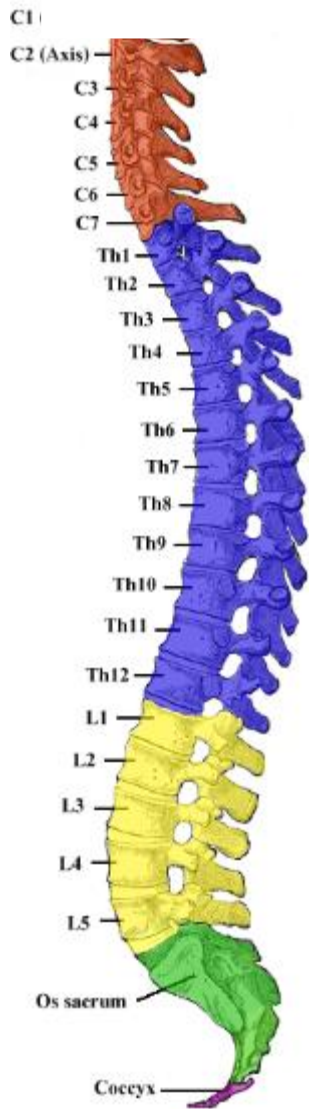


Actions of the spinal nerves



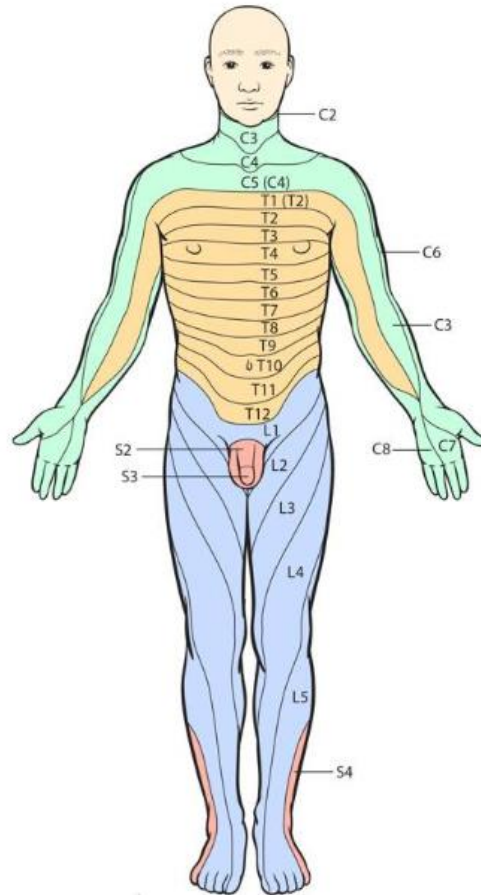
Level	Motor Function
C1–C6	Neck flexors
C1–T1	Neck extensors
C3, C4, C5	Supply diaphragm (mostly C4)
C5, C6	Move shoulder, raise arm (deltoid); flex elbow (biceps)
C6	Externally rotate (supinate) the arm
C6, C7	Extend elbow and wrist (triceps and wrist extensors); pronate wrist
C7, T1	Flex wrist; supply small muscles of the hand
T1–T6	Intercostals and trunk above the waist
T7–L1	Abdominal muscles
L1–L4	Flex thigh
L2, L3, L4	Adduct thigh; Extend leg at the knee (quadriceps femoris)
L4, L5, S1	Abduct thigh; Flex leg at the knee (hamstrings); Dorsiflex foot (tibialis anterior); Extend toes
L5, S1, S2	Extend leg at the hip (gluteus maximus); Plantar flex foot and flex toes



Cervical SCI



Fallout



Impact

C1 – C4 injury

Most severe of the spinal cord injury levels

Paralysis in arms, hands, trunk and legs

Patient may not be able to breathe on his or her own, cough, or control bowel or bladder movements.

Ability to speak is sometimes impaired or reduced.

When all four limbs are affected, this is called tetraplegia or quadriplegia.

Requires complete assistance with activities of daily living, such as eating, dressing, bathing, and getting in or out of bed

May be able to use powered wheelchairs with special controls to move around on their own

Will not be able to drive a car on their own

Requires 24-hour-a-day personal care

C5 injury

Person can raise his or her arms and bend elbows.

Likely to have some or total paralysis of wrists, hands, trunk and legs

Can speak and use diaphragm, but breathing will be weakened

Will need assistance with most activities of daily living, but once in a power wheelchair, can move from one place to another independently

C6 injury

Nerves affect wrist extension.

Paralysis in hands, trunk and legs, typically

Should be able to bend wrists back

Can speak and use diaphragm, but breathing will be weakened

Can move in and out of wheelchair and bed with assistive equipment

May also be able to drive an adapted vehicle

Little or no voluntary control of bowel or bladder, but may be able to manage on their own with special equipment

C7 injury

Nerves control elbow extension and some finger extension.

Most can straighten their arm and have normal movement of their shoulders.

Can do most activities of daily living by themselves, but may need assistance with more difficult tasks

May also be able to drive an adapted vehicle

Little or no voluntary control of bowel or bladder, but may be able to manage on their own with special equipment

C8 injury

Nerves control some hand movement.

