About Spinal Cord Injuries

What does the Spinal Cord do?

The central nervous system has two parts: the brain and the spinal cord. The spinal cord carries messages to and from the brain to other parts of the body such as muscles, joints and organs.

The spinal cord tells the brain about pain, temperature, and touch. For instance, when a hand is placed near a hot flame, nerve endings in the hand feel the heat and send the message along the nerve fibers to the spinal cord and up to the brain.

The spinal cord also carries messages from the brain to parts of the body that control movement, posture, muscle tone, and reflexes. This allows us to do things such as walk, sit, or throw a ball. An injury to the spinal cord can disrupt these functions. The picture on the next page shows what part of the spinal cord controls what part of the body.
Treatment

When you first have a spinal cord injury, surgery may be used to relieve pressure on the spinal cord. The goal is to repair or stabilize broken bones (fractures) or dislocations. A small piece of bone from part of the body, like the hip, or other material may be used to mend the damaged area. This is called a “fusion.”

Collars, tongs, traction or braces are often used to stabilize the spinal column whether or not surgery is needed. You can learn more about bracing in another section of this binder.

Coping after a Spinal Cord Injury

A spinal cord injury is a very overwhelming event. People who are newly injured will often have health problems. It also takes time to build up enough strength to fully involve yourself in daily activities. You will likely have many thoughts and feelings after your injury. Some thoughts seem extreme and others mild. People who are newly injured often feel grief. This is a time of mourning that can be like the death of a loved one. You are grieving the loss of touch, and maybe the loss of being able to walk or use your hands. There is no step-by-step way of getting through this time. Denial, disbelief, sadness, anger, depression and bargaining are thoughts and feelings that are common.

Adjusting is a process that will involve many steps. Your motivation, the support of family and friends, and knowing more about your injury will help you along the way. People with spinal cord injuries and their loved ones often find Health Psychology staff helpful. Health psychologists are part of your health care team that will follow you during your hospital stay. They may be needed after you leave. Please ask the staff to contact them for their help at any time. You can learn more about support groups, stress management and similar topics in another section of this binder.
Neurological Level of Injury

Injury to the spinal cord can occur from a traumatic injury, disease or infection. The cord may become pinched, bruised, swollen or torn. How your body works after injury depends on where or what level of the spinal cord was injured. After injury, all of the nerves above the level of injury will continue to work as normal. The function of the nerves below the injury will be changed or lost.

The spinal cord is surrounded and protected by bones called vertebrae. The vertebrae and spinal cord are split into sections, listed below.

- Cervical ("C") = neck
- Thoracic ("T") = chest and upper back
- Lumbar ("L") = low back
- Sacral ("S") = hips and pelvis

Each section has a certain number of levels and each level controls specific body functions. (See picture below).
Complete and Incomplete Spinal Cord Injuries

A **Complete Spinal Cord Injury** means there will be loss of all voluntary movement below the point of injury. Nerve damage blocks all signals from the brain to the body parts below the injury.

**Complete Quadriplegia or Tetraplegia**
- If you have a complete injury in your neck (cervical) level of the spinal cord, this will cause the loss of muscle movement (paralysis) and/or the loss of feeling in your neck, arms or trunk and below.

**Complete Paraplegia**
- If you have a complete injury in your chest or upper back (thoracic), low back (lumbar), or hips or pelvis (sacral) level of the spinal cord, this will cause loss of muscle movement (paralysis) and/or the loss of feeling in your legs and lower parts of your body.
- There will still be movement and feeling in the arms.

Some loss of sexual function and problems with going to the bathroom may also occur. The paralysis after a complete injury is almost always permanent.

An **Incomplete Spinal Cord Injury** means the spinal cord was not totally damaged. This results in some loss of movement and sensation below the area of injury. The amount of movement or sensation that is lost is different for each person.

- An incomplete injury will at least affect the lowest part (sacral level) of the spinal cord
- There may be some loss of sexual function and problems with going to the bathroom.

