
Reference

Highsmith MJ, Kahle JT, Lura DJ, Lewandowski AJ, Quillen WS, Kim HS.
School of Physical Therapy & Rehabilitation Sciences, University of South Florida,
Tampa, FL, USA.

Stair ascent and ramp gait training with the Genium knee

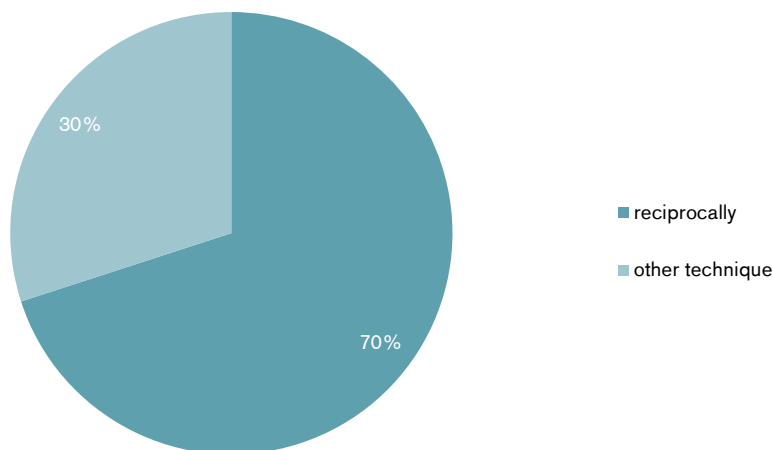
Technology and Innovation 2014; 15(4):349-358.

Products**Genium**

Major Findings

With Genium:

- **70% of subjects are able to climb stairs reciprocally**
- **Ability to cross obstacles improves when subject are able to climb stairs reciprocally**
- **Focal pressure near the anterior aspect of the hip during ramp ascent is experienced as decreased compared to other prosthesis**

Stair climbing technique with Genium**Population**

Subjects:	20 transfemoral amputees
Previous prosthesis:	not reported
Amputation causes:	trauma
Mean age:	not reported
Mean time since amputation:	not reported
MFCL:	K3 – K4 (unlimited community ambulators)

Study Design

Technical report about stair ascent and ramp gait training with Genium

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 Genium	Sig.*
Stairs	Observations	70% of subjects demonstrated ability to climb stairs reciprocally.	n.a.
Ramps, Hills	Observations	Ascent: less focal pressure was experienced by subjects near the anterior aspect of the hip.	n.a.
		Descent: On 5° declines, more active walkers utilized a stepping strategy similar to level walking with two sagittal knee flexion peaks.	n.a.
Uneven Ground, Obstacle Course	Subject's report	Subjects believe that stair climbing practice improved the ability to cross obstacles	n.a.

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

Author's Conclusion

"Technological developments in assistive devices continue to outpace rehabilitation strategies to maximize their utilization and implementation. Clinical rehabilitation techniques remain limited. This technical note presents strategies for training the patient with transfemoral amputation in how to utilize the reciprocal stair ascent and ramp gait functions of the Genium knee. Additional training suggestions for further advanced training with these skills are also discussed. Functional training strategies introduced here were specifically used with the Genium knee in high-functioning patients. Therefore, they may not be appropriate for all patients with transfemoral amputation based on component or functional level. Thus, clinical judgment and patient goals are vital in the decision of whether or not to include such training in the course of an amputee's therapy. We maintain that ramp and stair training in a broader context may be functionally important even if a patient indicates these obstacles are not often encountered in their usual routines. This training is important because it is difficult to determine when daily activities require out-of-the-ordinary settings or present unanticipated challenges. Supervised practice and familiarity may improve safety by decreasing fall risk, should the situation arise." (Highsmith et al., 2014)

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