MYNERVA

Master Thesis

Can the wearable sensory prosthesis *Leia* improve gait and balance in peripheral neuropathy patients?

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Duration: 6 months – 1 year

Start: Immediately

Description: Peripheral neuropathy (PN) causes numbness, impaired sensory feedback, gait and balance deficits, increasing fall risk and reducing quality of life. No treatment is currently available for the broad PN patient population; care is limited to symptom management rather than restoration of function.[1] The *Leia* sensory prosthesis (MYNERVA AG) is a non-invasive, textile-integrated wearable device that delivers targeted electrical stimulation to the foot eliciting somatotopy perception and improving gait and balance in individuals with PN.[2]

This ongoing randomized, sham-controlled, double-blinded, multicenter study (n≈80) is primarily evaluating gait and balance improvement after eight weeks of Leia stimulation (four weeks supervised, followed by four weeks of home use), compared with a sham device. Secondary outcomes include neuropathic pain (NPSI), quality of life (NORFOLK QOL-DN/EQ-5D), sensory function (monofilament, tuning fork, Sudoscan), and magnetic resonance imaging (MRI).

Findings will provide the first longitudinal clinical evidence on safety, feasibility, and clinical benefit of the *Leia* device.

Training: As part of this study, you will learn to coordinate and perform gait and balance assessments (e.g. functional gait assessment, 10 m walking test, timed up and go). In the movement lab, you will gain hands-on experience with quantitative gait measurement using marker-based motion capture and force plates. Sensory function will also be assessed using monofilament, tuning fork, and Sudoscan. Beyond data collection, you will help schedule and coordinate assessments across the supervised and home-use phases, and will be actively involved in data acquisition, analysis, and discussion of findings. Gait data processing will involve Vicon motion capture systems and Python-based analysis pipelines.

References:

1. Mauermann, M. L. & Staff, N. P. Peripheral Neuropathy: A Review. *JAMA* **335**, 255–266 (2026).
2. Gozzi, N. *et al.* Wearable non-invasive neuroprosthesis for targeted sensory restoration in neuropathy. *Nat. Commun.* **15**, 10840 (2024).