



Database of Knowledge Translation Tools

Intervention Summary

1. Locomotor Capabilities Index 5 (LCI-5), Lower Extremity Amputations

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2. Instrument Description and Administration Instructions

Purpose of the LCI-5:

- a condition specific questionnaire to assess ability to perform activities with prostheses in people with lower limb amputation (LLA) (Grisé et al. 1993).
- includes 14 questions about locomotor capability when using prosthesis (Franchignoni et al. 2004)
 - 7 questions about basic activities
 - 7 questions about advanced activities
 - 5 response categories (“no”, “yes, if someone helps me”, “yes, if someone is near me”, “yes, alone, with ambulation aids” and “yes, alone, without ambulation aids”)

Type of assessment: patient-reported outcome measure

Administration instructions: Written instructions state “Whether or not you wear your prosthesis, at the present time, would you say that you are “able” to do the following activities WITH YOUR PROSTHESIS ON? Please circle the number that best describes your capability.”

Scoring: Add score for each item to obtain total score. Minimum score = 0; Maximum score = 56 (28 per subscale)

Standardization procedures: No standardized procedure.

ICF Domain: Activity level

Construct: Locomotor capability when using a prosthesis

3. Clinical Considerations and Recommendations

Knowledge Expert group recommendation for application to regional health authority:

There is not enough evidence to make a recommendation for LCI-5 for the assessment of prosthetic users in Norway at this time. However, it is important to note that the HELFO requires use of the LCI-5 for programs they fund.

Considerations:

- A ceiling effect (>20%) is present in high functioning patients. For this reason, the LCI-5 is most applicable to individuals with lower levels of function who have difficulty with transfers, walking around the home, walking on uneven surfaces, ascending/descending stairs, and carrying objects while walking.

- Several versions of the LCI have been studied, these have different scales, different amounts of response categories, and a different number of items. Versions tested include the LCI, LCI-5, and LCI-10-4.
- No studies have been published on the Norwegian translation, it is based on a master degree thesis at University of Strathclyde. However, the thesis was not published in a peer-reviewed journal and is difficult to locate in the public domain.
- Several translations of the LCI have been published. However, little detail on the translation processes have been provided in the articles.

4. Interpretation of Results

Standard Error of Measurement (SEM):

Persian Translation: (Mahyar Salvati & al, 2010)

- Total score: 1.99 points
- Basic activities: 0.99 points
- Demanding activities: 1.37 points

Finnish translation (Becker P & al, 2016)

- Total score: SEM 3.4 (95% CI 3.0-4.0)

Minimum Detectable Change (MDC):

Persian Translation: (Mahyar Salvati & al, 2010)

- Total score: 5.5 points
- Basic activities: 2.74 points
- Demanding activities: 3.79 points

Minimal Clinical Important Difference (MCID): No MCID values identified

Normative Values: No normative values identified

Cut-off scores: No cut off scores given, however, see discriminate validity section below for further information.

5. Clinical Utility

Cost: Published in journals, appears to be free. However, actual cost is not known.

Equipment required: No equipment required.

Number of items: 14 items

Time to administer: 5 to 10 minutes

Training required: No training required

6. Application to specific patient diagnoses

Populations reviewed in this summary: Prosthetic users only.

Other populations assessed with this instrument: No other populations assessed.

7. Psychometric Properties

Reliability: (excellent = >0.75 ; adequate = 0.4 to 0.74; poor < 0.4)

- **Test-Retest Reliability**
 - Persian Translation: (Mahyar Salvati & al, 2010): *Excellent test-retest reliability* (ICC = .96) for the LCI-5 total index.
 - Italian Translation: (Franchigoni et al, 2004):
 - *Excellent test-retest reliability* (ICC = 0.984)
 - Bland altman plot revealed only 2 data points outside of the 95% limits of agreement, indicating $>95\%$ consistency in the majority of participant responses
 - Finnish translation (Becker P & al, 2016)
 - *Excellent test-retest reliability* (ICC = 0.95; 95% CI 0.93-0.96) (7 day interval between tests)
- Internal Consistency (Cronbach's alpha criteria: excellent $>.8$; adequate $<.8$ and $>.7$; poor $<.7$)
 - Persian Translation: (Mahyar Salvati & al, 2010):
 - Basic activities: *Excellent internal consistency* (Cronbach's alpha = 0.87)
 - Demanding activities: *Excellent internal consistency* (Cronbach's alpha = 0.92)
 - Italian Translation: (Franchigoni et al, 2004):
 - Total score: *Excellent internal consistency* (Cronbach's alpha = 0.95)
 - Finnish translation (Becker P & al, 2016)
 - *Excellent internal consistency* (Cronbach's alpha = 0.96 (95% CI 0.95-0.97)

