

Genium X4.

Setting a new standard for MPK performance.

Moves users closer to natural gait with the OPG 3.0

- Makes it easier to move in crowded spaces with a Start-to-Walk feature
- Enables safer, easier backward movement, even when pulling a load
- Gives users even more support when going uphill
- Enables easier walking speed transitions
- Makes biking simpler and safer with an Intuitive cycling function



References

- * All publications compare Genium/Genium X3 to C-Leg.
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- 8. Lura, Derek J.; Wernke, Matthew M.; Carey, Stephanie L.; Kahle, Jason T.; Miro, Rebecca M.; Highsmith, M. Jason (2015): Differences in knee flexion between the Genium and C-Leg microprocessor knees while walking on level ground and ramps. In: Clinical biomechanics (Bristol, Avon) 30 (2), S. 175–181. DOI: 10.1016/j.clinbiomech.2014.12.003.
- 9. Mileusnic, Milana P; Rettinger, Lena; Highsmith, M J & Hahn, A (2021): Benefits of the Genium microprocessor controlled prosthetic knee on ambulation, mobility, activities of daily living and quality of life: a systematic literature review. Disability and Rehabilitation: Assistive Technology, 16:5, 453-464, DOI: 10.1080/17483107.2019.1648570
- 10. Schalk, Stephanie A. F.; Jonkergouw, Niels; van der Meer, Fred; Swaan, Willem M.; Aschoff, Horst-H; van der Wurff, Peter (2015): The Evaluation of Daily Life Activities after Application of an Osseointegrated Prosthesis Fixation in a Bilateral Transfemoral Amputee: A Case Study. In: Medicine 94 (36), e1416. DOI: 10.1097/MD.00000000000001416.
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Genium technology: Clear clinical benefits.

Genium X4 offers advantages that can only come with a knee built on 25+ years of MPK experience. Multiple studies have shown that the Genium Family outperforms previous MPKs in a range of clinically meaningful areas.

Genium/Genium X3 has been proven to*:

Better approximate a natural gait pattern ^{1, 8, 9, 11}

Improve balance and perception of safety ^{2, 5, 7, 9}

Better relieve contralateral limb stress (even when engaging the stance function or performing activities such as step-over-step stair ascent) ^{1, 9}

Enable a smoother and more intuitive gait (even in confined spaces or on uneven ground) ^{1, 2, 7, 8}

Facilitate activities of daily living (ADLs) ^{2, 5, 6, 7, 9}

Significantly increase in several aspects of quality of life ^{3, 9, 10}

Upcoming publication.

Genium X4 users in Germany*

*Publication in preparation

Participants

8 Genium X4 users with prior transfemoral amputation or knee disarticulation

- Everyday prosthesis: Genium X3 (n=7) or Genium (n=1)
- 2 bilateral amputees
- Mobility level 3 (n=2) or 4 (n=6)

Assessments

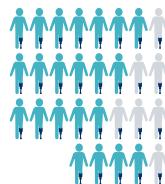
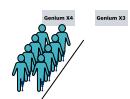
- Subjective perception of safety
- Prosthesis usage and performance
- Specific gait/movement situations
- Activities of Daily Living (ADLs)
- Body image
- Work/life limitations
- Preference and satisfaction
- Gait lab assessments (biomechanics and metabolic energy consumption)

Gait analysis

- Knee flexion control: More consistent with Genium X4 during level walking with varying gait velocities.
- Walking up ramps: More natural movement pattern of the prosthetic leg and reduced ankle power on the contralateral side.
- Starting to walk: Could be performed with a more natural movement pattern of the prosthetic leg and reduced compensatory movements of the pelvis and upper body.
- Walking backwards: Higher anterior-posterior ground reaction force due to limited knee flexion, indicating an improved acceleration phase.

User feedback outcomes

After an average of 14 weeks using Genium X4:



All users (n=8) preferred Genium X4 over Genium/Genium X3.

50% of users (n=4) reported that Genium X4 required less exertion while walking than their everyday prosthesis; 50% reported no difference.

A majority of users reported that Genium X4 was superior to Genium/Genium X3 when walking up ramps (n=5), starting to walk (n=7), walking backwards (n=6), and cycling (n=4/5).

50% (n=4) found Genium X4 superior for walking up stairs and down ramps; all users reported Genium X4 to be equivalent or better to Genium/Genium X3 for these tasks.

A majority of users (n=5) reported either equivalent or greater walking comfort compared with Genium/Genium X3.

Users reported clinically relevant improvement in many ADLs, including multiple mobility-related activities (e.g., walking in a crowded environment, pulling open a heavy door, stepping over minor obstacles, walking up ramps, walking up stairs, stepping backwards, walking at varying speeds, riding a bicycle, moving around in small spaces)