

C-Leg® Microprocessor Knee Research Summary



The Standard of Care

Falling is a major health problem that affects more than 50 million Americans annually.¹⁵ Injuries sustained during a fall often require treatment and may lead to temporary or permanent disability. Studies demonstrate that the amputee population is susceptible to the physical and financial impacts of falling and transfemoral amputee's falling rate is higher than the general amputee population.¹⁵

As a result, with most prosthetic knees users worry about stumbling and falling. This fear causes prosthetic users to compensate with changes in gait and may keep their prosthetic knee straight with each step. C-Leg technology changed that by providing the stability and confidence an amputee needs.

The C-Leg allows the user to seamlessly speed up or slow down, take on hills or slopes, recover from stumbles and go down stairs step-over-step. The application of the science is revolutionary, using microprocessors to control the knee's function. The knee is constantly being fine-tuned to adjust to the user's movements, anticipating what the user is doing and accommodating every change in real-time.

Research proves...

Reduction in Falls

- Falls decreased 64% with C-Leg® microprocessor knee ($p=0.03$).³
- Improved stair descent function with C-Leg ($p<.001$).⁸
- Fewer reported stumbles and falls with C-Leg ($p<.05$).⁸
- Lower frustration with falling and less difficulty multi-tasking while walking with C-Leg ($p<.05$)

Gait and Balance

- Improved equilibrium with C-Leg ($p<.01$).

Energy Expenditure

- Subjects demonstrated significantly increased physical activity-related energy expenditure levels in the participant's free-living environment when using the C-Leg ($p=0.04$).¹
- C-Leg significantly reduced net oxygen consumption at medium and low speeds ($p<.05$).

Cognitive Demand (Mental Energy)

- Perception that walking was easier with the C-Leg ($p=0.02$).¹
- Participants reported paying less attention to walking during cognitive tasks when wearing the C-Leg versus the non-computerized leg ($p<.001$).¹¹
- Subjects reported less cognitive burden when using the C-Leg versus non-microprocessor leg using the Prosthetic Cognitive Burden Scale (PCBS).¹¹

Quality of Life/Body Image

- When using the C-Leg, subjects expressed increased satisfaction in their daily lives ($p=0.02$).¹
- Higher satisfaction with C-Leg ($p<.001$).⁸
- Body Image was significantly improved with C-Leg ($p<.001$). Body function, affect distress and behavioral avoidance subsets were most strongly affected.⁹
- 90% reported improvement in function and transformation in meaning and character of their everyday surroundings.⁹
- 90% reported that C-Leg reduced sense of deficiency and displacement in relation to others. By significantly enhancing the ability to walk C-Leg enabled patients to approach the behavioral pace and performance of able-bodied others.⁹

Cost Effectiveness

- Functional health was clearly higher in those patients wearing a C-Leg.¹⁴
- Total costs for patients wearing a microprocessor based prosthesis appear to be lower than for patients who wore a prosthesis featuring a non-electronically controlled knee joint.¹⁴

References

Research proves the C-Leg offers trans-femoral amputees improved quality of life through reduction in falls, cognitive demand, energy expenditure and improved body image. For a full bibliography of the over 30 studies that have been published on the C-Leg please visit www.clegstories.com.

1 Kaufman, 2008
2 Gerzeli, 2008
3 Kahle, 2008
4 Brodtkorb, 2008

5 Kaufman, 2007
6 Seymour, 2007
7 Schmalz, 2007
8 Hafner, 2007

9 Bunce, 2007
10 Chin, 2006
11 Williams, 2006
12 Klute, 2006

13 Segal, 2006
14 Orendurff, 2006
15 Corso, 2006
16 Miller, 2001



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QUALITY FOR LIFE