

Research Summary – Trunk Control Test for Individuals with a SCI (TCT-SCI) – Balance

Author Year Country Research Design Setting	Demographics and Injury Characteristics of Sample	Validity	Reliability	Responsiveness Interpretability
Quinzaños-Fresnedo et al. 2024 Observational, comparative, and transversal study to identify the cut-off points in the Trunk Control Test (TCT) for individuals with SCI to determine the ability to perform independently the different ADL according to the SCIM-III National Institute of	N=604 participants with SCI 70.6%M, 29.4%F Mean (SD) age 34.5 (14.17) years AIS A (47.1%), AIS B (9.4%), AIS C (23.2%), AIS D (20.2%), and AIS E (0.2%) Injury level: High tetraplegia (C4 and above) (31.4%), low tetraplegia (below C4) (16.1%), high paraplegia (T6 and above) (14.9%), and low paraplegia (below T6) (37.6%) Mean (SD) time since injury was 134 ± 360 days			Cut-off points: It was demonstrated through ROC curves, that there are different cut-off points in the TCT that are sensitive and specific to discriminate individuals that can independently perform the majority of the items (16 of 22) of the SCIM-III versus those who perform tasks with assistance. SCIM-III item - TCT-SCI cut-off score for performing task independently: 1. Feeding - 2 2A. Bathing - 5 2B. Bathing: Lower body - 14

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Rehabilitation, Mexico City				3A. Dressing: Upper body - 6 3B. Dressing: Lower body - 15 4. Grooming - 4 5. Respiration - 1 8. Use of toilet - 18 9. Mobility in bed - 10 10. Transfers: bed- wheelchair - 17 11. Transfers: Wheelchair-toilet/tub - 18 12. Mobility indoors - wheelchair users - 9 13. Mobility for moderate distances - Wheelchair users - 11 14. Mobility outdoors - Wheelchair users - 13 16. Transfers: wheelchair-car - 20 17. Transfers: ground- wheelchair - 19
Paglierani et al. 2023	N=39 participants 29M, 10F	A higher baseline TCT score was associated		Sensitivity to change:

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Prospective cohort study to investigate the sensitivity to change and prognostic validity of Trunk Control Test (TCT) and Thoracic-Lumbar Control Scale (TLC) in terms of mobility in persons with motor complete thoracic SCI Italian SCI rehabilitation facility	Mean (SD) age 38 (13) years Injury level: T1-T4 (n=16), T5-T8 (n=12), T9-T12 (n=11) Median (1stQ-3rdQ) time since injury 2.7 (2.0-4.0) months	with an increase in SCIM III mobility score at discharge and at follow-ups, while the improvement in TCT score between baseline and discharge was not significantly associated with an increase in SCIM III mobility score at the follow-ups.		The TCT score increased by 7.8 points on average (95% CI 6.5–9.1, $p<0.001$) between admission and discharge, and by a further 1.1 points (95% CI 0.2–2.0, $p=0.016$) at the 6-month follow-up. People with a high NLI (T1-T6) had significantly lower TCT scores at baseline as compared to people with a low NLI (T7-T12). In addition, no significant difference was found in the time trend of TCT scores between the two groups ($p=0.375$).
Sato et al. 2023 Psychometric study to	N=30 Mean (SD) age 63.8 (10.7) years 5M, 25F Traumatic tetraplegia	Criterion validity: A moderate correlation was confirmed		The cut-off point for identifying ambulators with SCIs to maximize both sensitivity and

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evaluate the criterion validity of the TASS and the construct validity of the TASS and TCT-SCI Rehabilitation hospital, Japan	(n=15), traumatic paraplegia (n=5), non-traumatic tetraplegia (n=2), traumatic paraplegia (n=8) AIS A (n=6), AIS B (n=0), AIS C (n=8), AIS D (n=16) Mean (SD) time from onset to assessment 1142.0 (1720.7) days	between the TASS and the TCT-SCI ($r=0.68$). Construct validity: Moderate-to-high correlation coefficients were revealed with the LEMS ($r_s=0.51$ [0.30-.79]), the UEMS ($r_s=0.82$ [0.73-0.93]), the WISCI-II ($r_s=0.42$ [0.14-0.71]), and mFIM ($r_s=0.72$ [0.62-0.90]).		specificity was 18 of the possible 24 points (specificity: 60.0, sensitivity: 80.0), and the AUC was 0.76 (95%CI: 0.59–0.93). The AUCs identifying ambulators showed the a priori expected moderate accuracy.
Sato et al. 2022 Cross-sectional study to evaluate the reliability and calculate the measurement error of the Trunk Assessment Scale for Spinal Cord Injury	N=9 8M, 1F Mean (SD) age 64.0 (11.2) years Etiology: Traumatic (n=7), non-traumatic (n=2) Diagnosis: Cervical cord injury (n = 3), cervical spondylotic myelopathy (n=1), thoracic cord injury (n=5)		Inter-rater reliability: ICC=1.00 (0.99, 1.00) The kappa coefficients were excellent for 12 items ($\kappa=0.83$–1.00) and below acceptable for 1 item ($\kappa=0.68$). The SEMs of the total scores obtained from the inter-rater reliability was 0.41	

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(TASS) and trunk control test (TCT-SCI) in individuals with SCI Rehabilitation Hospital in Japan	AIS A (n=3), AIS B (n=0), AIS C (n=2), AIS D (n=4) Mean (SD) time from onset to assessment 3515.9 (5984.2) days		points, and the MDC ₉₅ was 1.13 points. Intra-rater reliability: ICC=1.00 (-). The kappa coefficients were excellent for 13 items ($\kappa=1.00$).	
Quinzaños et al. 2014 Descriptive, observational and transversal study to propose and validate a trunk control test in individuals with SCI National Institute of	N=177 patients 72.9%M, 27.1%F Mean (SD) age 38.1 (14.29) years AIS A (53.1%), AIS B (18.6%), AIS C (17.5%), and AIS D (10.7%) Injury level: Cervical (39.5%), high thoracic (32.2%), low thoracic (22%), and lumbar (6.2%) Mean (SD) time since injury 6.65 (8.38) months	Construct validity: Correlation with SCIM: $r_s=0.873$ ($p=0.001$)	Test-retest reliability: $K_w = 0.99$ Inter-rater reliability: $K_w = 0.987$ Internal consistency: $\alpha = 0.98$	A receiver operating characteristic curve was plotted for optimizing the instrument's cutoff point, which was determined at 13 points, with a sensitivity of 98% and a specificity of 92.2%. Authors calculated the sensitivity to change as the risk of having adequate trunk control

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Rehabilitation, Mexico				increases 1.846 times with every point increase in the test.

Research Summary – Trunk Control Test for Individuals with a SCI (TCT-SCI) – Other Physiological Systems – Cross-cultural Validation Studies

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Candoni et al. 2024 Argentina- Spanish translation of the TCT-SCI	Cross-cultural adaptation study: N = 30 Reliability study: N = 55 Total sample: Mean (SD) age: 39.7 (15.66) years ASIA A (n = 21), ASIA B (n = 7), ASIA C (n = 11), ASIA D (n = 16) Tetraplegia (n = 19), paraplegia (n = 36)		Inter-rater reliability: Total TCT-SCI: ICC = 0.50 Intra-rater reliability: Total TCT-SCI: ICC = 0.45	