

Diagnostic Protocol

Diagnostic Grouping

Spinal Cord Injury

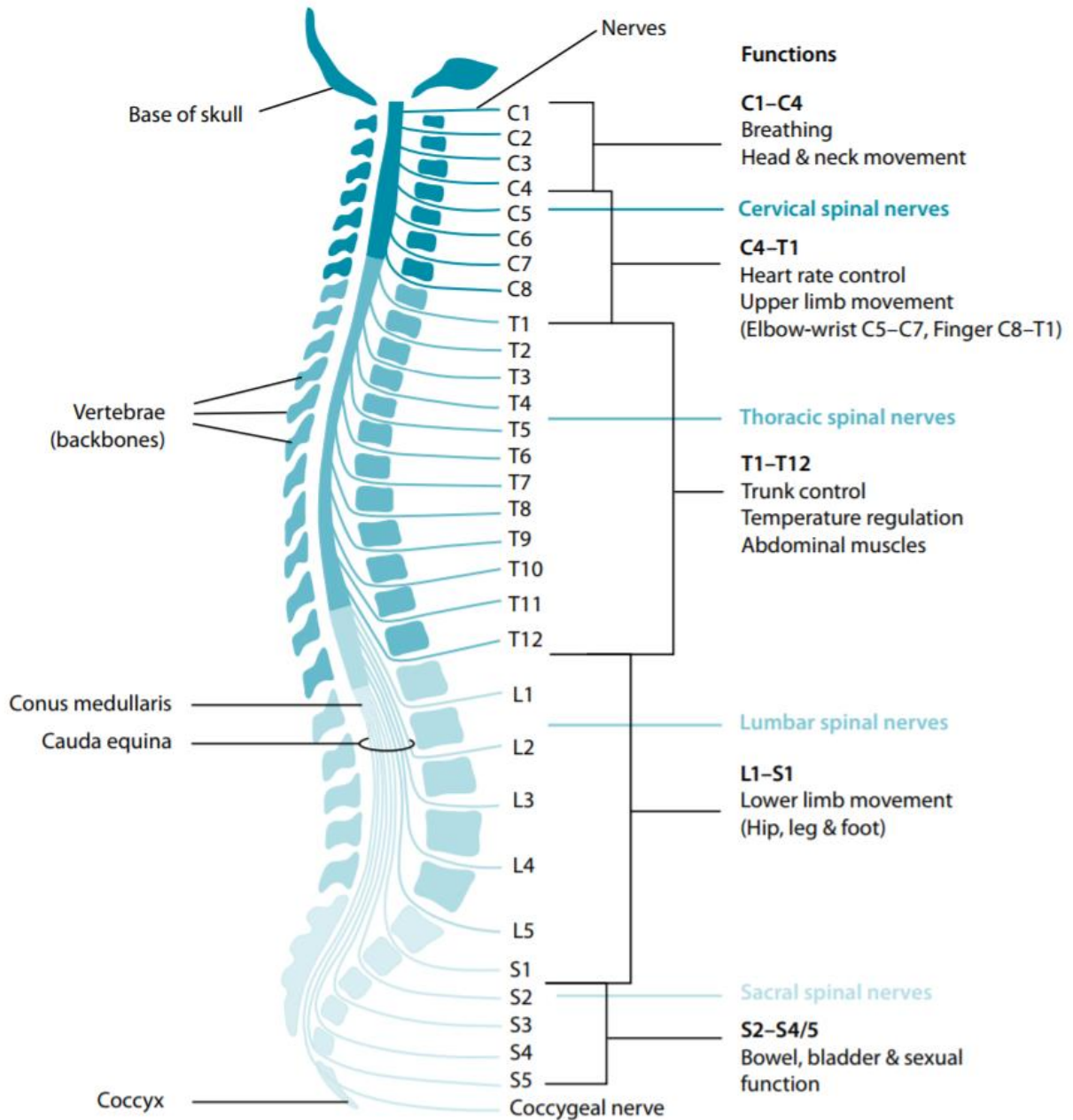
- Damage to the spinal cord resulting from trauma (e.g. a car crash) or from disease or degeneration (e.g. cancer).
- Every year, around the world, between 250,000 and 500,000 people suffer a spinal cord injury (SCI).
- Damage to any part of the spinal cord or nerves at the end of the spinal canal (cauda equina) — often causes permanent changes in strength, sensation and other body functions below the site of the injury.

Paraplegia

- Thoracic (T2-T12), Lumbar (L1-L5), or Sacral (S1-S5)
- This term refers to impairment or loss of motor and/or sensory function in the thoracic, lumbar or sacral (but not cervical) segments of the spinal cord, secondary to damage of neural elements within the spinal canal. With paraplegia, arm functioning is spared, but, depending on the level of injury, the trunk, legs and pelvic organs may be involved. The term is used in referring to cauda equina and conus medullaris injuries, but not to lumbosacral plexus lesions or injury to peripheral nerves outside the neural canal.

Tetraplegia

- This term refers to impairment or loss of motor and/or sensory function in the cervical segments of the spinal cord due to damage of neural elements within the spinal canal. Tetraplegia results in impairment of function in the arms as well as in the trunk, legs and pelvic organs. It does not include brachial plexus lesions or injury to peripheral nerves outside the neural canal.