Some of the effects of incomplete injuries can be reversed with treatment and time. All people have different patterns of recovery. The return of motor function can occur up to 18-24 months after an injury. Early return of movement in the arms and/or legs (within two weeks of injury) is the best sign of long-term recovery.
American Spine Injury Association (ASIA) Impairment Scale

The American Spine Injury Association (ASIA) created a scale that categorizes spinal cord injuries. Complete injuries are called “A”. Incomplete injuries are called “B”, “C” or “D”, depending on the specific injury.

A = Complete: No movement ability, strength or sensation is present below the level of injury, including the lowest level of the spinal cord (S4-S5).

B = Incomplete: Sensation is present but no movement ability or strength is present below the level of injury, including the lowest level of the spinal cord (S4-S5).

C = Incomplete: Sensation and movement ability are present below the level of injury. More than half of the muscles below the level of injury are very weak and cannot fully move against the force of gravity.

D = Incomplete: Sensation and movement ability are present below the level of injury. At least half of the muscles below the level of injury can fully move against the force of gravity.

E = Normal: Sensation and movement ability are normal.

Vertebral Sections and Numbers

- Cervical
- Thoracic
- Lumbar
- Sacral
- C-1
- C-7
- T-1
- T-7
- T-12
- L-1
- L-5
- Cocygeal
My Spinal Cord Injury

Your injury is named with a letter and number. This is partly based on where you have normal muscle movement and feeling on both sides of the body.

The letter relates to the section of the spinal cord that was injured (cervical, thoracic, lumbar or sacral). The number indicates the specific level of vertebrae in that section. For example, a “C5” injury means the injury occurred at the fifth cervical (neck) vertebrae.

**My injury is:** □ Complete Injury  OR  □ Incomplete Injury

**My level of injury and ASIA Scale:** ____________________
Spinal Cord Syndromes

Some people have a syndrome that affects the spinal cord. These may or may not apply to you. You can ask your doctor, therapist or nurse if you have questions.

<table>
<thead>
<tr>
<th>Spinal Cord Syndromes</th>
<th>Things to Know</th>
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<tbody>
<tr>
<td>Central Cord Syndrome</td>
<td>• Caused by injury to the spinal cord in the neck</td>
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<td></td>
<td>• Greater weakness and loss of sensation in the arms and trunk than in the legs</td>
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<td>• Bladder function may be affected</td>
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<tr>
<td>Anterior Cord Syndrome</td>
<td>• Caused by loss of blood supply to the front half of the spinal cord in the upper back (thoracic) region</td>
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<td>• Results in various degrees of paralysis and loss of touch, pain and temperature sensation below the level of injury</td>
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<tr>
<td>Brown-Sequard Syndrome</td>
<td>• Caused by injury to the left or right side of the spinal cord</td>
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<td>• Loss of movement on the same side as the injury</td>
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<td></td>
<td>• Loss of feeling on the opposite side from the injury</td>
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<td></td>
<td>• Bladder and bowel function may be affected</td>
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<tr>
<td>Cauda Equina Syndrome</td>
<td>• Caused by injury to the lower (lumbar) segment of the spinal cord</td>
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<td>• Partial or full loss of movement and/or feeling of the lower legs, ankles, and feet</td>
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<td>• Bladder and bowel function may be affected</td>
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<tr>
<td>Conus Medullaris Syndrome</td>
<td>• Caused by injury to the lowest (sacral) part of the spinal cord</td>
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<td></td>
<td>• Partial or full loss of movement and/or feeling in the feet and some parts of the legs</td>
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<tr>
<td></td>
<td>• Bladder and bowel function may be affected</td>
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Your health care team may have given you this information as part of your care. If so, please use it and call if you have any questions. If this information was not given to you as part of your care, please check with your doctor. This is not medical advice. This is not to be used for diagnosis or treatment of any medical condition. Because each person’s health needs are different, you should talk with your doctor or others on your health care team when using this information. If you have an emergency, please call 911. Copyright © 12/2016 University of Wisconsin Hospitals and Clinics Authority. All rights reserved. Produced by the Department of Nursing. HF#7583