

## Reference

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# Prevention of Genu Recurvatum in Poststroke Patients Using a Hinged Soft Knee Orthosis

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## Products

### Genu Neurexa

## Major Findings

With Genu Neurexa compared to wearing no orthosis:

→ **Prevention of hyperextension and higher knee flexion angle while walking.**

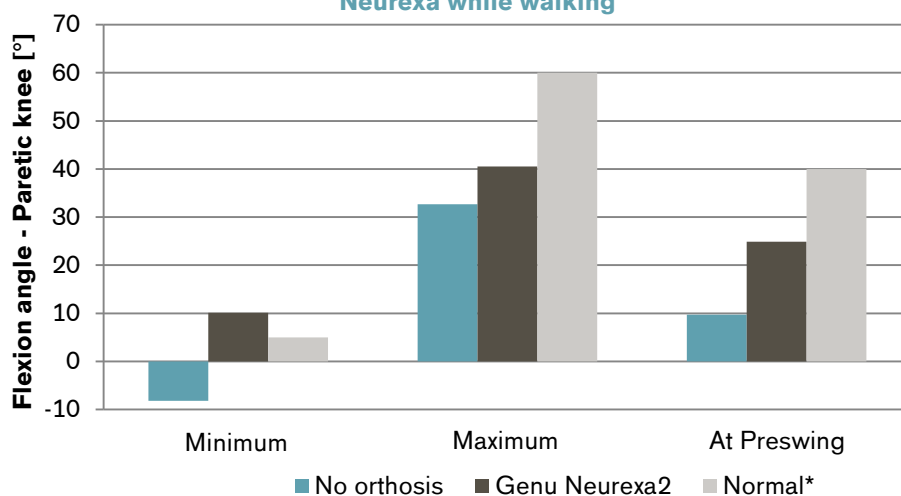
→ **Significant improvement in all Functional Tests when using Genu Neurexa:**

- Berg Balance Scale (BBS): + 7.0%
- 6-Minute Walk Test (6MWT): +16.5%
- 10-Meter Walk Test (10MWT): + 6.9%
- Timed Up and Go Test (TUG): +10.6%

→ **High user satisfaction with an OPUS-Satisfaction with Devices score of  $13.8 \pm 3.9$  (9=very satisfied, 36=very dissatisfied)**

(Average score of the 9 questions is  $1.5 \pm 0.4$ , where 1 reflects very satisfied and 4 very dissatisfied)

Improved knee flexion angle of the paretic knee with Genu Neurexa while walking



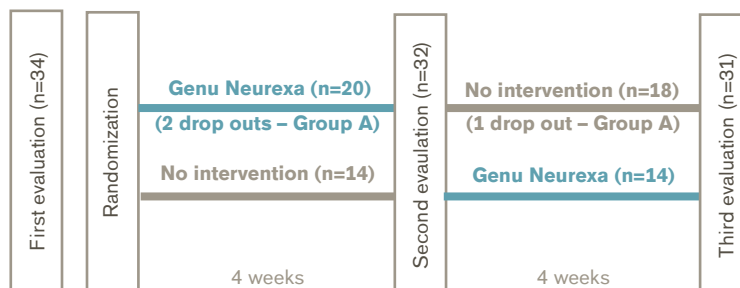
\*Perry, J. (2010). Gait analysis. *Normal and Pathological Function*, 2nd edition.

## Population

Subjects:	31 (23 men, 8 women)
Mean age:	$59.9 \pm 15.1$ years
Mean body mass:	$76.1 \pm 11.7$ kg
Time after stroke:	$6.1 \pm 6.7$ years
NIHSS:	$7.5 \pm 2.1$
(National Institute of Health Stroke Scale)	(Total range from 0 (normal function) to 42 (severe impairment))

## Study Design

Interventional, single crossover with randomization:



## Results

Functions and Activities						Participation
Biomechanics – Static measures	Biomechanics – Gait analysis	X-Ray	EMG	Functional tests	Clinical effects	Satisfaction

Category	Outcomes	Results for Genu Neurexa	Sig.*
Biomechanics – Gait analysis	Sagittal angle of paretic knee	<b>The flexion angle of the paretic knee was significantly higher with Genu Neurexa compared to wearing no orthosis:</b>  <b>Minimum:</b> The hyperextension was prevented with Genu Neurexa compared to wearing no orthosis. <b>Maximum:</b> The maximum flexion angle increased by 23.9% with Genu Neurexa compared to wearing no orthosis. <b>At Preswing:</b> A significantly higher flexion angle (+156.7%) was recorded at Preswing with Genu Neurexa compared to wearing no orthosis.	++
	Spatiotemporal parameters and gait symmetry	No significant differences for the recorded spatiotemporal and gait symmetry results were found.	0
EMG	Activation time and Peak RMS (root mean square)	No differences for paretic and nonparetic leg were found when comparing Genu Neurexa to wearing no orthosis.	0
Functional tests	Berg Balance Scale (BBS)	<b>The BBS was significantly improved by 7% with orthosis compared to wearing no orthosis.</b>	++
	6-Minute Walk Test (6MWT) [m]	<b>The covered distance within 6 minutes increased by 16.5% with Genu Neurexa compared to no orthosis.</b>	++
	10-Meter Walk Test (10MWT) [s]	<b>The users were significantly faster by 6.9% with Genu Neurexa compared to wearing no orthosis.</b>	++
	Timed Up and Go Test (TUG) [s]	<b>The TUG was performed significantly faster by 10.6% with Genu Neurexa compared to wearing no orthosis.</b>	++
Satisfaction	OPUS-(Orthotics and Prosthetics User's Survey) – Satisfaction with Devices	<b>The users rated to be very satisfied with the orthosis with an score of 13.8 ± 3.9, where 9 reflects great satisfaction and 36 great dissatisfaction.</b> <i>(Questionnaire included 9 questions about the orthosis, with an average score of 1.5 ± 0.4)</i>	n.a.

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

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**Author's Conclusion**

“Using a hinged soft knee orthosis to prevent genu recurvatum after stroke may be considered a viable option to prevent falls and fall-related injuries by restoring balance and confidence in the patient and increasing foot clearance” (Portnoy et al. 2015)

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