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## Quantification of tremor and rigidity during deep brain stimulation surgery for Parkinson's disease

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**Objective:** The aim of this study is to validate practical and objective measures to assess changes in rigidity and tremor due to micro-lesion effects and test stimulation during deep brain stimulation (DBS) surgery.

**Background:** Several factors contribute to accuracy and success of electrode placement during DBS surgery for Parkinson's disease. Intra-operative test stimulations and subsequent evaluation of beneficial as well as potential adverse effects are the final and perhaps most important step in placement accuracy. However, these subjective clinical evaluations rely on clinical experience and expertise and are accompanied by both inter- and intra-rater variability. Objective quantification of baseline symptomatology, as well as subtle symptom changes, can standardize assessment, minimize variability and further improve surgical accuracy and more importantly clinical outcomes.

**Methods:** Appropriate tremor or rigidity measurements (accelerometer and passive resistance) were taken at three time points with and without dual task, 1) before insertion of the electrode 2) directly following insertion prior to test stimulation and 3) during test stimulation at target level.

**Results:** Data has been collected from one patient so far and preliminary analysis shows an immediate and significant reduction in rest tremor upon electrode placement and subsequent test stimulation. Data collection is currently ongoing and our aim is to finalize data collection for tremor and rigidity changes from at least 10 consented patients by early February. This will allow a complete and detailed report of analysis and results at time of presentation.

**Conclusions:** The preliminary data looks promising and the practicality of objective tremor measures is unambiguous. Together with newly collected data report will allow for clear conclusions regarding the validity, applicability and standardization of tremor and rigidity measures during DBS surgery.

### Biography

He has worked as an Educational Advisor for the Netherlands School of Public and Occupational Health tasked with the development of professional training programs for health care professionals to improve their clinical and scientific effectiveness. He has completed a PhD in Neuroscience at the UQ School for Health and Rehabilitation Sciences in 2013 where he investigated the effects of acute pain on postural motor control. He is now employed as a Post-doctoral Research Fellow for the Asia-Pacific Centre for Neuromodulation and the Centre for Sensorimotor Performance investigating the direct and long-term effects of deep brain stimulation on motor and non-motor symptoms of patients with neurological disorders

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