English

Spinal Cord Injury – the basics

The Spinal Cord is a **column** of **nerve** tissue that runs from the base of the skull down the centre of the back. The **spinal cord** and the membranes covering it are surrounded by the vertebrae (back bones). Spinal cord injury occurs when something interferes with the function or structure of the spinal cord.

Spinal Cord injury can be caused by illness, traumatic accident, bones pressing on the cord, lack of oxygen, or cutting or tearing of the spinal cord.

The impacts of a spinal cord injury vary widely, based on the type and location of the injury. The most common impacts are loss of the ability to independently move limbs below the level of injury and reduced nerve sensations. In general, the higher in the spinal cord an injury occurs, the more function, sensation and internal body functions will be affected.

Injury that affects all four limbs is called tetraplegia (this used to be called quadriplegia). An injury that affects the lower half of the body is called paraplegia. The significance of these injuries is much more than just arm and leg movement as sensation and all body systems can be affected.

“Complete” injuries are those where there is no function or sensation below the level of injury. It really means all messages to and from the brain are completely blocked. It does NOT mean your spinal cord is completely severed. Complete injuries indicate no messages are getting through the affected area of injury in the spinal cord. “Incomplete” injury indicates some messages are getting through. Incomplete injuries are unique to the person. No two incomplete injuries are exactly the same, although they can be similar. Abilities of an individual with an incomplete injury depend on which nerves are transmitting messages. The severity and impact of Spinal Injuries are classified using the International Standards for neuorological classification of Spinal Cord Injury developed by the American Spinal Injury Association – commonly known as an ASIA score. A person’s ASIA score enables medical professionals to communicate more clearly about the level and impact of spinal cord injury.

Body Areas Controlled by Spinal Cord Sections

Cervical Spinal Cord Section

The nerves exiting the vertebrae in the neck area or cervical segments are referred to as C1 through C8. These nerve control signals to the neck, arms, hands, and internal organs. Injuries to these areas result in tetraplegia.

Individuals who have an injury above the C4 level usually have loss of movement and sensation in all four limbs, although often shoulder and neck movement is available to facilitate sip and puff devices for mobility, environmental control and communication.

Individuals with C5 injuries often have control of shoulder and biceps, but there is not much control at the wrist or hand. Individuals with a C5 level of injury typically can feed themselves and perform some activities of daily living.

