Reference

Kahle JT, Highsmith MJ, Hubbard SL.

Westcoast Brace and Limb, Tampa, USA.

Comparison of nonmicroprocessor knee mechanism versus C-Leg on Prosthesis Evaluation Questionnaire, stumbles, falls, walking tests, stair descent, and knee preference

Journal of Rehabilitation Research & Development 2008; 45(1):1–13.

Products

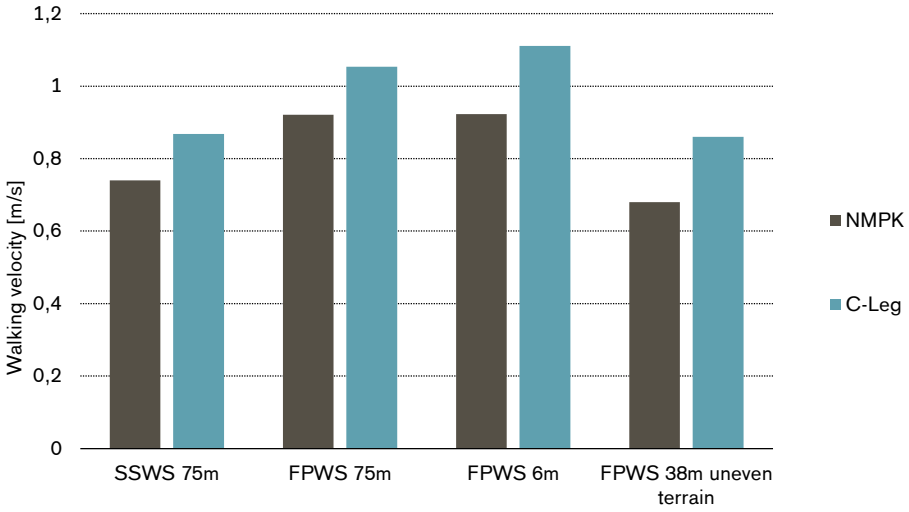
C-Leg vs NMPKs

Major Findings

With C-Leg compared to NMPKs:

→ Falls are reduced by 64% and stumbles are reduced by 59%
→ Satisfaction improved by 20%
→ 74% of subjects prefered using C-Leg over NMPK
→ Improvements of walking velocity by up to 21%
short and long distance
even and uneven terrain
self-selected and fastest possible walking velocity

Improvements of walking velocity with C-Leg



Walking velocity was measured during different walking tasks: self-selected walking speed over 75 meters (SSWS 75m), fastest possible walking speed over 75 meters (FPWS 75m), fastest possible walking speed over 6 meters (FPWS 6) and fastest possible speed over 38 meters on uneven terrain (FPWS 38m uneven terrain).

Population

Subjects:	21 unilateral, transfemoral amputees
Previous prosthesis:	NMPKs
Amputation causes:	33% trauma, 19% congenital, 14% diabetes mellitus, 14% PVD, 5% sarcoma
Mean age:	51 yrs (range from 22 – 83 yrs)
Mean time since amputation:	10 yrs (4 – 20 yrs)
MFCL:	43% K2, 38% K3, 10% K4

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 NMPK	Sig.*
Level Walking	Self-selected (SSWS) and fastest possible walking speed (FPWS)	**SSWS increased by 15 % during 75m test.**	++
		FPWS increased by 12 % during 75m test.	++
		FPWS increased by 17% during 6m test.	++
Stairs	Stair descent test	63% of subjects improved in stair descent performance.	n.a.
Uneven Ground, Obstacle Course	Fastest possible walking speed (FPWS) on uneven terrain	**FPWS increased by 21 % during 38m uneven terrain test.**	++
Safety	Reported stumbles and falls	**The number of self-reported stumbles decreased by 59%**	++
		The number of self-reported falls decreased by 64%.	++
Activity, Mobility, Activities of daily living (ADLs)	Mobility level	42% of subjects improved their mobility level. 53% of subjects stayed at their mobility level. 5% of subjects decreased their mobility level.	n.a.
Preference, Satisfaction, Quality of Life (QoL)	PEQ (Prosthesis Evaluation Questionnaire)	**PEQ total score improved by 20%.**	++
	Preference	74% of the subjects responded that they would prefer using the C-Leg rather than their previous NMPK.	n.a.

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

Author's Conclusion

"Using the C-Leg, most subjects demonstrated greater prosthesis function and prosthesis-related quality of life, decreased self-reported falls and stumbles, increased walking speed under several conditions, and improved stair descent. In addition, most subjects preferred the C-Leg." (Kahle et al. 2008)