Specific Diagnosis

- T-12 injury
- Paraplegic
 - No movement of the legs
- Limited trunk control
 - Effects lower abdominal muscles
- Difficulties with temperature regulation

Identified Problems

- Loss of varying degrees of control of the lower limbs and trunk without involvement of the upper limbs.
- Poor social health
 - Do not wish to go in public due to trauma or disability
 - Lack of accessibility or adaptive resources
 - Inability to function the same as before may create social barriers
- Poor mental health
 - Depression is a related factor due to its prevalence after an accident and the individuals more restricted lifestyle.
- Poor sexual health
 - Sexuality, fertility and sexual function may be affected by a spinal cord injury. Men may notice changes in erection and ejaculation; women may notice changes in lubrication.
- Poor physical health
 - Weight loss and muscle atrophy are common soon after a spinal cord injury. Limited mobility may lead to a more sedentary lifestyle, placing one at risk of obesity, cardiovascular disease and diabetes.

Specific effects at different vertebrae:

- C2±Occipital protuberance
- C3±Supraclavicular fossa
- C4±Top of the acromioclavicular joint
- C5±Lateral side of the antecubital fossa
- C6±Thumb
- C7±Middle finger
- C8±Little finger
- T1±Medial (ulnar) side of the antecubital fossa
- T2±Apex of the axilla
- T3±Third intercostal space (IS)
- T4±Fourth IS (nipple line)
- T5±Fifth IS (midway between T4 and T6)
- T6±Sixth IS (level of xiphisternum)
- T7±Seventh IS (midway between T6 and T8)
- T8±Eighth IS (midway between T6 and T10)
- T9±Ninth IS (midway between T8 and T10)
- T10±Tenth IS (umbilicus)
- T11±Eleventh IS (Midway between T10 and T12)
- T12±Inguinal ligament at mid-point
- L1±Half the distance between T12 and L2
- L2±Mid-anterior thigh

- L3±Medial femoral condyle
- L4±Medial malleolus
- L5±Dorsum of the foot at the third metatarsal
- phalangeal joint
- S1±Lateral heel
- S2±Popliteal fossa in the mid-line
- S3±Ischial tuberosity
- S4±5 Perianal area (taken as one level)

Related factor

- Circulatory Control
 - A spinal cord injury may cause circulatory problems ranging from low blood pressure when you rise (orthostatic hypotension) to swelling of the extremities. These circulation changes may also increase risk of developing blood clots, such as deep vein thrombosis or a pulmonary embolus.
 - deep vein thrombosis
 - Occurs when a blood clot (thrombus) forms in one or more of the deep veins in the body, usually in legs. Deep vein thrombosis can cause leg pain or swelling, but also can occur with no symptoms.
 - Another problem with circulatory control is a potentially life-threatening rise in blood pressure (autonomic hyperreflexia).
- Bladder Control
 - The bladder will continue to store urine from the kidneys. However, the brain may not be able to control the bladder as well because the message carrier (the spinal cord) has been injured.
 - The changes in bladder control increase the risk of urinary tract infections. The changes also may cause kidney infections and kidney or bladder stones.
- Muscle Spasms
 - uncontrolled tightening or motion in the muscles (spasticity) or soft and limp muscles lacking muscle tone (flaccidity).
- Osteoporosis
 - Weakness of bones from little or no use
- Pressure Ulcers
 - For individuals that sit in chairs there is a high percentage for them to get ulcers from constantly using a wheelchair. The skin below the injury does not feel sensations as well as before the injury.
- Chronic Pain
 - Some people experience pain, such as muscle or joint pain, from overuse of particular muscle groups. Nerve pain can occur after a spinal cord injury, especially in someone with an incomplete injury
- Respiratory Complications

- The injury may make it more difficult to breathe and cough if the abdominal and chest muscles are affected. These include the diaphragm and the muscles in the chest wall and abdomen.
- The neurological level of injury will determine what kind of breathing problems one may have. If there is a cervical and thoracic spinal cord injury, the individual may have an increased risk of pneumonia or other lung problems.
- Traumatic Brain Injury
 - Can be associated with a traumatic spinal cord injury from a traumatic event, most likely a traffic accident or fall
- Depression
 - Coping with all the changes a spinal cord injury brings and living with pain causes some people to experience depression.
- Bowel control
 - Stomach and intestines work much like they did before the injury, control of bowel movements is often altered.

Etiologies

- Traumatic spinal cord injury may stem from a sudden, traumatic blow to your spine that fractures, dislocates, crushes or compresses one or more of your vertebrae. It also may result from a gunshot or knife wound that penetrates and cuts your spinal cord.
 - Road traffic crashes, falls, violence
- Nontraumatic spinal cord injury may be caused by arthritis, cancer, inflammation, infections or disk degeneration of the spine.
 - Disease
 - Degeneration
 - Birth defects

Process criteria (Interventions)

- Health promotion of mind, body and spirit
 - To empower the individual to be in charge of their wellbeing and decrease depression. This include education about at home activities for using certain muscles, eating healthy, and using techniques such as meditation during times of anger or stress.
- Independent functioning in Adaptive Recreation Programs
 - Education about independent activities and how to obtain the resources for them.
- Community Accessibility and socialization
 - Help the client to connect with other people in a leisure setting that have similar disabilities. This will create healthier social interactions and a support network.
 - Family may be able to interact in programs as well and feel involved
- Health promotion of functional skills
 - Using recreation activities to build muscles, increase strength and endurance to support physical therapy.

- Development of emotional identification and expression skills
 - Be able to communicate needs with others
 - Effectively socialize with others

Outcome criteria

- Client will communicate needs and emotions with family members and others
- Client will show a 25% increase in flexibility, endurance, and strength as measured in pre and post testing
- Client will demonstrate understanding, through leisure education program, of the importance of recreation/leisure in recovery and maintenance of spinal cord injury.

References

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3/5/2018