

<p>Author Year Country Research Design PEDro Score Total Sample Size</p>	<p>Methods</p>	<p>Outcome</p>
<b>Non-traumatic versus Traumatic</b>		
<p><a href="#">Osterthun et al.</a> (2009) Netherlands Case control N<sub>Initial</sub>=919, N<sub>Final</sub>=919</p>	<p><b>Population:</b> <i>Traumatic SCI:</i> Mean age=43.4yr; Gender: male:female=2.8:1; Level of injury: tetraplegia=49.6%; Severity of injury: complete=52.3%; <i>Non-traumatic SCI:</i> Mean age=57.2yr; Gender: male:female=1.2:1; Level of injury: tetraplegia=24.2%; Severity of injury: complete=25.9% <b>Intervention:</b> No intervention. Those with traumatic SCI were compared to those with non-traumatic SCI. <b>Outcome Measures:</b> Functional status, LOS.</p>	<ol style="list-style-type: none"> <li>1. Functional status at admission and gain during rehabilitation was significantly higher in patients with non-traumatic SCI (p&lt;0.001).</li> <li>2. No significant difference between the two groups was seen in their admission to rehabilitation.</li> <li>3. Age and better functional status on admission was associated with shorter length of stay (p=0.001).</li> <li>4. Functional outcome was not correlated with age; however it was significantly correlated with functional status at admission and LOS.</li> </ol>
<p><a href="#">Bradbury et al.</a> (2008) Canada Case control N<sub>Initial</sub>=20, N<sub>Final</sub>=20</p>	<p><b>Population:</b> <i>SCI/TBI:</i> Mean age=35.9yr; Gender: males=7, females=3; Level of injury: C=6, L=1, T=3; Severity of injury: complete=3, incomplete=7; <i>SCI:</i> Mean age=36.3yr; Gender: males=7, females=3; Level of injury: C=6, L=1, T=3; Severity of injury: complete=3, incomplete=7. <b>Intervention:</b> No intervention. Rehabilitation data of patients with SCI and TBI was analyzed against those with SCI alone. <b>Outcome Measures:</b> Behavioral incidents, Personality Assessment Inventory, Stroop, FIM, costs.</p>	<ol style="list-style-type: none"> <li>1. No significant difference between the two was seen in motor FIM scores.</li> <li>2. Patients with both SCI and TBI tended to stay longer in rehabilitation however this trend did not reach significance.</li> <li>3. The difference in average cost of a dual diagnosis compared to the single SCI diagnosis had clinical significance (\$169,638 versus \$130,773, p=0.17).</li> <li>4. Clinical significance was also reached in the total cost per FIM change score between the two groups (p=0.13).</li> </ol>
<p><a href="#">Gupta et al.</a> (2008) India Case Control N<sub>Initial</sub>=76, N<sub>Final</sub>=76</p>	<p><b>Population:</b> <i>Traumatic (n=38):</i> Mean age=32.86yr; Gender: males=34, females=4. <i>Non-traumatic (n=38):</i> Mean age=31.10; Gender: males=16, females=22 <b>Intervention:</b> Admission/discharge data from all surviving non-traumatic and traumatic spinal cord lesion (SCL) patients in a neurological rehabilitation facility was assessed over a 2yr period. <b>Outcome Measures:</b> LOS, BI, AIS collected at admission and discharge.</p>	<ol style="list-style-type: none"> <li>1. The traumatic SCL group had significantly more males than females (p&lt;0.05) and was not significantly different in age, marriage, education or socioeconomic factors.</li> <li>2. LOS was 66.0±47.7 days (trauma) and 60.7±45.7 which was not significantly different between groups.</li> <li>3. Both trauma and non trauma patients showed significant gains in function with BI increasing significantly from admission to discharge (p&lt;0.05) although there was no between group differences.</li> <li>1. AIS scores showed non traumatic patients had significantly more impairment than the traumatic at both admission and discharge (p=0.020, p=0.017) (Overall change in AIS not reported).</li> </ol>
