FACT SHEET

Understanding Spinal Cord Injury

By Kylie Wicks
CNC Continence/Spinal Clinical Programs Manager

This fact sheet is aimed at helping you understand about the spinal cord and what it means to have a spinal cord injury.

Basic information is provided to explain some of the terms you may hear during your time in hospital. The fact sheet provides links to further resources that may help your learning.

What is the spinal column?

The spinal column (or spine) is a structure made up of bones (vertebrae), nerves and ligaments. It provides support for the body and protects the spinal cord.

There are 33 vertebrae that run from the base of the skull, and end at the tailbone. They are stacked together and held together by disks, ligaments and muscles. The spinal column is categorised into sections, which are named, and each vertebra is numbered. There are:

- **7 cervical** vertebrae in the neck
- **12 thoracic** vertebrae in the upper back
- **5 lumbar** vertebrae in the lower back
- **5 sacral** vertebrae that are joined together to form the **sacrum** and
- **4 coccygeal** vertebrae that are also fused together to form the **coccyx**

Each vertebrae is referred to by their name and number, so that the cervical vertebrae are C1–C7. 'C' stands for cervical and the number is the position counting downwards from the head. The thoracic vertebrae become T1–T12 and the lumbar vertebrae are L1–L5.

What is the spinal cord?

The spinal cord allows your brain to communicate with your body by sending 'messages' through the nerves. The spinal cord runs from your brain down the inside of your spinal column and is made up of millions of nerve fibres. At each vertebra nerves branch out to send and receive information to and from different parts of the body. Both the nerves and the vertebra are numbered in the same way.

Messages are sent from the brain down the spinal cord to control every function of the body, some of which are under our control (Somatic Nervous System) and others happen without us knowing (Autonomic Nervous System).

The autonomic nervous system's main function is to maintain a stable environment within the body and it controls the automatic, involuntary functions. Some functions include blood flow around the body, heart function, breathing, body temperature and some aspects of bladder and bowel function. If you have damaged your spinal cord you probably have damaged your autonomic nervous system. More information regarding this can be found in fact sheet "Autonomic Dysreflexia" and fact sheet "Other Conditions You May Hear About" in this series.

When Spinal Cord Injury Affects YOU – Fact Sheet No 1 – Understanding Spinal Cord Injury

A ParaQuad NSW Project – in consultation with State Spinal Services & funded by the Lifetime Care & Support Authority

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What is a spinal cord injury?

A spinal cord injury can occur through a break, crush, rip or tear or can be through a disease such as a growth on the spine. An injury can disrupt blood and oxygen supply to the spinal cord. This disruption can result in spinal cord damage, sometimes called "nerve death". This damage will result in altered or blocked communication between the brain and the nerves.

The point on the spinal cord where the nerves are damaged is known as your **level of lesion** or **level of injury.** Your brain may have difficulty sending messages to parts of your body below the level of your injury and this will relate to how 'complete' your injury is.

Description of terms:

No two spinal cord injuries are the same. Each person's spinal cord injury will have a different degree of damage to the spinal cord than someone else's. You may hear the term 'tetraplegia', 'paraplegia', 'complete', 'incomplete', and be given an 'ASIA classification' to help grade the type and degree of damage. These terms are described so:

Tetraplegia (or Quadriplegia) is the injury or damage to the spinal cord in the cervical region (neck) and will result in partial or complete paralysis of the upper and lower portion of the body. These terms mean exactly the same thing, one is a Greek term and the other is Latin.

Paraplegia is the injury to the spinal cord below the neck (below T1) and will result in partial or complete paralysis of the lower portion of the body including the legs, and at times the torso.

A **Complete** injury means, in most cases, messages are unable to travel past the level of injury or there is total blockage of messages. Traditionally, it results in total loss of movement and sensation below the level of lesion. As medical advances improve, this terminology is becoming less commonly used.

An **Incomplete** injury means there is partial blockage and a degree of movement and/or sensation that can be communicated past the level of lesion. The degree of 'blockage' may be given an 'ASIA classification' or be called one of the terms listed under 'clinical syndromes'.

ASIA – As well as being determined as 'complete' or 'incomplete' a spinal cord injury may have been given a classification of injury according to the American Spinal Injury Association (ASIA) Classification as either ASIA A, B, C, or D. The table on the next page explains each classification.

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ASIA Classification

Classification	Description of Function
A = Complete	No motor or sensory function is preserved in the sacral segments S4–S5
B = Incomplete	Sensory, but not motor function is preserved below the neurological level and includes the sacral segments S4–S5
C = Incomplete	Motor function is preserved below the neurological level, and more than half of key muscles below the neurological level have a muscle grade less than 3.
D = Incomplete	Motor function is preserved below the neurological level, and at least half of key muscles below the neurological level have a muscle grade of 3 or more.
E = Not Affected	Motor and sensory function are normal

Description of Clinical Syndromes:

- **Central Cord:** an injury to the central cord usually occurs in the neck and more commonly affects mobility of the upper limbs.
- **Brown-Sequard:** this syndrome usually results in a larger impairment to one side of the spinal cord and therefore greater loss of movement and sensation to one side of the body.
- **Anterior Cord:** anterior refers to 'the front' and this type of injury will usually result in impairment to motor systems with some preservation to sensory systems.
- **Conus Medullaris / Cauda Equina:** these terms refer to the bundle of nerves (often referred to as the 'horse's tail') that spread out from the base of the spinal cord. These nerves supply bladder, bowel and sexual function. Damage to the cauda equina may result in partial loss of motor and sensation abilities.

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How might having a spinal cord injury affect me?

- Loss of movement below the level of the injury
- Loss of sensation below the level of injury
- Blood pressure and circulation may be altered
- Breathing may be affected
- Temperature control, including affects on sweating and shivering
- Bladder and bowel function may be altered
- Sexual function may be altered
- Fertility may be affected

As well as affecting your body, having a spinal cord injury can also affect the way you feel. Many people experience, understandably, some period of distress following a spinal cord injury. Living with any medical condition increases the chance of experiencing anxiety or depression.
For most people, this period of distress will settle down relatively soon after injury. If feelings of distress do persist, it is a good idea to speak to your health practitioner about effective ways to manage these feelings. Refer to the "Adjusting to you Injury" fact sheet in this series for further information.

Remember – All spinal cord injuries are different and what happens with one person does not necessarily happen with another.

REFERENCES

1. Check the resources available at your Spinal Unit. Talk with your rehabilitation team and they will be able to discuss your questions and provide written information for you and your family.

2. The internet is full of information on spinal cord injury. Some great information is available at:
- www.spinalinjury.net
- www.apparelyzed.com
- www.sci-info-pages.com
- www.pva.org

3. Verkaaik Julian. "Back on Track" handbook
- www.nzspinaltrust.org.nz/pub_backontrack.asp

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