NZ Spinal Cord Injury Registry

New Zealand Spinal Cord Injury Registry

2018 CALENDAR YEAR REPORT

In partnership with PRAXIS Spinal Cord Institute

The New Zealand Spinal Cord Injury Registry (NZSCIR) would like to acknowledge the spinal service clinicians and coordinators for collecting and inputting data into the registry. Many thanks to statistician Chris Frampton and Praxis Spinal Cord Institute for their support and expertise in developing this report. And finally, thank you to the participants who enrolled in the NZSCIR – those with a spinal cord injury (SCI) – for contributing their time and experiences to the registry.

How to cite this document

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About this report

Adult services are provided by two supra-regional services delivered by Canterbury District Health Board (CDHB) and Counties Manukau Health (CM Health). Both services provide comprehensive acute care, rehabilitation and follow-up services for people with SCI.

NZSCIR looks at traumatic and non-traumatic SCI of adults in New Zealand (NZ). The NZSCIR Annual Report 2017 is an overview of the data collected from 217 NZSCIR participants who sustained a new SCI and were subsequently admitted to either supra-regional spinal service 1 January - 31 December 2018.

In this report you will find information about participant demographics, type of SCI and its causes, length of hospital stay, functional outcomes and secondary complications after SCI. The report's primary purpose is to serve as a descriptive account with no endorsement of, or recommendations about, policies or programmes. However, the data can be informative for research and clinical practice, as well as policy and programme planning. Data from this report provides researchers, health care providers and decision makers with knowledge that may support strategies to improve SCI care services within their facilities.

We welcome feedback or questions on this report. Please contact us at NZSCIR@cdhb.health.nz or NZSCIR@middlemore.co.nz

For more information about NZSCIR, please visit www.nzspinaltrust.org.nz/nzscir

Certain terms are bolded throughout this report. For definitions, please refer to the glossary on page 11.

Spinal cord injury and the Registry

Spinal cord injury

The cause of the spinal cord damage determines if it is a traumatic or non-traumatic SCI. An injury sustained from a physical impact, such as a fall or motor vehicle crash, is referred to as a traumatic SCI. An injury that occurs in other ways, such as from degeneration, infection or cancer, is referred to as a non-traumatic SCI.

History of the Registry

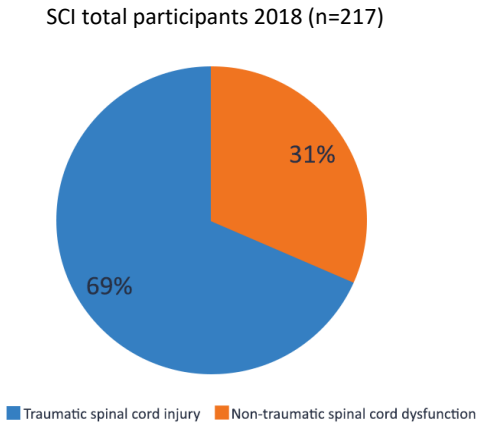
The NZSCIR was established in August 2016 and is jointly funded by the Accident Compensation Corporation, CDHB and CM Health, in partnership with Praxis Spinal Cord Institute.

Contributors

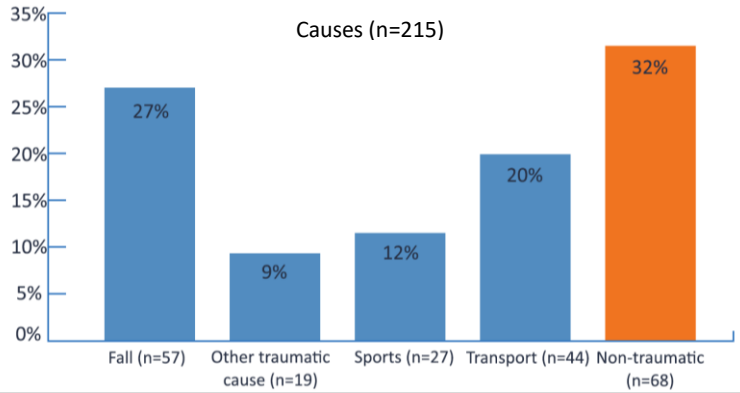
The most vital and fundamental component of NZSCIR is its contributors - people with a SCI. Thank you to those who have contributed their time and experiences to the registry. Their continued participation determines the value and success of NZSCIR.

What are the causes of spinal cord injury?

