ABSTRACT OF BACHELOR THESIS

Title: The Use of Peroneal Nerve Functional Electrical Stimulation in Patients with Spastic Paresis

Subtitle: Clinical Assessment of Novel Device for Functional Electrical Stimulation

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Background: Peroneal Nerve Functional Electrical Stimulation is a method used to compensate foot drop syndrome, which can be often seen in patients with spastic paresis. Foot drop syndrome limits lower extremity function, impairs mobility and represents a considerable risk of falling. Due to the frequent occurrence of these difficulties and their severity new compensation and therapeutic devices are being developed.

Objective: The main purpose of the thesis was to use novel device for functional electrical stimulation (FES) in patients with spastic paresis and describe its functionality, reliability, ergonomics and user-friendliness from the perspective of both therapist and patient.

Methods: Two probands, diagnosed with spastic paresis, participated in a two-week trial of the prototype device which offers new options of multi-channel stimulation and setting of all stimulation parameters directly in the device using the touch screen. After the intervention a semi-structured interview and a survey, which were focused on the device abilities, were administered with probands. The interview and the survey were then supplemented by the therapist's conclusions. The effect of the device on gait could be observed by comparing the results of the initial and exit assessment, which consisted mainly of gait (10MWT) and spasticity assessment (FSCA).

Results: The conclusions of the therapist and the patients agreed on the main topics. The device as a whole can be evaluated positively. The device is easy to control and its immediate orthotic effect on gait can be confirmed subjectively by gait analysis and objectively by comparison of 10 MWT results. During the testing, several different software and hardware flaws were revealed, which limit the use of devices in both clinical and home environments.

Conclusions: The device is functional, reliable and is easy to use in both clinical and home environments. The positive orthotic effect of the device on gait can be proved by the assessment results. Occurring bugs limit the use of the device, but their elimination should be undemanding.

Key words: functional electrical stimulation – spastic paresis – stroke – multiple sclerosis – craniocerebral trauma – foot drop syndrome