuries where a large amount of blood is lost can cause anoxia.

**Signs of anoxia may include:**

- Memory loss
- Higher pressure in the brain, called intracranial pressure
- Loss of consciousness

**Treatment of anoxia includes:**

- Supporting breathing and blood pressure
- Giving medicine to reduce brain swelling
- Treating the cause of anoxia, if possible

Whether or not there are serious, long lasting effects from anoxia of the brain depends on how long and how much the oxygen supply was blocked from the brain. Anoxia can result in no lasting effects or there may be other problems such as:

- Minor loss of function
- Changes in behavior
- Problems with speech
- Seizures
- Long term coma
- Brain death

Talk to your doctor or others on your health care team if you have any questions. You may request more written information from the Library for Health Information at (614) 293-3707 or email: health-info@osu.edu.