Prior to the establishment of NZSCIR, the NZ incidence of SCI was estimated at 30 per million, with approximately half related to a traumatic injury. According to NZSCIR data, 69% of spinal cord injuries are traumatic injuries in both 2017 and 2018 calendar years.

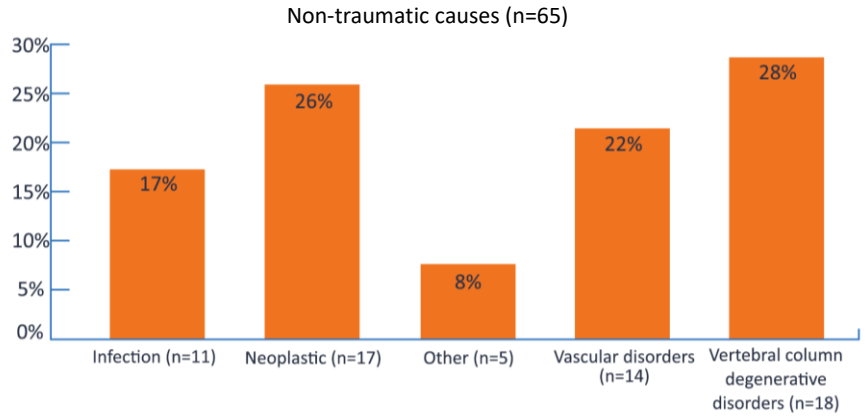


Falls were the most common cause of traumatic injury. An injury related to a fall can be caused by anything from a slip on a sidewalk to a fall from an apartment balcony. Transportation and sports followed falls as the most common cause of traumatic SCI. 55% of transportation causes were from light transport with four or more wheels and 23% from a two wheeled motor vehicle. 30% of sporting injuries were from water sports, 22% from equestrian and 19% from wheeled non-motorsports (mountain biking/cycling).



Disorders relating to degeneration of the spine were the most common causes of non-traumatic injuries. The spinal cord is protected by the spinal column. Deterioration of the spinal column, either in the discs, ligaments, joints or bones can lead to spinal cord damage.

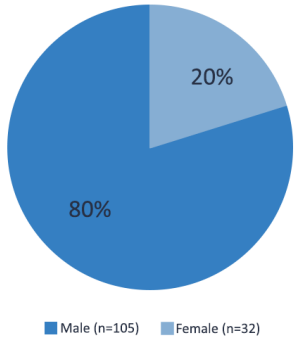
Non-traumatic SCI causes were fully reported in the 2018 calendar year to include malignant neoplasm improving information about non-traumatic causes. Neoplasms represent 26% of non-traumatic causes with the majority being of a malignant nature. "Other" causes may include inflammatory and auto-immune diseases.



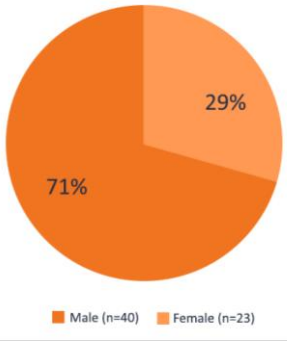
What does the population look like?

In 2018, males account for 77% of all SCI. This is up from 73% in 2017 with an increasing proportion of male non-traumatic injuries. However, the proportion of males remains higher in traumatic than non-traumatic injury groups.

Gender traumatic SCI (n=149)

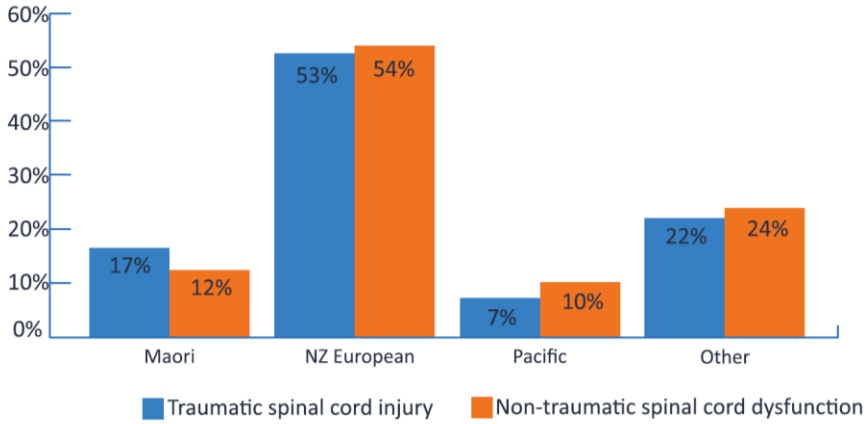


Gender non-traumatic SCI (n=68)



