

## Hemiplegia in Children

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**Hemiplegia** /hem-i-ple-gi-a/ is derived from the Greek words hemi (half) and plegia (paralysis), and means total paralysis of one side of the body, including the face, arm and leg. The term *hemiparesis*, used interchangeably with hemiplegia, is defined as weakness on one side of the body. *Congenital or infantile hemiplegia* refers to brain injuries that occur before or at birth and lead to hemiplegia.

Hemiplegia is the physical manifestation of an injury to a specific area of the brain that controls motor function. Hemiplegia may develop suddenly, or evolve over days, weeks or months. In addition, some infants who appear normal in the newborn period may show symptoms of hemiplegia only after voluntary hand use develops, at about 4-5 months of age. Hemiplegia can also be short-lived or permanent.

There are several areas within the brain where an injury can lead to hemiplegia. These include the motor cortex area of the frontal lobe, centrum semiovale, internal capsule, cerebral peduncle and the pons region. Each area of the brain has special functions and areas of the brain also work together. The left cerebral hemisphere controls the right side of the body and the right cerebral hemisphere controls the left side of the body. Thus an injury to the right side of the brain can lead to weakness on the left side of the body or left-sided hemiplegia.

Hemiplegia in children is due to a number of different causes and includes blood vessel disorders (stroke), infection, trauma, tumors and other rare causes. The most common cause of hemiplegia is due to a stroke or vascular disorder. Stroke is due to a problem with one of the blood vessels in the brain.

The circulatory system is like a pumping system with a pump (heart), pipes (blood vessels) and fluid (blood). Blood vessels carry blood and oxygen to the brain. A stroke occurs when there is an insufficient amount of blood and oxygen to the brain. This can be due to a breakdown in the pump (heart disorders), a blockage or break in one of the pipes and or a problem with the blood. A blockage in the blood vessel leads to a decreased amount of blood and oxygen to that area of the brain and causes the tissue to die.

The piping system in the brain consists of many different blood vessels or arteries. The blood vessel that is most commonly blocked or affected is the *middle cerebral artery*. The middle cerebral artery is the largest of the branches of the internal carotid artery, the large artery in the neck. The middle cerebral artery transports blood and oxygen to areas in the brain that among other things controls motor function. Thus a blockage in the middle cerebral artery typically leads to hemiplegia.

Infections can also cause hemiplegia. Infections can penetrate into the brain and injure the tissue that controls motor function. Trauma to the head can cause damage to the underlying brain tissue and may lead to the development of hemiplegia. Tumors increase in size over time and may compress the area of the brain that controls motor function and produce hemiplegia.

Further research is needed in childhood stroke and other disorders that cause hemiplegia in children. Studies are needed to identify risk factors and determine the best treatment and prevention of hemiplegia in children.