

## Reference

Highsmith MJ, Kahle JT, Miro RM, Mengelkoch LJ.

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# Ramp descent performance with the C-Leg and interrater reliability of the Hill Assessment Index

Prosthetics and Orthotics International 2013; 37(5):362–368.

## Products

### C-Leg vs NMPKs

## Major Findings

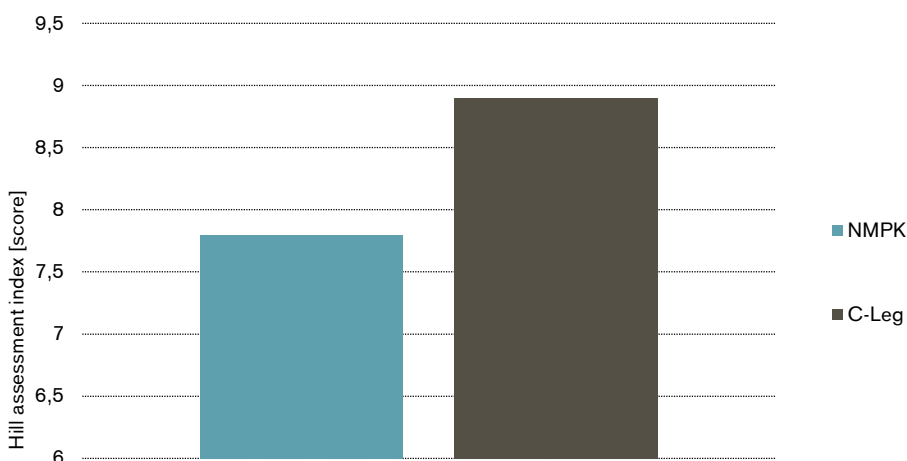
With C-Leg compared to NMPKs:

→ **Improved walking velocity during ramp descent by 23%**

→ **Improved mobility during ramp descent**

Hill Assessment Index score improved from 7.8 to 8.9 (14% increase)

### Improved ramp mobility with C-Leg for descent



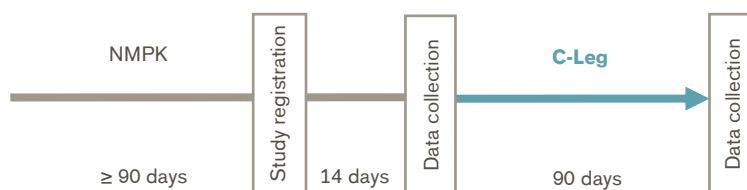
Subjects descended a ramp (4.9 m, 5° slope) with self-selected walking speed and handrail use as they deemed necessary.

## Population

Subjects: 21 unilateral, transfemoral amputees  
Previous prosthesis: NMPKs  
Amputation causes: 38% vascular, 38% trauma, 19% congenital, 5% malignancy  
Mean age: 52.1 yrs ( $\pm$  18.6 yrs)  
Mean time since amputation: not reported  
MFCL: K3 (independent community ambulators)

## Study Design

Interventional, pre- to post-test design:



## Results

Activities								Participation	Environment
Level walking	Stairs	Ramps, Hills	Uneven ground, Obstacles	Cognitive demand	Metabolic energy consumption	Safety	Activity, Mobility, ADLs	Preference, Satisfaction, QoL	Health economics

Category	Outcomes	Results for C-Leg compared to NMPKs	Sig.*
Ramps, Hills	Hill Assessment Index (HAI)	<b>HAI scores increased by 14% (7.8 vs 8.9 points).</b> 8 points represent 'step-to without assistive device' and 9 points represent 'step a little past without assistive device'.	<b>++</b>
	Time to complete ramp task	<b>Time to complete ramp descent decreased (6.0 vs 7.7 s) and therefore walking velocity increased by 23%.</b>	<b>++</b>

\* no difference (0), positive trend (+), negative trend (-), significant (++/--), not applicable (n.a.)

## Author's Conclusion

"This study confirms that accommodation with and use of a C-Leg can improve ramp descent performance at an ADA grade in terms of HAI scores and time to descend the ramp. Relative to ramp descent quality, use of the C-Leg appears to offer the possibility of removing the use of an assistive device when present and/or improving step length from a step to gait pattern to an asymmetric step through pattern in the absence of an assistive device. The use of the C-Leg also resulted in a 23% increase in gait speed during ramp descent." (Highsmith et al. 2013)

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