

About Spinal Cord Injury

More than 200,000 individuals in the United States today have spinal cord injuries (SCI). Every year, approximately 10,000 more sustain SCI from auto, sports and work accidents, falls, or during military service.

A Spinal Cord Injury changes an individual's life in an instant - physically, emotionally and socially. Whether you are newly injured or have lived with your injury for some time, you will have many concerns and questions.

When a person receives an SCI, the communication between the brain and other parts of the body is disrupted, and messages no longer flow past the damaged area. The extent of the communication breakdown is dependent on both the severity and location of the injury. The human spinal cord is a bundle of nerve cells and fibers approximately 17 inches long that extends from the brain to the lower back. The spinal cord carries messages from the brain to all parts of the body and receives incoming messages from the body as well.

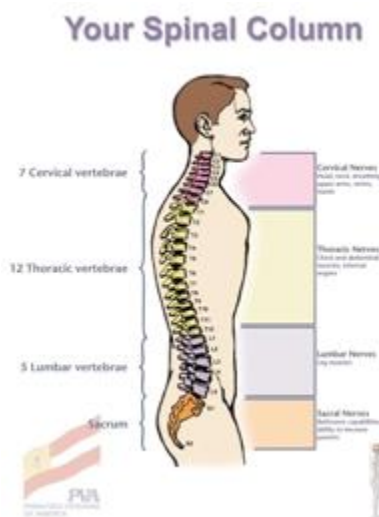
The nerves that lie only within the spinal cord itself are called upper motor neurons (UMNs). These run only between the brain and the spinal nerves. The spinal nerves branch out from the spinal cord into the tissues of the body. Spinal nerves are also called lower motor neurons (LMNs). In movement, the brain sends messages through the spinal cord (UMNs) to the spinal nerves (LMNs). The LMNs then carry these messages to the muscles to coordinate complicated movements such as walking. In this way, the brain can influence movement.

The cord is protected by the backbone, which is made up of 33 individual vertebrae. These vertebrae have different names depending on their location.

There are: (Click on picture to download full size)

- 7 cervical vertebrae located in the neck
- 12 thoracic vertebrae in the upper back
- 5 lumbar vertebrae in the lower back
- 5 fused sacral vertebrae in the hip area
- 4 fused vertebrae in the coccyx (tailbone)
- Download a picture detailing vertebrae location

Spinal cord injuries can occur at any level of the spinal cord, and the level of the injury will dictate which bodily functions are altered or lost. Damage to the spinal cord can cause changes in movement, feeling, bladder control, or other bodily functions. How many changes there are depends on where the spinal cord was injured and how severely the spinal cord was injured. The



main problem is that the connection between the brain and the parts of the body below the injury is impaired. A spinal cord injury is named for the lowest level of the spinal cord that still functions the way it did before injury.

Most spinal injuries damage both UMNs and LMNs. A complete injury cuts or squeezes all the UMNs running down the spinal cord. In a UMN injury, control by the brain no longer exists because messages from the brain can't get through the point of injury. The LMNs act by themselves, causing reflexes without limit. One example is spasticity. Spasticity is the uncontrolled movement of the arms or legs. LMN injuries are a different story. This kind of injury is found, for the most part, at the lower tip of the spinal cord, or the cauda equina.

Spasticity is not found in LMN injuries as it is in UMN injuries, because muscles governed by these LMNs tend to shrink or atrophy. Stated simply, a UMN injury is one where the UMN pathway is broken, and the LMNs below the injury are intact and spasticity is noted. An LMN injury, usually at the cauda equina, abolishes nerve contact with muscles controlled below the injury and no spasticity develops.

Recovery

Immediately after a spinal cord injury, the spinal cord stops doing its job for a period of time called "spinal shock." The return of reflexes below the level of injury marks the end of spinal shock. At this time, a doctor can determine if the injury is complete or incomplete. If the injury is incomplete, some feelings and movement may come back.

Rehabilitation begins immediately. The individual will be instructed in strengthening exercises, new styles of movement, and the use of special equipment. If additional recovery of feeling or movement does not occur, a rehabilitation team will help the individual to develop new goals.