

ORGANIZATION NEWS

Highlights From the Rehabilitation Measures Database

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Measurement Characteristics and Clinical Utility of the Reintegration to Normal Living Index Among Persons With Spinal Cord Injuries

Nicholas McCombs, BS, Samuel Curry, BA, Edeth Engel, BS, Linda Ehrlich-Jones, RN, PhD

Community reintegration is an important aspect of rehabilitation for people with spinal cord injuries (SCIs). The Reintegration to Normal Living Index (RNLI) is a patient-reported outcomes measure that assesses an individual's ability to resume activities of daily living within the community after a debilitating illness or injury. The RNLI consists of 11 questions, which clinicians or researchers administer via paper and pencil in 5-10 minutes.¹ Patients respond to each question using a visual analog scale numbered 1-10, with 1 being "does not describe my situation" and 10 being "fully describes my situation."^{1(p1969)} The measure is scored as the sum of the patient's answers to all 11 items, with a minimum score of 0 and a maximum score of 110 (100 after score adjustment),² with higher scores indicating a greater amount of patient satisfaction. The RNLI has been shown to be a reliable and valid measure when used in a wide array of patient populations (eg, stroke and cancer).³ In addition, the RNLI has also been demonstrated to have adequate to excellent construct validity,²⁻⁵ excellent internal consistency,^{3,4} excellent content validity,⁴ and excellent item convergent and discriminant validity⁴ for the SCI patient population. SCI-EDGE, a taskforce by the Academy of Neurologic Physical Therapy that uses the Evidence Database to Guide Effectiveness, recommends use of the RNLI with the chronic SCI population and use with any ASIA Impairment Scale classification. In addition, they state that it is appropriate for use with intervention research studies to measure changes.⁶

This abbreviated summary provides a review of the psychometric properties of the Reintegration to Normal Living Index (RNLI) among persons with SCIs. A full review of the RNLI and reviews of over 440 other instruments for patients with various health conditions can be found at: www.sralab.org/Rehabilitation-Measures.

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This instrument summary is designed to facilitate the selection of outcome measures by clinicians. The information contained in this summary represents a sample of the peer-reviewed research available at the time of this summary's publication. The information contained in this summary does not constitute an endorsement of this instrument for clinical practice. The views expressed are those of the summary authors and do not represent those of authors' employers, instrument owner(s), the *Archives of Physical Medicine and Rehabilitation*, the Rehabilitation Measures Database, or the United States Department of Health and Human Services. The information contained in this summary has not been reviewed externally.

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BIBLIOGRAPHY

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		Measure Name:		Summary Authors:													
		Reintegration to Normal Living Index		Nicholas McCombs, BS, Samuel Curry, BA, Edeth Engel, BS, Linda Ehrlich-Jones, PhD, RN													
Populations Reviewed:		Administration Time:		Items:													
Spinal Cord Injury		5-10 minutes		11													
Acronym: RNLI or RNL																	
Purpose and Administration Instructions:																	
<p>Quantitatively assesses the degree to which individuals who have experienced traumatic or incapacitating illness achieve reintegration into normal social activities.</p> <ul style="list-style-type: none"> The first 8 items represent 'daily functioning' and the remaining 3 items represent 'perception of self.' Patients respond to each question using visual analogue scale – numbered 1 through 10.¹ 																	
Normative Data:			Required Equipment:		Score:												
<table border="1"> <thead> <tr> <th colspan="3">Normative Data for Chronic SCI (n=98; mean age 45.2)²</th> </tr> <tr> <th>Instrument</th> <th>Mean (SD)</th> <th>Range</th> </tr> </thead> <tbody> <tr> <td>RNLI</td> <td>23.05 (13.54)</td> <td>3-78.36</td> </tr> </tbody> </table>			Normative Data for Chronic SCI (n=98; mean age 45.2) ²			Instrument	Mean (SD)	Range	RNLI	23.05 (13.54)	3-78.36	Pencil / Response Form		Min 0/ Max 100			
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RNLI	17.2 (4.4)																
			<p>Construct Validity <i>Excellent</i> correlation between RNL and Quality of Life Index (QLI) ($r = -0.654$)² <i>Adequate</i> correlation between RNL and Functional Independence measure (FIM) ($r = -0.348$)² <i>Poor</i> correlation between RNL and American Spinal Injury Association (ASIA)² <i>Adequate</i> correlation with Dejong and Hughes' classification system of productivity status ($r = -0.40$)⁵ <i>Excellent</i> item loadings (ICC=0.86-0.93)³</p>														
Reliability:			Content Validity														
<p><i>Excellent</i> internal consistency ($\alpha = 0.87, \alpha = 0.974$)^{3,4} Test-retest reliability difficult to establish due to natural behavior shifts such as community participation, social, and recreational activities change³</p>			Item Discriminant Validity														
			Discriminant validity established (Fisher's $z > 1.96$) ³														
			Item Convergent Validity														
			<i>Excellent</i> item-total correlation (0.73-0.91) ³														
Recommendations by SCI EDGE:			Scoring Information:														
<p>Recommended for use with chronic SCI (>6 months post-injury), and with AIS A/B/C/D. It is appropriate for use in intervention research studies and PT students should be exposed to the tool, however learning to administer is not required. Recommended for use, but limited study in target group with acute and subacute SCI (<6 months post injury).⁶</p>			<ul style="list-style-type: none"> Higher scores indicate greater community and social involvement by the patient post-injury. (Sum of 11 Items/110) x 100 = score out of 100¹ 														
Alternative Versions:			Floor / Ceiling Effects:														
3-point and 4-point scale versions exist. They are considered to be less-sensitive to change but appropriate for routine use in SCI population. ⁴			No floor or ceiling effects observed ²														
Abbreviations:			Cut-off Criteria:														
RNL/RNLI=Reintegration to Normal Living Index SD= Standard Deviation ICC=Intraclass Correlation Coefficient			<table border="1"> <thead> <tr> <th></th> <th><i>r</i></th> <th>ICC</th> </tr> </thead> <tbody> <tr> <td>Excellent</td> <td>$\geq .6$</td> <td>$\geq .75$</td> </tr> <tr> <td>Adequate</td> <td>.31-.59</td> <td>.40 -.74</td> </tr> <tr> <td>Poor</td> <td>$\leq .3$</td> <td>$< .4$</td> </tr> </tbody> </table>				<i>r</i>	ICC	Excellent	$\geq .6$	$\geq .75$	Adequate	.31-.59	.40 -.74	Poor	$\leq .3$	$< .4$
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Training Required:																	
None Required																	