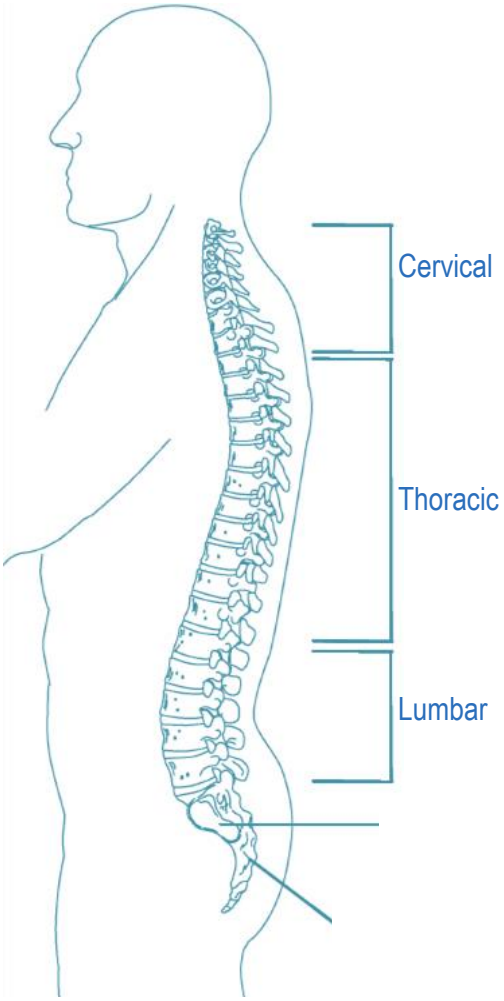
Spinal Cord Injury

Spinal Cord Essentials

A spinal cord injury is damage to your spinal cord that affects your movement, feeling, or the way your organs work. The injury can happen by cutting, stretching, or swelling of the spinal cord. Injury can also be caused by viruses, tumors, or stroke. Every spinal cord injury is different. Symptoms and recovery depend on where it happened and how severe it is. After a spinal cord injury, most people recover some function. The amount of recovery depends on a lot of factors.



What is the Spine?

Your spine is your back bone. It's a column of bones and cartilage that protects your spinal cord**.** The spine is made up of 33 bones called vertebrae. These vertebrae are named according to their location in your body.

Neck: 7 cervical vertebrae (C1-C7)

Upper/mid back: 12 thoracic vertebrae (T1-T12)

Lower Back: 5 lumbar vertebrae (L1-L5)

Pelvis: 5 fused sacral vertebrae (S1-S5)

Tailbone: 4 fused vertebrae of the coccyx

What is the Spinal Cord?

The spinal cord is a bundle of nerve cells and fibres that connect your brain to your body. It runs through a hole in your spine from your neck to your lower back. Your spinal cord is continuous with your brain. At each vertebra, spinal nerves branch out. Spinal nerves connect with your skin, muscles, and organs. Each one has a specific function. It is through your spinal cord that your brain speaks and listens to your skin, muscles, and organs.

Contact your Doctor or Nurse for more information.	MEDICAL
	www.SpinalCordEssentials.ca SCE2-Ga1-2015-11-17

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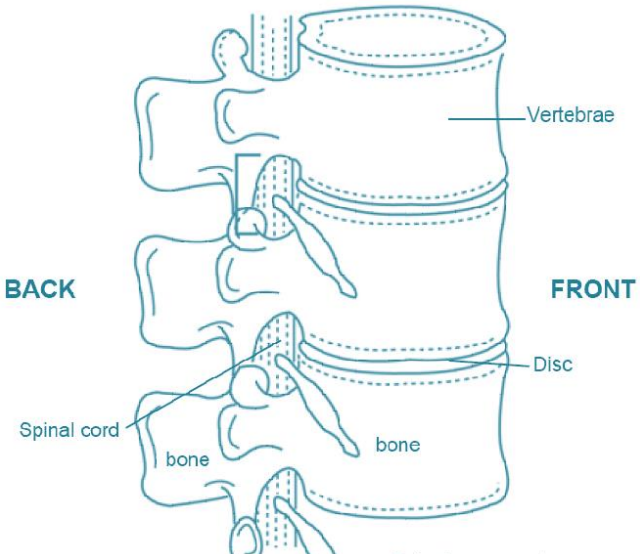
Your spinal cord is about 45 cm (1.5') long and weighs only about 35g (1.2oz). It is as thick as your pinky finger and has about one billion nerve cells. It has both nerve cells and nerve fibers. Some nerve fibers travel a long distance from the brain before ending in your spinal cord. When nerve fibers are damaged, it is very difficult to heal them.



What is a Spinal Cord Injury?

A spinal cord injury is damage to the spinal cord that causes loss of function. This can include movement and feeling (sensation). Spinal cord injury can affect the movement of your hands, arms, and legs. It can also affect your organs involved with bowel, bladder, and sexual function. Damage to the spinal cord can be caused from trauma or from non-traumatic causes.