<p><a href="#">McKinley et al.</a> (2008) USA Case control N<sub>Initial</sub>=594, N<sub>Final</sub>=594</p>	<p><b>Population:</b> Infection related spinal cord disease (<i>IR-SCD</i>): Mean age=53.3yr; Gender: males=64.7%; Level of injury: paraplegia=74%.</p>	<ol style="list-style-type: none"> <li>2. When compared with traumatic SCI (n=560), patients with IR-SCD comprised significantly less of the SCI/D rehabilitation admissions (3% versus 61%), were older (53 versus 40yr), and more often female (35%</li> </ol>

	<p>Traumatic SCI: Mean age=40.4yr; Gender: males=83.8%; Level of injury: paraplegia=49%</p> <p><b>Intervention:</b> No intervention. Data was reviewed of individuals diagnosed with infection related SCD against those with traumatic SCI.</p> <p><b>Outcome Measures:</b> Acute and rehabilitation hospital LOS, FIM motor scores, FIM motor change, FIM motor efficiency, AIS change.</p>	<p>versus 16%). Injuries were more commonly located in the thoracic region (48% versus 38%).</p> <ol style="list-style-type: none"> <li>Patients with IR-SCD more often had incomplete injuries (94% versus 57%).</li> <li>Thirty-two percent of IR-SCD patients had improvements in ASIA impairment scale classification. LOS was longer on acute care (25 versus 16 days), but similar on rehabilitation (36 versus 34 days), and with lower FIM motor changes (16.2 versus 22.8) during rehabilitation.</li> <li>Patients with IR-SCD were less often discharged to home (56% versus 75%).</li> </ol>
<p><a href="#">Ones et al.</a> (2007) Turkey Case control N<sub>Initial</sub>=194, N<sub>Final</sub>=194</p>	<p><b>Population:</b> <i>SCI Non-traumatic (n=63):</i> Mean age=49.87yr; Gender: males=30, females=33; Level of injury: paraplegia=52, tetraplegia=11; Severity of injury: complete=18, incomplete=45; Work status: working=22, not working=41. <i>Traumatic (n=131):</i> Mean age=35.82yr; Gender: males=91, females=40; Level of injury: paraplegia=98, tetraplegia=33; Severity of injury: complete=83, incomplete=48; Work status: working=98, not working=33.</p> <p><b>Intervention:</b> No intervention. Records of people with SCI were retrospectively reviewed.</p> <p><b>Outcome Measure:</b> FIM scores, complications.</p>	<ol style="list-style-type: none"> <li>Traumatic SCI group was significantly different from non-traumatic SCI group in:</li> <li>Admission FIM scores were lower in traumatic (74.32) versus non-traumatic (89.68) SCI group (p=0.004).</li> <li>FIM efficiency scores were higher in traumatic (0.15) versus non traumatic (0.07) SCI group (p=0.04).</li> <li>No significant difference was seen between the two groups in: <ul style="list-style-type: none"> <li>Discharge FIM scores between the two groups (p=0.303).</li> <li>LOS values (p=0.565).</li> </ul> </li> <li>Most common complication in non-traumatic group was UTI.</li> </ol>
<p><a href="#">Yokoyama et al.</a> (2006) Japan Case control N<sub>Initial</sub>=34, N<sub>Final</sub>=34</p>	<p><b>Population:</b> <i>SCI due to aortic aneurysm:</i> Mean age=58.6yr; Level of injury: T=17; Severity of injury: AIS A=8, B=2, C=3, D=4. <i>Traumatic SCI:</i> Mean age=57.2yr; Level of injury: T=17; Severity of injury: AIS A=8, B=2, C=3, D=4.</p> <p><b>Intervention:</b> No intervention. Data of patients with spinal cord injury associated with aortic aneurysm repair (SCI-AA) was compared to those with traumatic spinal cord injury (SCI). All patients had previously underwent a rehabilitation program consisting of 40 min of PT, 40 min of OT and 40 min of rehabilitation sports therapy per day for 5 days a wk.</p> <p><b>Outcome Measures:</b> FIM, LOS, discharge, complications.</p>	<ol style="list-style-type: none"> <li>No significant difference was seen between the two groups in their LOS in the acute or rehabilitation hospital.</li> <li>The two groups showed no difference in admission FIM scores; however, SCI group had significantly greater discharge FIM total scores (p=0.02), motor scores (p=0.03), total change (p=0.03), motor change (p=0.03) and efficiency (p&lt;0.01). FIM cognitive score and cognitive change did not show significant differences.</li> <li>Of all the medical complications and comorbidities only hypertension and cardiac disease were seen to be significantly higher in the SCI-AA group compared to the SCI group (p=0.01).</li> <li>The amount of PT and OT was not significantly different between the two groups, while the SCI group was the only group receiving rehabilitation sports therapy.</li> </ol>
