



Spinal Cord Injury

Symptoms or Behaviors

The most common issue after a spinal cord injury is loss of function such as mobility or feeling. Individual symptoms vary with the location of the injury.

Possible complications associated with spinal cord injury include:

- Skin breakdown (as a result of excessive pressure from immobilization)
- Osteoporosis and fractures (as a result of the lack of weight-bearing exercises)
- Pneumonia, aspiration (restriction in respiratory function, termed restrictive lung disease)
- Respiratory dysfunction
- Spasticity
- Autonomic dysreflexia (resulting in dangerously high blood pressure)
- Orthostatic hypotension (a drop in blood pressure)
- Cardiovascular disease
- Neuropathic (nerve generated)/spinal cord pain
- Bowel management difficulties
- Urinary tract problems
- Deep vein thrombosis and pulmonary embolism
- Weight control issues
- Thermo-regulation issues

About the Disorder

A spinal cord injury (SCI) usually begins with a sudden, traumatic blow to the spine that fractures and dislocates vertebrae. The damage begins at the moment of injury when displaced bone fragments, disc material, or ligaments bruise or tear into spinal cord tissue. The injury causes fractures and compression of the vertebrae which then crush and destroy the axons (extensions of nerve cells that carry signals up and down the spinal cord between the brain and the rest of the body), disrupting that communication so that messages no longer flow past the damaged area. This may result in loss of function such as mobility or feeling. Besides an injury, spinal cord damage can also occur from such diseases as polio, spina bifida, or Friedreich's Ataxia.

The extent of the communication breakdown is dependent on the severity and location of the injury. The spinal cord does not have to be severed for a loss of functioning to occur. Spinal cord injuries are classified as either complete or incomplete. A complete injury means that there is no function below the level of the injury, no sensation, and no voluntary movement. Both sides of the body are affected. An incomplete injury means that there is some functioning below the primary level of injury. A person with an incomplete injury may be able to move one limb more than the other, may be able to feel parts of the body that cannot be moved, or may have more functioning on one side of the body than the other.

The level of injury is helpful in predicting what parts of the body might be affected by paralysis and loss of function. In general, the higher in the spinal column the injury occurs, the more dysfunction a person will experience. The eight vertebrae in the neck are called the cervical vertebra. The top is C-1, the next is C-2, etc. Cervical SCIs usually cause loss of function in the arms and legs, resulting in quadriplegia, and injuries above the C-4 level can result in the loss of many involuntary functions including the ability to breathe, necessitating the use of a ventilator or breathing aids. The twelve vertebrae in the chest are called the thoracic vertebrae. Injuries in the thoracic region usually affect the chest and the legs and result in paraplegia. The vertebrae in the lower back are the lumbar vertebrae, and the five sacral vertebrae run from the pelvis to the end of the spinal column. Injuries to these lower vertebrae generally result in some loss of functioning in the hips and legs, as well as trunk control and abdominal muscle control. Besides the loss of sensation and motor functioning, individuals with SCI also may experience dysfunction of the bowels and bladder, sexual dysfunction, low blood pressure, inability to regulate blood pressure effectively, reduced control of body temperature, inability to sweat below the level of injury, and chronic pain.

There are about 10,000 new SCIs every year; the majority of them (82%) involve males between the ages of 16 and 30.

Educational Implications

After a SCI, the child and his/her family will need support and understanding as they struggle with the implications of the injury. Extensive medical treatment, evaluation, and rehabilitation will be involved, resulting in the child's absence from school. After injury there will likely be a period of hospitalization, followed by clinic and rehabilitation appointments.

When the child returns to school, his/her loss of function will determine the extent and amount of educational accommodations and services that will be required. It is important that school staff be knowledgeable about the student's injury and recovery, as well as his/her functional ability and independence. The teacher may want to contact the student's parents to obtain the following information before the student returns to school:

- Specific injury and effects, if any, on the child's functioning
- Any medications or specialized procedures, when it is administered, what potential side effects are
- Approximate schedule of upcoming appointments that may result in the child's absence
- Limitations, if any, on the child's activities (with periodic updates)
- What the child knows about the injury and related emotional needs
- For younger children, what the family would like classmates and school staff members to know
- For adolescents, whether the student wishes to talk directly with teachers about any of the above points
- For adolescents, whether the student is able to take responsibility for his/her own health concerns

Research supports the importance of physical exercise, regardless of functional capabilities. Based on the nature of the injury, individuals with SCI can participate in almost all physical activities with modifications.

Instructional Strategies and Classroom Accommodations

- Environmental modifications for greatest mobility and independence
- Curriculum modifications (extra time for assignments, modified time limits, alternative ways to receive information, alternative ways to evaluate)
- Alternative note-taking methods, provision of teacher outlines
- Absences may require repeated instruction, modified requirements as noted above
- Tutorial services/homebound instruction when necessary
- Emotional support (counselor, school social worker, or psychologist) for assistance in dealing with implications of loss of function
- Assistance in learning adaptive techniques to accomplish educational tasks
- Assistive technology as necessary

Resources

Christopher Reeve Paralysis Foundation/Paralysis Resource Center

500 Morris Ave
Springfield MJ 07081
info@crpf.org; research@crpf.org
<http://www.christopherreeve.org>
Tel: 973-379-2690; 800-225-0292
Fax: 973-912-9433

National Spinal Cord Injury Association

6701 Democracy Blvd
#300-9
Bethesda, MD 20817
NSCIA2@aol.com
<http://www.spinalcord.org>
Tel: 301-214-4006; 800-962-9629
Fax: 301-8819817

National Institute of Neurological Disorders and Stroke

http://www.ninds.nih.gov/health_and_medical/disorders/sci.htm

Spinal Cord Injury Information Network

<http://www.spinalcord.uab.edu/show.asp?durki=19679>

Spinal Cord Injury Resource Center

<http://www.spinalinjury.net/index.html>

Paralyzed Veterans of America (PVA)

801 18th St NW
Washington DC 20006-3517
info@pva.org
Tel: 202-USA-1300; 800-424-8200
Fax: 202-785-4452