Should be able to grasp and release objects

Can do most activities of daily living by themselves, but may need assistance with more difficult tasks

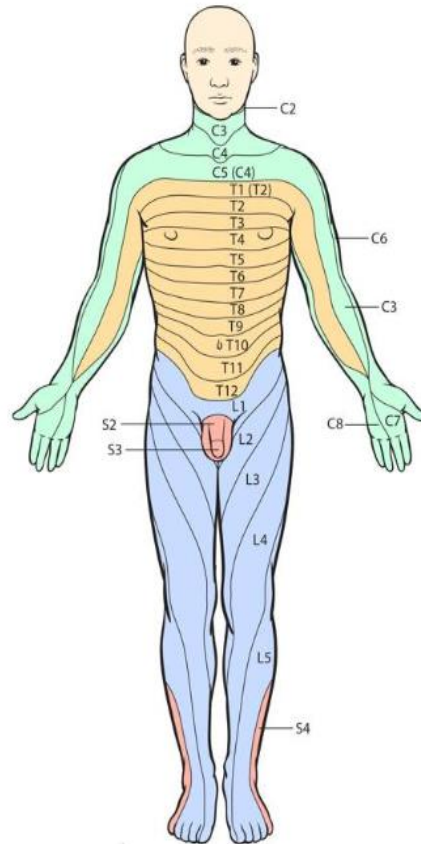
May also be able to drive an adapted vehicle

Little or no voluntary control of bowel or bladder, but may be able to manage on their own with special equipment

Thoracic SCI



Fallout



Impact

Thoracic Nerves (T1 – T5)

Corresponding nerves affect muscles, upper chest, mid-back and abdominal muscles.

Arm and hand function is usually normal.

Injuries usually affect the trunk and legs (also known as paraplegia).

Most likely use a manual wheelchair

Can learn to drive a modified car

Can stand in a standing frame, while others may walk with braces

Thoracic Nerves (T6 – T12)

Nerves affect muscles of the trunk (abdominal and back muscles) depending on the level of injury.

Usually results in paraplegia

Normal upper-body movement

Fair to good ability to control and balance trunk while in the seated position

Should be able to cough productively (if abdominal muscles are intact)

Little or no voluntary control of bowel or bladder but can manage on their own with special equipment

Most likely use a manual wheelchair

Can learn to drive a modified car

Can stand in a standing frame, while others may walk with braces.

ASIA/ISCoS Exam Chart (ASIA Impairment Scale)

Grade A: Complete lack of motor and sensory function below the level of injury (including the anal area)

Grade B: Some sensation below the level of the injury (including anal sensation)

Grade C: Some muscle movement is spared below the level of injury, but 50 percent of the muscles below the level of injury cannot move against gravity.

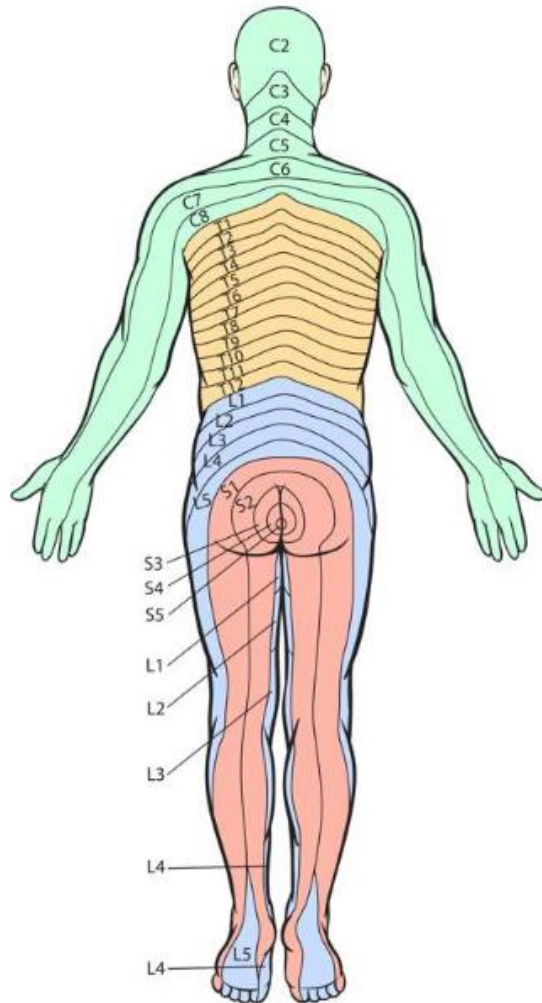
Grade D: Most (more than 50 percent) of the muscles that are spared below the level of injury are strong enough to move against gravity.

Grade E: All neurologic function has returned.

Lumbar & Sacral SCI



Fallout



Impact

Lumbar Nerves (L1 – L5)

Injuries generally result in some loss of function in the hips and legs.

Little or no voluntary control of bowel or bladder, but can manage on their own with special equipment

Depending on strength in the legs, may need a wheelchair and may also walk with braces

Sacral Nerves (S1 – S5)

Injuries generally result in some loss of function in the hips and legs.

Little or no voluntary control of bowel or bladder, but can manage on their own with special equipment

Most likely will be able to walk

Quadriplegia / Tetraplegia

Quadriplegia / Tetraplegia is the medical term used when a person has a spinal cord injury above the first thoracic vertebra. Paralysis affects the cervical spinal nerves (C1-C8) resulting in paralysis in varying degrees in all four limbs. In addition to the arms and legs being paralysed, the abdominal and chest muscles will also be affected resulting in weakened breathing and the inability to properly cough and clear the chest.

Paraplegia

Paraplegia is a term used when the level of spinal cord injury occurs below the first thoracic spinal nerve (T1-S5). The degree at which the person is paralysed can vary from the impairment of leg movement, to complete paralysis of the legs and abdomen up to the nipple line. Paraplegics have full use of their arms and hands.

Sources:

1. Shepherd Center; *Understanding Spinal Cord Injuries*.
2. Apparelysed; *Spinal Cord Injury Peer Support*
3. Wikipedia; *Spinal Cord Injury*