

## What is a Spinal Cord Disability?

To understand spinal cord disabilities, it is important to first understand a few things about the nervous system. The nervous system is divided into two parts, the central nervous system and the peripheral nervous system.

The **central nervous system** consists of the brain, the spinal cord, and the optic nerves (that allow vision). The **brain** is the control center of the body, made up of four lobes, frontal, temporal, parietal, and occipital, the cerebellum and the brain stem. Each serves a different part of controlling your body and mind.

The **spinal cord** is a bundle of nerves and fibers, about the thickness of a finger, that transmits messages to and from the brain. It attaches to the brain at the brain stem and extends to the lower back. The spinal cord is protected by the 33 vertebrae or 'back bones' that make up the spine. The spinal cord connects to the peripheral nerve system through the spinal nerves or nerve roots that come off the spinal cord and pass out through a hole in each of the vertebrae called the Foramen. Each vertebrae has a name and number.

All other nerves in the body are part of the peripheral nervous system. These nerves can be motor, sensory, or autonomic nerves. Motor nerves are involved in transmitting messages from the brain. Sensory nerves are involved in transmitting messages to the brain. The autonomic nerves control the automatic functions of the body, such as breathing and digestion.

The central and peripheral systems work together to allow for the functions of life. While the peripheral nerves transmit messages in the form of electrical impulses between the body and the spinal cord, the spinal cord transmits messages between the peripheral nerves and the brain. For example, if a person puts his hand near a flame, a sensory nerve, which is part of the peripheral system, transmits the "hot" message to the spinal cord. The spinal cord then sends the message to the brain, where it is interpreted. The brain then sends a message down the spinal cord to the motor nerves to tell the muscles to pull the hand away from the flame.

A spinal cord disability occurs when there is damage to the spinal cord, resulting in the body's loss of the ability to transmit messages to and from the brain. While some peripheral nerves and body parts can regenerate and repair themselves, the spinal cord cannot. As a result, there can be a permanent loss of function, often causing loss of sensation or inability to feel and paralysis, the inability to move, as well as many other messages that control the body.

There are many causes of damage to the spinal cord. The three main causes are traumatic injuries, birth defects, and disease processes.

When a person sustains a spinal cord disability, many functions can be affected. While bladder, bowel, and sexual functions are affected in almost all spinal cord disabilities, the other effects depend on both the extent of the injury and the level of injury. Spinal cord disabilities can be either complete or incomplete. In a complete disability, the spinal cord loses the ability to

transmit messages from below the place of injury. In an incomplete disability, at least one message can be transmitted from below the point of the injury, resulting in the retention of some sensation or movement, which may or may not be useful or functional. By level of injury, we mean the vertebral level of the spinal cord where the injury occurred. If an injury affected the cervical areas, say C5, then the person probably has tetraplegia and has lost sensation and experienced paralysis in both his arms and legs at the C5 level and below. If the injury affected the thoracic, sacral, or lumbar region, the person probably has paraplegia and has lost sensation and experienced paralysis in his legs and lower body. Thus, an injury at the T8 vertebra level will result in loss of sensation and paralysis at the T8 level and below.