

**Research Summary – Spinal Cord Ability Ruler (SCAR): interval scale to measure volitional performance after SCI – Other Physiological Systems**

Author Year Country Research Design Setting	Demographics and Injury Characteristics of Sample	Validity	Reliability	Responsiveness Interpretability
<p><a href="#">Chaidaroon et al.</a> 2023</p> <p>Retrospective cohort study.</p> <p>Rehabilitation ward at Maharaj Nakorn Chiang Mai Hospital, Thailand</p>	<p>N = 311 participants with SCI (224M, 87F)</p> <p>Mean (SD) age 47.7 (16.3) years</p> <p>Median (IQR) time since SCI of 84.4 (19–87) days.</p> <p>Etiology: Traumatic (n = 208), non-traumatic (n = 103)</p> <p>Tetraplegia (n = 137), paraplegia (n = 174) AIS A (n = 98), AIS B (n = 46), AIS C (n = 69), AIS D (n = 98), AIS E (n = 0)</p>		<p>Test–retest reliability: ICC = 0.998</p>	<p><b>The MCID and MDC:</b> The approx value and range of MCID value of each subgroup was:</p> <ul style="list-style-type: none"> <li>- Approx. 4 with a range of 0.4 to 4.45 for individuals with C5–C8 AIS A, B and C.</li> <li>- Approx. 4 with a range of 0.39 to 4.35 for individuals with C1-C4 AIS A, B and C.</li> <li>- Approx. 4 with a range of 0.37 to 4.15 for individuals with AIS D at any injury level.</li> <li>- Approx. 2 with a range of 0.2</li> </ul>

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				<p>to 2.2 for individuals with TI- S3 AIS A, B and C.</p> <p>MDC95 value of each subgroup was:</p> <ul style="list-style-type: none"> <li>- 1.10 for individuals with C5-8 AIS A, B and C.</li> <li>- 1.08 for individuals with C1-4 AIS A, B and C.</li> <li>- 1.03 for individuals with AIS D at any level.</li> <li>- 0.55 for individuals with TI-S3 AIS A, B and C.</li> </ul>
<p><a href="#">Reed et al.</a> 2017</p> <p>Retrospective statistical analysis of</p>	<p>Final scale metrics included: 7518 records from 2777 participants</p>	<p>As SCAR was determined to be an interval-level scale and Rasch analysis was used to create a total</p>	<p><b>Internal consistency:</b> PSI (measure analogous to</p>	<p><b>Floor/ceiling effects:</b> Ceiling effects of 3% Floor effects of 2.4% observed in the data set.</p>

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<p>database; purpose is to design the validated interval-linear scale to enable more inclusive enrollment of participants in SCI clinical trials</p> <p>Extraction of de-identified data from European Multicenter study about SCI (EMSCI) database.</p> <p>Collected July 2001 – December 2015.</p>	<p>45% tetraplegic; 55% paraplegic individuals Severity: AIS A (45%); B (13%); C (17%); D (24%); E (1%)</p> <p>79% Male participants Age at injury ranged from 13-94.</p>	<p>score for each participant, it is legitimate to combine each participant's score and the difficulty rating of the item on the same scale to inspect scale-to-sample targeting. Beyond targeting, Rasch analysis highlights the strengths and limitations of a scale by demonstrating that items and response options map out along a proper hierarchical 'more than/less than' structure so that intensity of the attribute can always be estimated along a linear continuum.</p>	<p>Cronbach's alpha) = 0.97 (out of 1)</p>	