Third congress on NeuroRehabilitation and Neural Repair

Programme and Proceedings Book

From Science to Evidence-based Practice

22-23-24 May 2019 | The Netherlands

DSNR
Dutch Society of Neuro-Rehabilitation

BSNR
Belgian Society for Neurorehabilitation

Deutsche Gesellschaft für Neurotraumatologie und klinische Neuro-rehabilitation e.V. DGNKN

acpin
Connecting knowledge and practice

Topic 4: Functional diagnostics/prognostics

2

A novel setup and protocol to measure the range of motion of the wrist and the hand

K. Nizamis[1], N. Rijken[2], A. Mendes[2], M. Janssen[2], A. Bergsma[2], B. Koopman[2]

[1]Biomechanical Engineering, University Of Twente, Enschede, Netherlands

Introduction: The human hand is important for the performance of activities of daily living which are directly related to quality of life. Various conditions, such as Duchenne muscular dystrophy (DMD) can affect the function of the human hand and wrist. The ability to assess the impairment in the hand and the wrist by measuring the range of motion (ROM), is essential for the development of effective rehabilitation protocols.
Main objective: In this study we explore the feasibility and reliability of the Leap motion sensor in measuring active hand/wrist ROM.
Methods: We measured the hand/wrist ROM of 20 healthy adults with the goniometer and the Leap motion sensor, in order to assess the agreement between tem and additionally, we performed a test-retest of the Leap motion sensor with 12 of them, to assess its reliability.
Results and discussion: The results suggest a low agreement between the goniometer and the leap motion sensor, yet showing a large decrease in measurement time and high reliability when using the later. Future research should focus on improving data acquisition and quality and evaluate the Leap motion sensor for submaximal angles.
Conclusion: Despite the low agreement between the two Methods, we believe that the Leap motion sensor shows potential to contribute to the development of hand rehabilitation protocols and be used in a clinical setting.
Acknowledgements: This work was initiated by the Flextension Foundation and it was financially supported by the Netherlands Organisation for Scientific Research (NWO), the Duchenne Parent Project, Hankamp Rehab, Spieren voor Spieren, TMSi, Festo and Pontes Medical. Project Number: 13525.