

Reference

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Benefits for Adults with Transfemoral Amputations and Peripheral Artery Disease Using Microprocessor Compared with Nonmicroprocessor Prosthetic Knees

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Products

MPKs (C-Leg/C-Leg Compact) vs NMPKs

Major Findings

With MPKs (C-Leg/C-Leg Compact) compared to NMPKs:

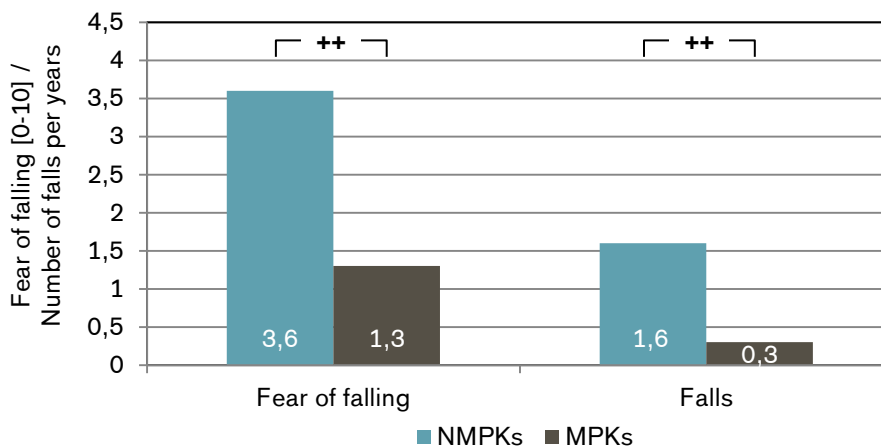
→ **Using MPK instead of NMPK significantly improved the user's safety:**

- Activities-Specific Balance Confidence Scale (ABC): +52.9%
- Timed Up and Go (TUG): -35.9%
- Fear of falling: -65.5%

→ **Significantly reduced rate of falls per year by 84.6% with MPKs compared to NMPKs.**

→ **Users have a tendency to use their prosthesis more often with MPKs than with NMPKs by 30.6%.**

Significantly improved safety with MPKs



++ statistically significant ($p < 0.05$)

Population

Subjects:	Six unilateral, transfemoral amputees and two bilateral transtibial-transfemoral amputees
Previous knees:	NMPKs (Otto Bock: Locking 3R41, 3R60, 3R80; Össur: Mauch Knee, Total Knee 1900&2000)
Testing knees:	Five C-Leg, three C-Leg Compact
Mean age:	60.8 ± 11.3 yrs
Mean time since amputation:	9.5 ± 16.1 yrs
MFCL:	25% K1, 25% K2, 50% K3
Inclusion criteria:	Older than 40 yrs; peripheral artery disease (PAD)

Study Design

Prospective cohort study:



Results

Functions and Activities						Participation			Environment
Level walking	Stairs	Ramps, Hills	Uneven ground, Obstacles	Cognitive demand	Energy	Safety	Activity, Mobility, ADLs	Preference, Satisfaction, QoL	Health Economics

Category	Outcomes	Results for MPK (C-Leg/C-Leg Compact)	Sig.*
Safety	Activities-Specific Balance Confidence Scale (ABC)	The ABC scale was significantly improved by 52.9% with MPKs compared to NMPKs (51.9 ± 32.8). With MPKs the average ABC score was 79.4 ± 15.3, indicating a high level of physical functioning.	++
	Berg Balance Scale (BBS) [0-56]	BBS showed a tendency to be higher by 9% with MPKs (43.9 ± 16.5) compared to NMPKs (40.3 ± 17.8).	+
	Timed Up and Go (TUG) [s]	The time for TUG was shorter by 35.9% with MPKs (21.9 ± 19.5 s) compared to NMPKs (34.1 ± 42.8 s). This improvement exceeded the minimal detectable change. <i>Results were based on n=7. One subject was not able to get up from the chair with NMPK and could not complete the TUG.</i>	++
	Fear of Falling [0-10]	Fear of falling improved by 65.5% with MPKs (1.3 ± 1.8) compared to NMPKs (3.6 ± 2.9)	++
	Number of falls per year	The rate of falls per year decreased significantly by 84.6% (from 1.6 ± 0.7 with NMPKs to 0.3 ± 0.7 with MPKs).	++
Preference, Satisfaction, Quality of Life (QoL)	Houghton prosthetic use [0-12]	The Houghton prosthetic use showed a tendency to be increased by 30.6% with MPKs (8 ± 4.1) compared to NMPKs (6.1 ± 3.8).	+

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

Author's Conclusion

"This study demonstrated that people with PAD and transfemoral amputations may benefit from using prostheses with MK compared with prostheses with non-MK with respect to improving balance confidence and functional walking ability while decreasing the incidence of falls. The significant changes and medium to large effect sizes noted in the physical and psychoemotional domains may help reduce falls in users of prostheses with MK and suggest that further research into the potential benefits of using prostheses with MK by people with PAD and transfemoral amputations is warranted." (Wong et al. 2015)

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