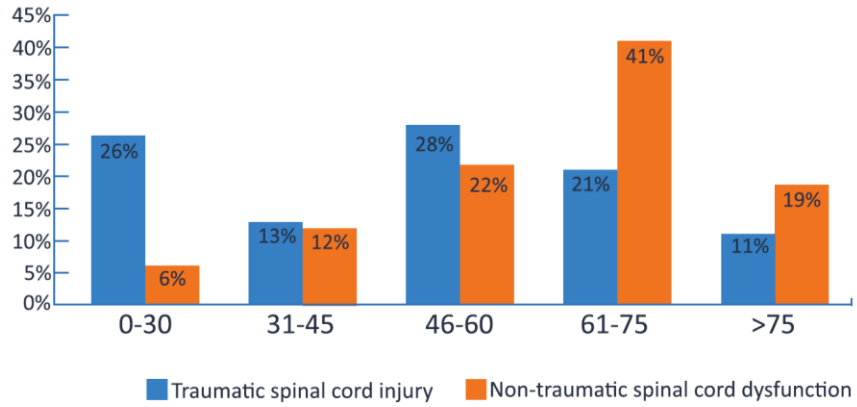
Most participants were of NZ European (53%) descent followed by Maori (16%) and Pacific people (8%). Pacific people includes Samoan, Tongan, Niuean, and Cook Island Māori. "Other" (23%) includes Chinese, Indian, NZ European/other (including Māori/Chinese).

Ethnicity (n=217)



The average age of NZSCIR participants was 53.7 years old. 14% of participants are aged over 75 years.

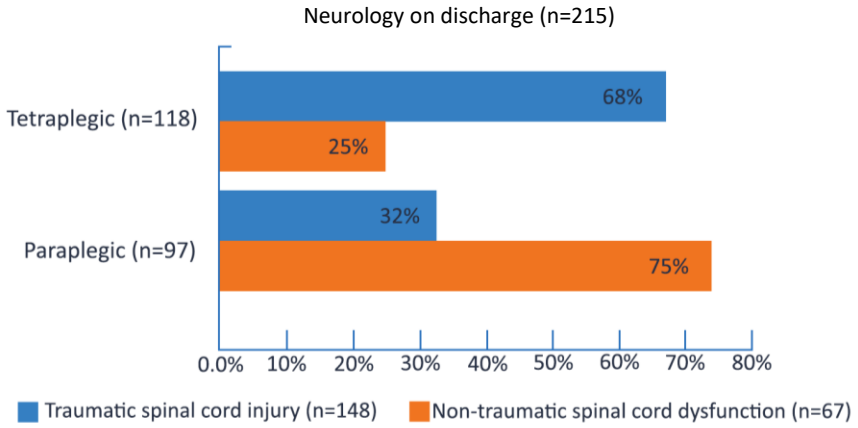
Injury by age group (n=217)



What is the severity and level of injury?

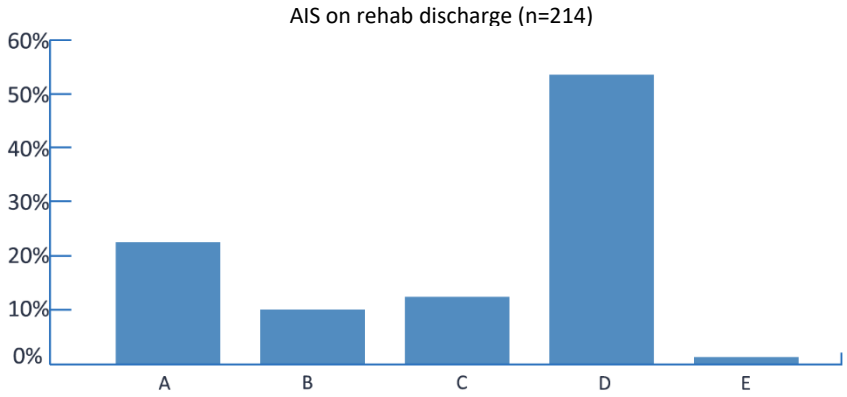
The spinal cord is divided into four regions, ***cervical***, ***thoracic, lumbar*** and ***sacral***. The level of injury identifies the lowest level of the spinal cord (from the head) that has normal movement and sensation. A person with a cervical (neck) injury will have decreased control or sensation in the arms, trunk and legs and those with a high cervical injury may not be able to breathe independently **(tetraplegia)**. With a thoracic injury, the person may have mild difficulties with their hands, but would certainly be affected in the trunk and legs **(paraplegia).** A person with a lumbar or sacral (lower back) injury may have decreased control or sensation in the trunk and legs **(paraplegia).** People with incomplete injuries at any level may be able to stand and walk depending on how their spinal cord was affected.