Traumatic Injury: Spinal cord injury can be caused by direct injury. Traumatic injuries are caused from falls, car crashes, sports injuries, or other accidents.

Non-traumatic Injury: When injuries are not caused by direct physical injury, they are called non-traumatic. This can happen because of an infection, tumour, stroke, or disease.

Traumatic Injury	Non Traumatic Injury
Broken bones in your neck or back	Swelling
Cutting or piercing of the spinal cord	Tumor
Dislocation – bones shifting out of position	Bleeding or blocked vein/artery
Ligament injuries and tears	Viruses or bacteria (e.g. tuberculosis)

What is Your Level of Injury?

Your level of injury is the lowest level of your body that has normal feeling and strength. Below your level of injury, you have weak or no connections between your brain and your

body. Most of the time, your level of injury is different from your injured vertebra. This is because your spinal nerves come out above and below your vertebrae. Bleeding and swelling above and below the affected vertebra bones can also cause more damage.

Paraplegia (T2 to S5): People with paraplegia have weak or paralyzed legs due to a back injury. Some or all of the leg muscles are weak or paralyzed but arms and hands have normal function. Abdomen and chest muscles can also be affected. Often, bowel, bladder, and sexual function are also affected.

Tetraplegia (Quadriplegia, C1 to T1): People with tetraplegia have the same weakness as people with paraplegia. Since the injury is in the neck, they also have weakness in their arms, hands, and fingers. With higher injuries, breathing and swallowing can also be affected.

Spinal Nerve	Muscle or Joint	Function
C1-C2	Tongue, neck, throat	Neck movement, swallowing
C3	Diaphragm	Breathing
C4	Diaphragm, trapezius	Breathing, shrug
C5	Biceps, shoulder	Bend elbow, lift arm
C6	Wrist	Bend wrist towards back of hand
C7	Triceps	Straighten elbow
C8	Index, thumb, middle finger	Grabbing objects
T1	Pinky, ring finger	Finger movement
T2-T12	Chest, abdominal	Posture, sitting upright
L1-L2	Hip	Lift leg
L3-L4	Knee and ankles	Walking
S1	Leg, toes, anus, bladder	Walking, bladder, bowel function
S2-S5	Anus, bladder, genitals	Bladder, bowel, sexual function

Your body may change over time. Let your doctor know right away if you notice any loss of movement or feeling.

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How Severe is Your Injury?

How severe your injury depends on how much damage was done to the spinal cord. The most severe is when the cord is fully cut or damaged. The American Spinal Injury Association (ASIA) has a guide for how severe your injury is. A doctor can test you to find out your ASIA Impairment Scale (AIS). Your AIS can improve during recovery.

Complete Injury (AIS A): If you don't have feeling or movement in your rectum or anus, you have a complete injury. This is because the spinal cord's furthest connections control your genitals and anus. A complete injury does not mean that the cord was cut fully. It means that a connection is missing between your brain and the end of the cord. A complete injury is AIS 'A'. In some cases, there is some spared movement or feeling for several segments below the level of injury. This is called a 'zone of partial preservation'.

Incomplete Injury (AIS B-D): With an incomplete injury, some connections are still present below your level of injury. This means that you will have some feeling and movement below the level of your injury. For your injury to be incomplete, you must at least have feeling or muscle activity in your anus or rectum. If this is the case, your injury is at least AIS 'B'. If you also have weak movement below the area of your injury, your injury is AIS 'C'. If your movement is stronger but still not normal, your injury is AIS 'D'. Normal strength and feeling is classified as AIS 'E'.

ASIA Impairment Scale (AIS)

A scale that scores how much movement or feeling you have below your level of injury.

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AIS	Type	Description
A	Complete Injury	No feeling or movement.
B	Sensory Incomplete	Some feeling but no movement.
C D	Motor Incomplete	Some feeling and movement. AIS D has more movement than AIS C.

E	Normal	Full movement and feeling.

What Kind of Recovery Can You Expect?

Most of your recovery happens during the first year after your injury. Some people might gain a little more recovery for up to 2 or 3 years after the injury. Your recovery from spinal cord injury depends on many things. Your age, type of injury, and other medical conditions all affect your recovery. The time and effort you put into your recovery can also play a role.

Recovery from spinal cord injury can mean getting stronger and getting feeling back. Recovery can also mean learning how to live with your injury. Many people don't have a full recovery. Your body might no longer function exactly like it did before the injury. You might need to learn new ways to do the things you could do before your injury.

Will You Walk Again?

Recovery of strength is higher in people with some movement right after the injury (AIS 'C' and 'D'). Most people get some improvement in movement or feeling. Some people do learn to walk again if a lot of spine connections are still there. Talk to your doctor about your recovery. They will help you understand what you can expect.

Advances in research are happening every day. During your recovery, stay healthy. When new treatment becomes available, your body will be in a good condition to receive them.