<p><a href="#">McKinley et al.</a> (2002) USA Case Control N<sub>Initial</sub>=381, N<sub>Final</sub>=183</p>	<p><b>Population:</b> Non-traumatic SCI secondary to stenosis (n=81) versus traumatic SCI (n=102) within a single centre; Matching from N=381 sample on</p>	<ol style="list-style-type: none"> <li>As compared to those with trauma (before matching), those with stenosis were significantly (p&lt;0.01): <ul style="list-style-type: none"> <li>Older (64.1 versus 44.4).</li> </ul> </li> </ol>

	<p>paraplegia versus tetraplegia and completeness.</p> <p><b>Intervention:</b> No intervention. Various outcomes associated with non-traumatic (stenosis) versus traumatic SCI rehabilitation were compared. Outcome measures were collected at admission to and discharge from rehabilitation.</p> <p><b>Outcome Measures:</b> LOS, charges, Discharge rates to home, FIM (score, change and efficiency).</p>	<ul style="list-style-type: none"> <li>• More likely female (38.8 versus 21.2%)</li> <li>• More likely to have paraplegia (69.4% versus 45.5%)</li> <li>• More likely to be incomplete injury (AIS C or D) (100% versus 49.3%)</li> </ul> <ol style="list-style-type: none"> <li>1. As compared to those with trauma (after matching), those with stenosis had significantly (<math>p&lt;0.05</math>): <ul style="list-style-type: none"> <li>• ↓ LOS (22.1 versus 32.2 days)</li> <li>• ↓ charges</li> <li>• ↑ admission FIM and FIM motor scores</li> <li>• ↓ total and motor FIM change and FIM efficiency</li> <li>• No difference in discharge FIM totals</li> <li>• No difference in discharge destination.</li> </ul> </li> </ol>
<p><a href="#">McKinley et al.</a> (2001) USA Case Control <math>N_{Initial}=174</math>, <math>N_{Final}=174</math></p>	<p><b>Population:</b> Non-traumatic SCI (<math>n=87</math>) from a single centre versus traumatic SCI (<math>n=87</math>) from the United States Model Systems database; Matched on level and completeness of lesion and age; 2/3rds 30-59yr, 1/3<sup>rd</sup> 60+ yr; 93% were admitted within 21 days of injury; 68% were paraplegic; AIS C 36%, AIS D 41%. Outcomes were collected at admission to and discharge from rehabilitation.</p> <p><b>Intervention:</b> No intervention. Outcomes associated with non-traumatic versus traumatic rehabilitation.</p> <p><b>Outcome Measures:</b> LOS, charges, motor FIM (score, change and efficiency).</p>	<ol style="list-style-type: none"> <li>1. As compared to those with trauma (after matching), those with non-traumatic SCI had: <ol style="list-style-type: none"> <li>1. ↓ rehabilitation LOS (22.46 versus 41.49days) (<math>p=0.000</math>)</li> <li>2. ↓ overall charges (<math>p=0.003</math>) and ↓ daily charges (<math>p=0.019</math>)</li> <li>3. No difference on motor FIM at admission and motor FIM efficiency with rehabilitation</li> <li>4. ↓ motor FIM at discharge and ↓ motor FIM change</li> <li>5. No difference in discharge destination.</li> </ol> </li> </ol>
