

# C-Leg vs NMPKs

## Preference, Satisfaction, Quality of Life (QoL)

### Major Findings

With C-Leg compared to NMPKs:

→ **More positive body image**

Amputee body image scale (ABIS) score improved by 9.5%.

→ **Improved quality of life and satisfaction**

Prosthesis evaluation questionnaire (PEQ) total score improved by 20%

K2: PEQ subscales ambulation, residual limb health, utility and satisfaction of walking improved

K2: PEQ mobility score improved by 25%

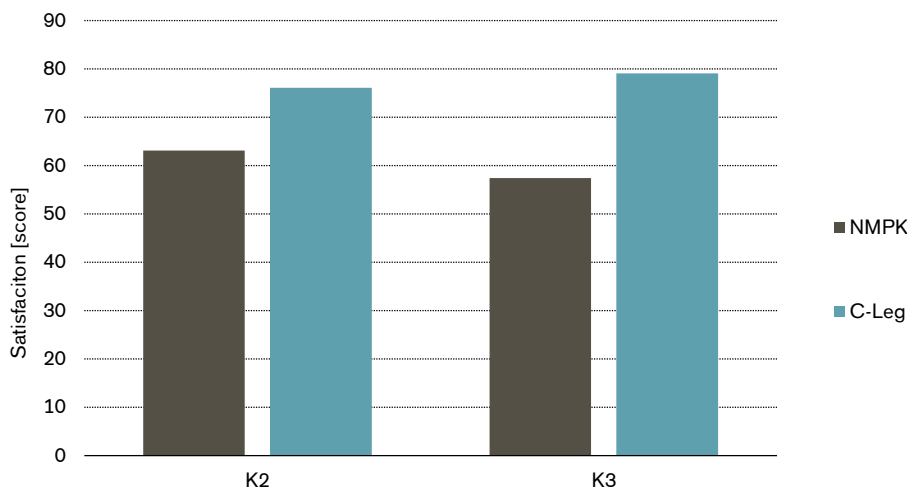
K3: PEQ addendum 'satisfaction' improved by 38%

K3: PEQ subscales ambulation, sounds and utility improved

EQ-5D: Physical mobility and usual activity improved significantly

→ **Up to 88% of subjects preferred C-Leg over NMPK**

### Improved satisfaction with C-Leg



The Prosthesis evaluation questionnaire (PEQ) addendum Satisfaction was measured by visual analogue scale (VAS) with a range from 0 to 100, where 100 represent the maximum score. Subjects were divided in mobility grade K2 and K3 (Hafner et al. 2009).

### Clinical Relevance

Satisfaction and quality of life can be measured to determine the general well-being of a person. They are all very meaningful parameters to investigate, since they have the most direct impact on the amputee's well-being. They are influenced by other categories and can therefore be seen as a summary of possible activities, independence and perceived safety. A common outcome measure in prosthetic research is the Prosthesis Evaluation Questionnaire (PEQ), a questionnaire with a total of 84 items. Several selected items are further used in 9 subscales. Quality of life can be measured by different questionnaires as the EQ-5D, WHO-QOL, SF-36 etc. Often the so called QALYs (quality-adjusted life years) are calculated. They give information of how many time is spent in "perfect health" within a one or five year time period.

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## Summary

Five studies investigated the subject's preference regarding the prosthesis and all of them found clear preference for C-Leg over NMPKs. Orendurff et al. (2006) reported that 88% of subjects preferred to use C-Leg instead of a NMPK. Further results confirmed these findings; 82% of subjects preferred C-Leg and only 6% of subjects preferred NMPCKs, whereas 12% of subjects did not have a preference (Hafner et al. 2007). In another study 74% of subjects reported that they prefer using C-Leg over NMPKs (Kahle et al. 2008). 100% of subjects preferred C-Leg over NMPCKs for descending stairs (Schmalz et al. 2002). Regarding limited community ambulators, 72% of subjects preferred C-Leg, 24% of subjects preferred C-Leg Compact and only 3% of subjects preferred NMPKs (Theeven et al. 2011).

The transition from a NMPK to C-Leg has a positive impact on amputees' body image measured by decreased amputee body image scale (ABIS) score by 9.5% (Bunce et al. 2007). Applying the SF-36 questionnaire, it was found that the score for quality of life is increased with C-Leg compared to norms of people with a limitation in arm or leg use (Seymour et al. 2007). However, in a later study investigating quality of life with the SF-36 questionnaire, no differences between C-Leg and NMPKs were found (Hafner et al. 2007).

Quality of life was investigated by Cutti et al. 2016. The results show a significant advantage of C-Leg over NMPKs in the subscales Physical mobility and Usual activity. They found that the calculated QALYs (quality-adjusted life years) are nearly 10% higher with C-Leg meaning that 33 days more are spent in "perfect health" a year. In 5 years this results in 6 months more "perfect health time".

Prosthesis Evaluation Questionnaire (PEQ) total score was improved by 20% with C-Leg compared to NMPK in a study group including mobility grades K2 – K4 (Kahle et al. 2008). Hafner et al. (2009) found an increase of 38% in PEQ satisfaction score as well as improvements in the subscales ambulation, sounds and utility with C-Leg compared to NMPKs in K3 subjects. For K2 subjects, a difference in PEQ subscales ambulation, residual limb health, utility, and satisfaction with walking was found with C-Leg compared to NMPKs. Kaufman et al. (2008) confirmed improvements in quality of life measured by PEQ: PEQ total score as well as 8 out of the 9 PEQ subscales improved with C-Leg compared to NMPKs (Kaufman et al. 2008). With C-Leg Compact differences were found in the subscales residual limb health and utility (Theeven et al. 2012) as well as in the mobility score (25% higher) (Burnfield et al. 2012). A case report about an adolescent C-Leg user, found that in quality of life inventory of the PedsQL the quality of life score improved by 22%. Furthermore in the multidimensional fatigue scale the fatigue score improved by 32% (Tofts et al. 2013).

Regarding satisfaction with C-Leg and ability of C-Leg to meet their expectations, 53% of subjects reported that their expectations were achieved and 38% of subjects reported that parts of their expectations were achieved. Only 9% of subjects reply was disappointment (Drerup et al. 2008). The responses of a survey on the satisfaction showed clear benefits with C-Leg compared to NMPKs. 88% of subjects rated gait and manoeuvrability as improved, 88% rated confidence and security as improved, 66% rated negative attributes as improved, 73% rated socket fit as improved, 66% rated physical attributes as improved, and 62% of subjects rated physical effects of prosthesis as improved. Overall, 60% of all respondents rated C-Leg as better than their former NMPK in all question categories (Berry et al. 2009).

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