Participants' severity and level of injury are routinely assessed throughout their recovery using a standardised assessment form at one of the two supra-regional spinal services.



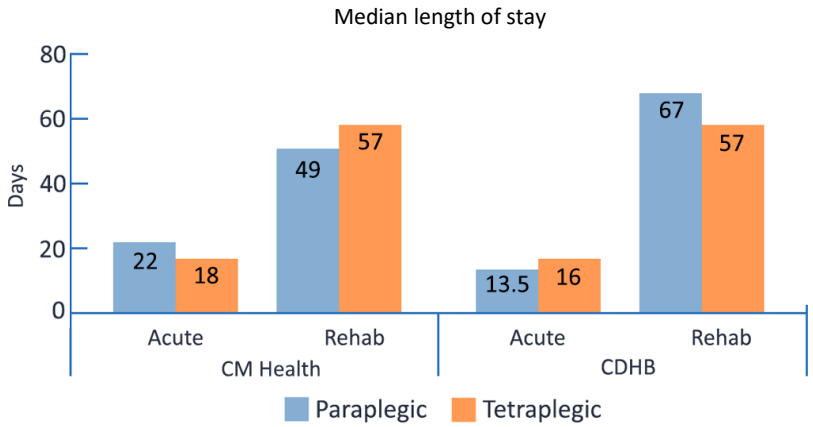
The extent of a participant's SCI is defined by the American Spinal Injury Association (ASIA) Impairment Scale (AIS).

Grade A: The impairment is complete. There is no motor or sensory function below the level of injury.
Grade B: The impairment is incomplete. Sensory function, but not motor function, is preserved below the neurologic level (the first normal level above the level of injury) and some sensation is preserved in the sacral segments S4 and S5.
Grade C: The impairment is incomplete. Motor function is preserved below the neurologic level, but more than half of the key muscles below the neurologic level have a muscle grade less than 3 (i.e. they are not strong enough to move against gravity).
Grade D: The impairment is incomplete. Motor function is preserved below the neurologic level, and at least half of the key muscles below the neurologic level have a muscle grade of 3 or more (i.e. the joints can be moved against gravity).
Grade E: The participant's functions are normal. All motor and sensory functions are unhindered.



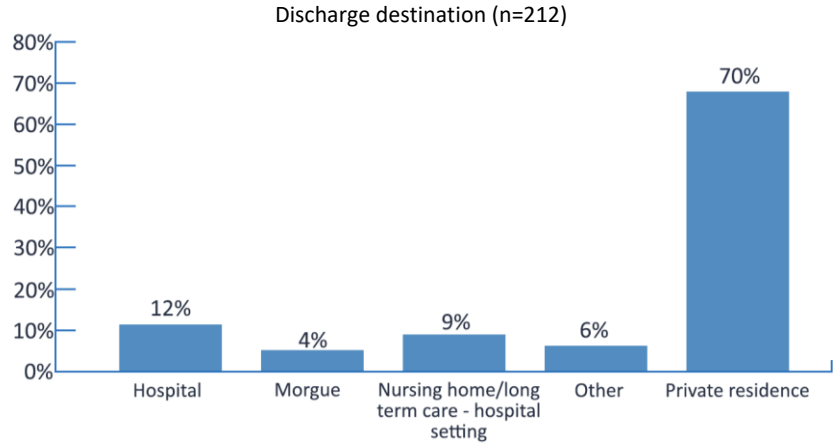
What is the duration of the hospital stay?

NZSCIR captures length of stay in acute and rehabilitation settings. The median length of stay for those with paraplegia was 16 days in acute care and 53 days in the rehabilitation service. Those with tetraplegia spent longer in acute care (median 17 days) and in the rehabilitation service (median 57 days). There was a significant reduction in the median length of stay in rehabilitation for tetraplegia in 2018 compared with 2017 (median 76 days).