Validity: (excellent > 0.6 ; adequate is 0.31 to 0.59; poor ≤ 0.30)

- Predictive Validity: Not established
- Concurrent Validity: Not established
- Convergent Validity: Not established
- Discriminant Validity: LCI-5 score discriminates between transtibial and transfemoral amputees (although actual data for LCI-5 not reported by group; Franchigioni & al, 2004)
- Content Validity: Not established
- Construct Validity
 - Italian Translation: (Franchigoni et al, 2004):
 - *Excellent correlation* between the LCI and LCI-5 (ρ (rho) = 0.788, $p=.0001$)
 - *Excellent correlation* between LCI-5 and timed walk test (seconds) (ρ (rho) = -.708, $p < .0001$)
 - *Excellent correlation* between LCI-5 and the Rivermead Mobility Index (ρ (rho) = .757, $p < .0001$)
 - *Excellent correlation* between LCI-5 and the FIM (ρ (rho) = 0.622, $p < .0001$)
 - Finnish translation (Becker P & al, 2016)
 - *Adequate correlation* between LCI-5 and the 15D Mobility dimension ($r = 0.55$)
 - *Adequate correlation* between LCI-5 and the 15D total score ($r = 0.45$)
 - *Adequate correlation* between LCI-5 and the 15D Usual Activities dimensions ($r = 0.55$)
 - Persian Translation: (Mahyar Salvati & al, 2010):
 - *Excellent correlation* between LCI-5 and the Timed Up and Go ($r = -0.65$, $P < 0.01$)
 - *Excellent correlation* between LCI-5 and the 2-MWT ($r = 0.71$, $P < 0.0$)

Floor and ceiling effects: *Excellent = No floor/ceiling effects; Adequate = Floor/ceiling effects in less than $< 20\%$ of population; Poor = floor/ceiling effects for $> 20\%$ of population)*

- Italian Translation: (Franchigoni et al, 2004): *Poor*, Large percentage of amputees tested experienced ceiling effects on the LCI-5 (21% ceiling effect)

- Finnish translation (Becker P & al, 2016): *Poor*, Large percentage of amputees tested experienced ceiling effects on the LCI-5 (24% ceiling effect)
- Persian Translation: (Mahyar Salvati & al, 2010): *Poor*, Large percentage of amputees tested experienced ceiling effects on the LCI-5 (23.6% ceiling effect)

In addition to the scientific findings in the articles assessed the results at Unicare Bakke (n=340) demonstrates that there is a high percentage of patients reaching a maximum score.

8. Documentation and Clinical Decision-Making Tips:

Sample goals: *When applied at the beginning of the prosthetic training, the LCI allows the clinician and the person with the LLA to set goals and later to review progress during rehabilitation and at follow-up. (Gauthier-Gagnon and Grise, 2006)*

9. Links to other relevant resources:

Websites: <https://journals.sagepub.com/doi/full/10.1080/03093640600818863>

10. References:

Samples:

Italian Translation: (Franchigoni et al, 2004): 50 patients (37 men, 13 women) who underwent prosthetic training after a recent (<1y) unilateral lower-limb amputation at 2 freestanding rehabilitation centers. Median age was 51 years (interquartile range [QR], 38-62y; range: 21-86y). The median initial score on the LCI-5 was a 19/56.

Finnish translation (Becker P et al, 2016; abstract only) 112 adult lower-limb prosthesis users (mean age 64)

Persian Translation: (Salvati et al, 2010): 106 patients with LLA (60 with transtibial, 28 with transfemoral, 10 through the knee, 8 bilateral); average score = 44.8/56 (23.7 on basic, 12.1 on advanced); average 23.5 months post amputation.

References:

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2. Franchignoni F, Orlandini D, Feniero G, Moscato TA. Reliability, validity, and responsiveness of the Locomotor Capabilities Index in adults with lower-limb amputation undergoing prosthetic training. Arch Phys Med Rehabil 2004;85 :7 43 -8.
3. Gauthier-gagnon C. and Grise M. Tools to Measure Outcome of People with a Lower Limb
4. Amputation: Update on the PPA and LCI. JPO Journal of Prosthetics and Orthotics January 2006;18(6):P61-P67 .
5. Mahyar Salvati, Masood Mazaheri, Fatemeh Khosrozadeh, Seyed Mohammad, Ebrahim Mousavi, Hossein Negahban, Hadi Shojaei. The Persian version of locomotor capabilities index: translation, reliability and validity in individuals with lower limb amputation. Qual Life Res (2011) 20: 1.