<p><a href="#">McKinley et al.</a> (1999) USA Case Control <math>N_{Initial}=4035</math>, <math>N_{Final}=58</math></p>	<p><b>Population:</b> Non-traumatic SCI secondary to neoplastic cord compression admitted over 5yr (within a single centre (<math>n=29</math>) versus traumatic SCI (<math>n=29</math>) from the United States Model Systems database matched by age, level of injury and AIS; Age =57.8 years; AIS A-D; C4-L2.</p> <p><b>Intervention:</b> No intervention. Various outcomes associated with rehabilitation care of non-traumatic (neoplastic cord compression) versus traumatic SCI. Outcome measures were collected at admission to and discharge from rehabilitation.</p> <p><b>Outcome Measures:</b> LOS, Discharge destination, FIM (total score, change and efficiency).</p>	<ol style="list-style-type: none"> <li>1. As compared to those with trauma (before matching), those with neoplastic cord compression were: <ul style="list-style-type: none"> <li>• Older (57.8 versus 30.45).</li> <li>• More likely to have paraplegia (88.2% versus 52.5%)</li> <li>• More likely to be incomplete (88.2% versus 56.7%)</li> </ul> </li> <li>2. As compared to those with trauma (after matching), those with neoplastic cord compression: <ul style="list-style-type: none"> <li>• Had ↓ LOS (25.17 versus 57.46 days)</li> <li>• Had ↓ motor FIM change</li> <li>• Had ↓ motor FIM scores at discharge</li> <li>• No different FIM efficiency</li> <li>• No different for discharge destination.</li> </ul> </li> </ol>
<b>Non-Traumatic</b>		
<p><a href="#">Gupta et al.</a> (2009) India Observational</p>	<p><b>Population:</b> Mean age=30.64yr; Gender: males=28, females=36; Level of injury: paraplegia=67.2%, tetraplegia=32.8%; Duration of illness=7.1±9.2mo.</p>	<ol style="list-style-type: none"> <li>1. LOS was 55.8±40.9 days (Range 14-193 days).</li> <li>2. BI scores showed significant functional recovery (<math>p=0.000</math>).</li> </ol>

<p>N<sub>Initial</sub>=64, N<sub>Final</sub>=64</p>	<p><b>Intervention:</b> No intervention. Admission/discharge data for non-traumatic patients admitted for neurological rehabilitation from June 2005 to January 2008 was analyzed. <b>Outcome Measures:</b> Functional (BI) and neurological (AIS) outcomes and complication prevalence collected at admission and discharge.</p>	<ol style="list-style-type: none"> <li>3. AIS score showed significant neurological recovery during rehabilitation (p=0.001).</li> <li>4. # of patients at AIS A went from 31.3% to 18.8%, AIS B from 20.3% to 7.8% and AIS C/D from 48.4% to 73.4% between admission and discharge.</li> <li>5. 90% of patients reported at least one complication during rehabilitation.</li> <li>6. Most common medical complications were UTI (50.0%), spasticity (35.9%), urinary incontinence (31.3%) and pressure ulcer (25.0%).</li> </ol>
<p><a href="#">New et al.</a> (2005) Australia Case Series N<sub>Initial</sub>=70, N<sub>Final</sub>=62</p>	<p><b>Population:</b> <i>Non-traumatic SCI:</i> Mean age=69yr; Level and severity of injury: AIS B-D, tetraplegia=32.9%, AIS A, paraplegia=8.6%, AIS B-D=58.6%; Time since injury: &lt;7 days=78.6%; Time to rehabilitation=30.9 days. <b>Intervention:</b> No intervention. Outcomes associated with non-traumatic SCI rehabilitation were assessed. <b>Outcome Measures:</b> Demographics, clinical characteristics, LOS, Discharge setting, level of lesion and AIS, FIM, mobility, bowel and bladder function. Collected at admission to and discharge from rehabilitation.</p>	<ol style="list-style-type: none"> <li>1. LOS =55.8 days (7-413 days).</li> <li>2. ↑FIM motor scores during rehabilitation from 40.8 to 67.1, cognitive FIM showed no change due to initial ceiling effect.</li> <li>3. 17.7% overall and 26.9% over the age of 70 were discharged to a nursing home.</li> <li>4. Those subjects male, younger, more mobile, more independent bowel and bladder function and less severe AIS grades were more likely to be discharged home.</li> <li>5. Major non-traumatic classifications were tumour (32.9%), degenerative (25.7%), vascular (14.3%) and other (27.1%).</li> </ol>
