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**Reference**

Highsmith MJ, Kahle JT, Wernke MM, Carey, SL, Miro RM, Lura DJ, Sutton BS.  
School of Physical Therapy & Rehabilitation Sciences, University of South Florida,  
Tampa, FL, USA.

## Effects of the Genium knee system on functional level, stair ambulation, perceptive and economic outcomes in transfemoral amputees

Technology and Innovation 2016; 18: 139-150

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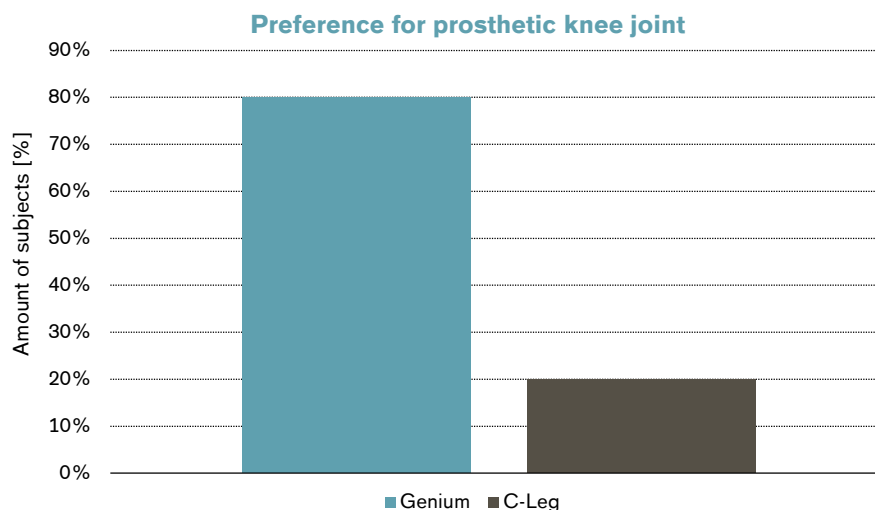
**Products****Genium vs C-Leg**

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**Major Findings**

With Genium compared to C-Leg:

- **The quality of stair ascent and descent improved significantly**
- **Mobility and functional level improved significantly**
- **Perceived function and safety in ADLs was as good as with C-Leg or significantly better**
- **80% preferred Genium**



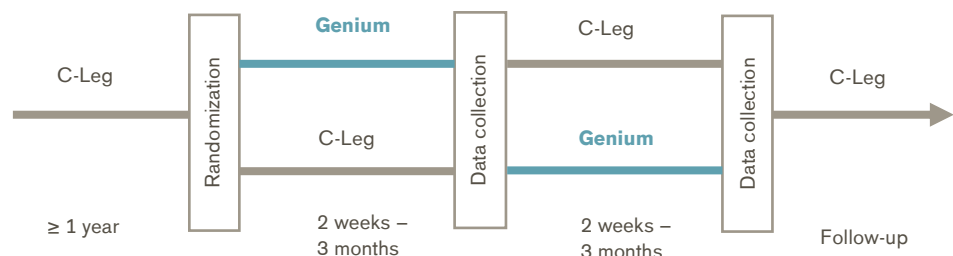
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**Population**

Subjects:	20 unilateral, transfemoral amputees
Previous prosthesis:	C-Leg
Amputation causes:	70% trauma, 20% malignancy, 10% vascular disease
Mean age:	46.5 ± 14.2 yrs
Mean time since amputation:	17.7 yrs ± 15.6 yrs
MFCL:	K3

## Study Design

Interventional, randomized crossover design:



## 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 Genium	Sig.*
Stairs	SAI (Stair Assessment Index)	<b>SAI stair <i>ascent</i> score improved significantly from 6 to 11 points (median).</b>	++
		<b>SAI stair <i>descent</i> median score was 11 for both knee joints. The mean score significantly improved by 9%.</b>	++
		Stair ascent and descent completion time did not differ significantly.	0
Safety	Four Square Step Test	<b>Time to complete the test significantly decreased by 9%.</b>	--
Activity, Mobility, Activities of Daily Living (ADLs)	AMP (Amputee mobility predictor)	<b>Mobility increased significantly by 5%.</b>	++
	Step activity derived functional level	<b>The functional level significantly increased by 6%.</b>	++
	ADL survey	<b>Perceived function and safety in three of five ADL domains improved significantly.</b> The other two domains showed no difference.	++
Preference, Satisfaction, Quality of Life (QoL)	Survey	<b>80% of the participants preferred Genium.</b>	++
Health Economics	ICER (Incremental cost-effectiveness ratio)	The ICER for reimbursing Genium ranges from \$6,000 to \$6,522 per unit of functional increase assuming a \$30,000 intervention cost difference.	n.a.

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

## Author's Conclusion

"Accommodation and use of the Genium knee system compared with C-Leg improved stair walking performance, multi-directional stepping, functional level, and perceived function. Genium was also preferred compared to C-Leg in this group of high functioning community ambulators with unilateral transfemoral amputation. Finally, Genium is a more costly microprocessor knee system but, in this group of patients, is worth funding due to significant differences in functional performance with activities of daily living." (Highsmith et al., 2016)

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