

Feasibility of a study design for Parkinson's disease

One of the current research projects at the IMC University of Applied Sciences Krems is the Parkinson Freezing of Gait Study in the Department of Health Sciences, which is testing a study design for feasibility and acceptance among Parkinson patients. A team of researchers from the Department of Health Sciences in the Physiotherapy programme is responsible for this project.

It is a study with a cross-over design with people suffering from idiopathic Parkinson's syndrome. Two innovative devices are used: STAPPONE Research Insoles and the CUE1 medical device from Charco Neurotech.

A sensitive sole

As part of the study by Agnes Wilhelm, MSc, Christian Paumann, MSPhT, Jessica Janssen PhD, MSc, BH and Tanja Riedl, MHPE on idiopathic Parkinson's syndrome, patients undergo two tests: a 10-metre walk test and the "Freezing of Gait Score". "Freezing of Gait" describes a distressing Parkinson's symptom that is often associated with tumbling. During the tests, the patients wear STAPPONE sensor soles, which record parameters such as step length, cadence (step frequency), double stance phase (double-sided leg load) or the duration of the gait cycle. The intelligent STAPPONE sensor sole is simply inserted into a comfortable shoe and measures the foot pressure load of its wearer as well as other gait parameters. The accompanying software enables visual real-time biofeedback and objective data on other relevant movement parameters.

"The STAPPONE Research Insoles enable us in our setting to simply record a gait analysis and the parameters without needing our own gait lab," says Agnes Wilhelm, MSc, professor at IMC Krems. This gives the research team more flexibility in terms of premises and conducting the tests. In the Freezing of Gait Score, test subjects have to get up from a chair, walk one metre, turn 360 degrees clockwise, then counterclockwise and finally walk through a door. "Recording these parameters in a classic gait lab would only be possible with significantly more effort," says Wilhelm. All test persons also found the soles pleasant and comfortable – an important point for the statement regarding the acceptance and feasibility of the study design.

Vibrations against Parkinson's

The study also uses the CUE1 device from the company Charco Neurotech. The medical device is supposed to improve Parkinson's symptoms and thus mobility with the help of vibrating impulses. It is once switched off and once switched on during the study, while the shoe insoles measure the movement parameters. A questionnaire subsequently determines the acceptance of and satisfaction with the devices used and the study design. "Our goal is to use this information to set up a later, larger study examining the effectiveness of the CUE1 device," says Agnes Wilhelm.

Objective data are the be-all and end-all of research. "Gait parameters such as step length, cadence and double stance phase are parameters that we would otherwise not be able to record, but which can provide important clues, especially with regard to freezing of gait, to identify when freezing of gait occurs and what changes in relation to it when the CUE1 device is used," Wilhelm concludes.