<p><a href="#">Citterio et al.</a> (2004) Italy Case Series N<sub>Initial</sub>=323, N<sub>Final</sub>=323</p>	<p><b>Population:</b> <i>Non-traumatic SCI:</i> Mean age=55yr; Level of injury: cervical=72, thoracolumbar=251; Severity of injury: complete=79, incomplete=244; Etiology of injury: inflammatory=63, vascular=81, neoplastic=81, degenerative=60, other=38. <b>Intervention:</b> No intervention. Patients with non-traumatic SCI involved in rehabilitation were recruited and clinical data was analyzed. <b>Outcome Measures:</b> LOS, AIS grade, complications, discharge destination.</p>	<ol style="list-style-type: none"> <li>1. Mean LOS was 73.5 days; patients having complete cervical lesions had significantly (p&lt;0.0026) longer mean LOS (107.9 days).</li> <li>2. No significant difference was seen in LOS between men and women.</li> <li>3. AIS grade B was significantly related to longer LOS (p&lt;0.0001).</li> <li>4. Living outside the rehabilitation centre district was related significantly to longer LOS (p&lt;0.016).</li> <li>5. Having at least 1 complication on admission was significantly related to longer LOS, pressure ulcers (p&lt;0.03) or DVT (p&lt;0.014).</li> <li>6. 73% of patients were discharged home.</li> <li>7. 20% of patients were transferred to other hospitals for specialized rehabilitation.</li> <li>8. 3.3% of patients were admitted to nursing homes.</li> <li>9. Discharge to home was predicting by marital status, incompleteness of lesion, clinical improvement, efficient bowel and bladder management, absence of pressure ulcers and longer LOS.</li> </ol>
<p><a href="#">Van der Putten et al.</a> (2001) England, UK Case Series N<sub>Initial</sub>=100, N<sub>Final</sub>=100</p>	<p><b>Population:</b> <i>Non-traumatic SCI:</i> mean age=55yr; Gender: male=54%; Level of injury: cervical=49%, upper thoracic=21%, lower thoracic and</p>	<ol style="list-style-type: none"> <li>1. LOS =31.5 days (9-184 days).</li> <li>2. Higher FIM motor score was associated with lower score on admission and reduced time between</li> </ol>

	<p>lumbar=22%; Time from onset to rehabilitation=4.8yr.</p> <p><b>Intervention:</b> No intervention. Optimal outcomes were regressed against various factors associated with non-traumatic rehabilitation.</p> <p><b>Outcome Measures:</b> Demographics, clinical characteristics, level of lesion and AIS, FIM motor score and change score. Collected at admission to and discharge from rehabilitation.</p>	<p>onset-admission (overall predictive model).</p> <p>3. Age (i.e., younger), etiology (i.e., hereditary pathology) and lesion level (i.e., cervical) were individually associated with improved functional outcomes but did not improve prediction of overall model.</p>
<p><a href="#">McKinley et al.</a> (1996) USA Case Series N<sub>Initial</sub>=32, N<sub>Final</sub>=20</p>	<p><b>Population:</b> Non-traumatic SCI secondary to neoplastic cord compression admitted over 5yr within a single centre; Mean age=64yr; Gender: male=18. Female=14.</p> <p><b>Intervention:</b> No intervention. Outcomes associated with rehabilitation care were assessed.</p> <p><b>Outcome Measures:</b> Medical complications, AIS, LOS, bladder function, FIM, Discharge destination. All collected at admission to and discharge from rehabilitation. Level of ambulation and dressing ability assessed at 3-15mo post-discharge.</p>	<p>1. LOS =27 days (7-54 days).</p> <p>2. People showed significant ↑ in 9 FIM categories (0&lt;0.005) associated with mobility and self-care during rehabilitation.</p> <p>3. 11 individuals improved from AIS C to D at discharge.</p> <p>4. 27/32 were discharged home, 4 transferred for medical reasons (and died within 2mo) and 1 died before discharge.</p> <p>5. Of 20 people with assessed at 3-15 mo follow-up, 16 had maintained mobility and dressing function as compared to discharge. However, 12/20 had eventually died at a mean of 101 days post-discharge.</p>