Where do people go after discharge from hospital?

A private residence in the community was the most common location for discharged participants. "Hospital" indicates ongoing rehabilitation post-supra regional spinal service admission. Further refinement of discharge destination data is required to indicate if the move is to a temporary or permanent accommodation. Fewer people had a discharge destination of "Hospital" in 2018 than 2017 (15.1%) with more people being discharged to a private residence than in 2017 (65.8%).



How often do secondary complications occur in acute and/or rehabilitation care?

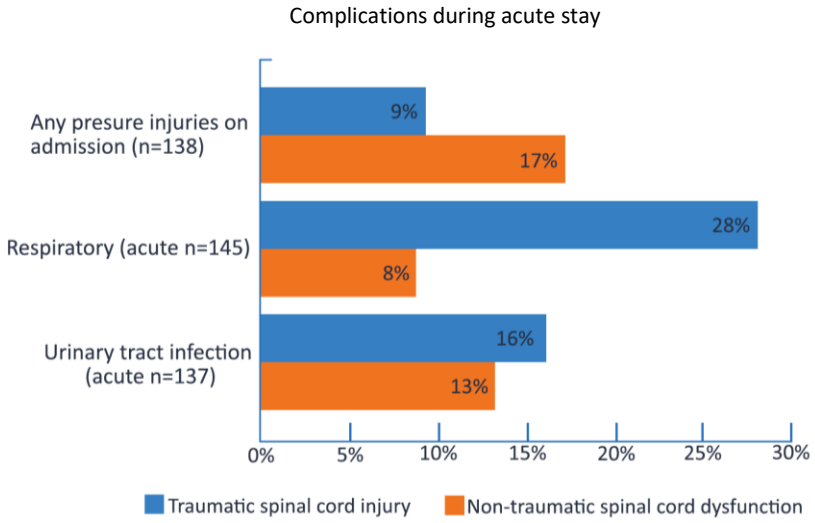
Pain upon discharge to the community was a commonly reported secondary complication. 84% of participants were receiving treatment for pain on discharge based on the records of 129 participants with complete complications data.

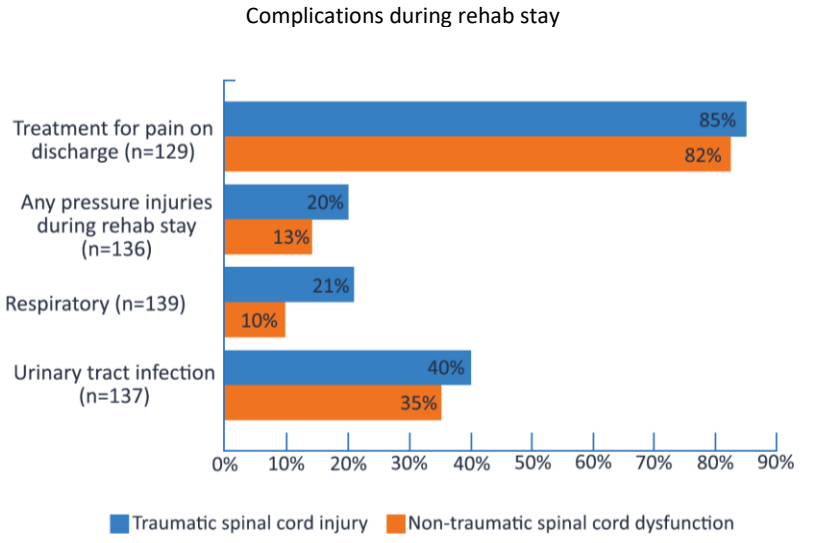
Urinary tract infections had a 15% incidence rate occurring during acute stay and a 39% incidence rate occurring during rehabilitation (40% in traumatic SCI; 35% in non-traumatic SCI). Information is based on the records of 137 participants with complete complications data.

Respiratory complications occurred in 21% of participants during the acute phase, and 17% during rehabilitation based on the records of 145 participants (acute care) and 139 (rehabilitation).

Pressure injuries occurred during rehabilitation in 18% of cases based on the records of 136 participants. Pressure injuries also occurred during acute care in 16% of cases, also based on the records of 138 participants.

Pre-injury co-morbidities reported were similar between the traumatic and non-traumatic SCI participants. The most common co-morbidities were hypertension, followed by diabetes and asthma.