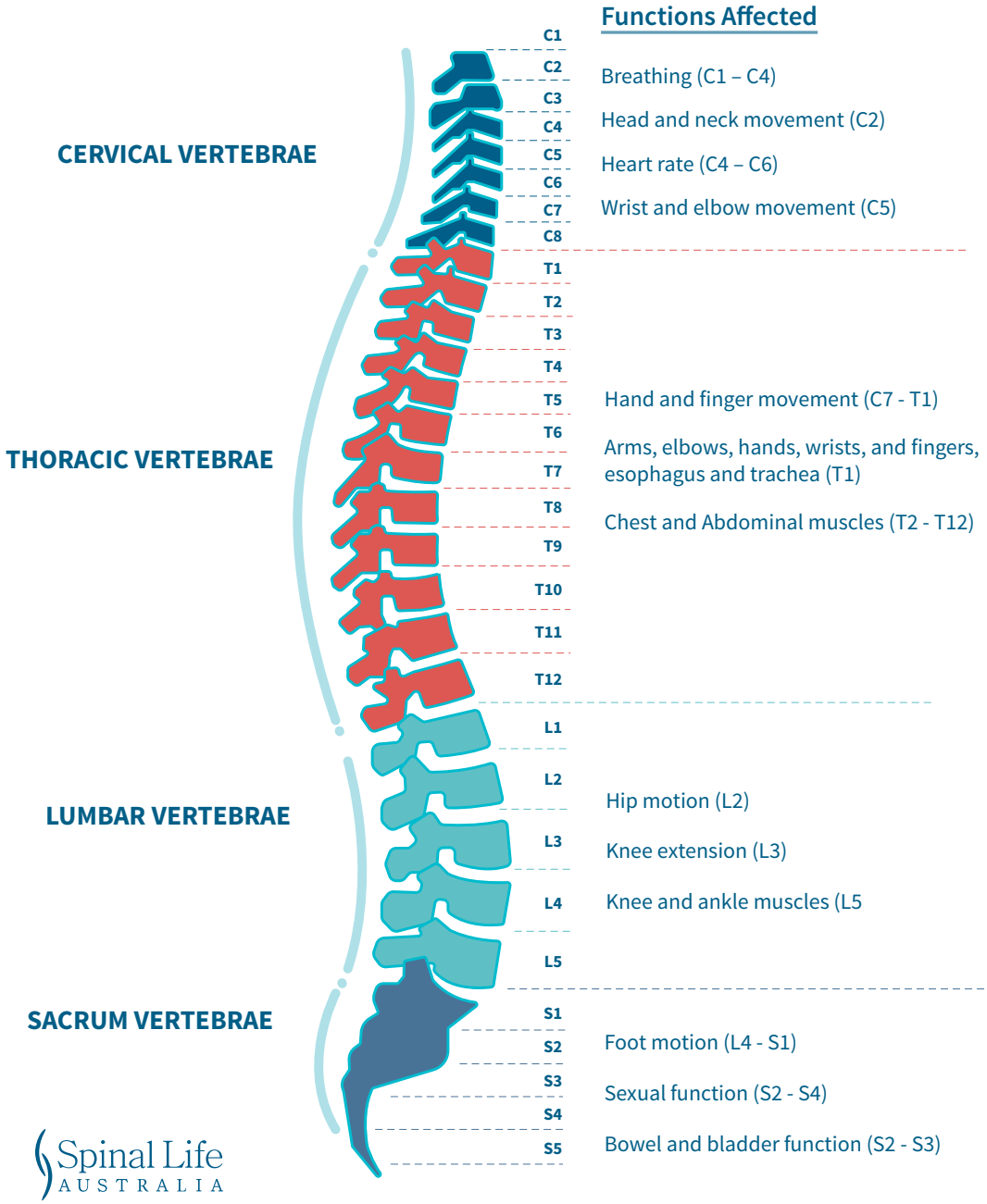
An individual with an injury at C6 generally has enough wrist control to be able to drive adapted vehicles and handle some toileting activities but lacks fine motor control.

Thoracic Spinal Cord Section

Nerves in the thoracic or rib cage area (T1 through T 12) relay signals to the torso and some parts of the arms.

Injuries from T1 to T8 usually affect the individual's control of the upper torso, limiting trunk movement and sensation as the result of a lack of abdominal muscle control. This can affect balance as well as proprioception (where your body is in space).

Those individuals with lower thoracic injuries (T9 through T12) have trunk control and some abdominal muscle control.



Lumbar and Sacral Sections

Nerves in the lumbar and sacral levels of the spinal cord affect the legs, bowel, bladder and sexual function. The lower nerves are peripheral nerves (outside of the spinal cord) and *may* be able to be transferred, split or grafted surgically to improve function.

Secondary conditions caused by Spinal Cord Injury

Besides a loss of sensation or motor function, injury to the spinal cord may lead to other changes in the body. The body is still working below the level of injury, but messages to and from the brain are not being communicated through the site of injury.

Some of the complications of spinal cord injury are preventable with good healthcare, diet and physical activity although sometimes they occur even with the best of efforts.

There are many secondary complications that are possible after experiencing a spinal cord injury, from calcium loss in bones, to loss of muscle tissue, through to pain, poor muscle tone, decreased balance and co-ordination, low blood pressure, Deep Vein Thrombosis, and Oedema (pooling of fluid in legs or arms). Possible complications also include decreased lung capacity, incontinence, bowel routine interruptions, Urinary Tract Infections, increase in skin breakdown leading to pressure areas and possible sexual dysfunction.

Rehabilitation after Spinal Cord Injury

Rehabilitation can continue through outpatient treatment, home therapy or an independent therapy program. Lifelong therapy is recommended to maintain your function and maximise your health and wellbeing. It might be that you will need to continue therapy on your own, without a therapist present, but keeping up with activity is important to your lifelong rehabilitation.

The nervous system has been determined to be plastic, meaning it will adapt to changes within it.
Keeping yourself healthy may be significant to improving function.

There are currently no treatments or cures for Spinal Cord Injury, however internationally and here in Australia researchers are working towards possible treatments

Further reading

Back on Track – NZ Spinal Trust https://nzspinaltrust.org.nz/resources/back-on-track/