Exploring Error-Minimization Protocols for Upper-Limb Function During Activities of Daily Life in Chronic Stroke Patients

Authors: M. A. Riurean, S. Heijnen, C. A. Knott, J. Makinde, D. Gotti, J. VD. Kamp

Abstract: Objectives: The current study is done in preparation for a randomized controlled study investigating the effects of an implicit motor learning protocol implemented using an extension-supporting glove. It will explore different protocols to find out which is preferred when studying motor learn-ing in the chronic stroke population that struggles with hand spasticity. Design: This exploratory study will follow 24 individuals who have a chronic stroke (> 6 months) during their usual care journey. We will record the results of two 9-Hole Peg Tests (9HPT) done during their therapy ses-sions with a physiotherapist or in their home before and after 4 weeks of them wearing an exten-sion-supporting glove used to employ the to-be-studied protocols. The participants will wear the glove 3 times/week for one hour while performing their activities of daily living and record the times they wore it in a diary. Their experience will be monitored through telecommunication once every week. Subjects: Individuals that have had a stroke at least 6 months prior to participation, hand spasticity measured on the modified Ashworth Scale of maximum 3, and finger flexion motor control measured on the Motricity Index of at least 19/33. Exclusion criteria: extreme hemi-neglect. Methods: The participants will be randomly divided into 3 groups: one group using the glove in a pre-set way of decreasing support (implicit motor learning), one group using the glove in a self-controlled way of decreasing support (autonomous motor learning), and the third using the glove with constant support (as control). Before and after the 4week period, there will be an intake session and a post-assessment session. Analysis: We will compare the results of the two 9HPTs to check whether the protocols were effective. Furthermore, we will compare the results between the three groups to find the preferred one. A qualitative analysis will be run of the experience of participants throughout the 4-week period. Expected results: We expect that the group using the implicit learning protocol will show superior results.

Keywords: implicit learning, hand spasticity, stroke, error minimization, motor task

Conference Title: ICPMR 2024: International Conference on Physical Medicine and Rehabilitation

Conference Location : Vienna, Austria **Conference Dates :** July 29-30, 2024