What does the NZSCIR Annual Report 2018 tell us?

NZSCIR provides important information

NZSCIR helps connect clinicians, researchers, health care administrators and people living with SCI in order to facilitate the translation of research into clinical practice, and promote evidence-based practices to improve outcomes for those living with SCI. This report represents the second complete calendar year of data from the NZSCIR.

With two calendar years available, comparisons can start being made. Even with limited data, it will inform improvements in how SCI is managed in NZ.

NZSCIR will keep evolving to ensure it facilitates world class research, promotes excellence in care and meets the needs of people living with SCI.

Refinements will continue to be made to the data sets and collection methods to gather more complete data moving forward. Community follow-up on data collection is now underway as well as plans to enable more people with SCI to participate in the registry.

Denominators for report summaries

Note: NZSCIR collects an expanded data set for participants who consented (n=148, 68.2) and a minimal data set for those who were not consented (n=69, 31.8%). Participants were deemed to have complete data if key expected admission and discharge data had been entered into the database. The NZSCIR data used for this report were extracted on 24 May 2019.

Data collected from 217 new injuries between 1 January 2018 and 31 December 2018.

Number of participants represented in each data summary:

Traumatic SCI vs non-traumatic SCI: 217

Mechanism and cause of Injury: 215

Gender: 217

Ethnicity: 214

Age: 217

Severity and level of injury: AIS 214 and level of injury 215

Traumatic SCI acute length of stay: 136

Rehab length of stay: 136

Discharge destination: 212

Complications during rehab:

- Pain: 129
- UTI: 137
- Respiratory: 139
- Pressure injuries: 136

Glossary

Cervical spine - The upper seven vertebrae located in the neck (C1 - C7). The nerves in this area control head and neck movement, the diaphragm, deltoids, biceps, and muscles controlling the wrist and hands.

Complete injury - An injury where there is no sensory and motor function (inability to feel or move) preserved in the last nerves leaving the spinal cord (sacral 4th and 5th nerves). This usually results in a total lack of sensory and motor function below the level of the injury.

Incomplete injury - An injury where there is some sensory or motor function (ability to feel, touch or move) below the level of the injury. This must include the last nerves leaving the spinal cord (sacral 4th and 5th nerves).

Lumbar spine - The five vertebrae in the lower back (L1 - L5). Injury to this area damages the very lowermost tip of the spinal cord (known as the conus medullaris) or the cauda equina which results in decreased control of hips and legs, as well as bladder, bowel and sexual function.

Non-traumatic spinal cord injury (non-traumatic SCI) - A spinal cord injury that occurs as a result of a medical cause such as degeneration, infection or cancer.

Paraplegia - Complete or partial loss of sensation and/or movement in the legs and often in part of, or the entire trunk. It is caused by an injury to the spinal cord in the thoracic (trunk) region or below including cauda equina.

Pressure injuries -Tissue injured by pressure and/or shear.

Respiratory complications – Includes pneumonia, venothromboembolic events (including pulmonary embolus and deep vein thrombosis), obstructive sleep apnea and other respiratory conditions.

Sacral spine -The five vertebrae located in the pelvic area (S1 - S5). As with lumbar injuries, damage to the sacral nerves can result in decreased control of hips, legs, bladder, bowel and sexual function.

Supra-regional spinal service/facility - NZ has two supra-regional spinal services and four facilities. Canterbury District Health Board: Christchurch Hospital (acute) and Burwood Spinal Unit (acute/rehabilitation). Counties Manukau Health: Middlemore Hospital (acute) and Auckland Spinal Rehabilitation Unit (rehabilitation).

Spinal cord injury (SCI) - Damage to the spinal cord resulting in impairment of muscle function, sensation and/or autonomic function (bowel, bladder and sexual function).

Tetraplegia or Quadriplegia - Complete or partial loss of sensation and/or movement in the arms, and typically in the trunk and legs. It is caused by an injury to the spinal cord in the neck.

Thoracic spine - The twelve vertebrae that extend through the chest area (T1 - T12). The nerves in this area control chest and abdominal muscles.

Traumatic spinal cord injury (traumatic SCI) - A spinal cord injury that occurs as a result of trauma such as a vehicle crash or fall from a building.

Urinary Tract Infection (UTI) - A bacterial infection of the urinary tract, treated with antibiotics.

NZSCIR is sponsored by the Accident Compensation Corporation, Canterbury DHB and Counties Manukau Health

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