Cleveland Clinic Innovations

Wireless Accelerometer Sleeve for MRI guided Focused Ultrasound

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PRODUCT

Intra- and post operative wireless monitoring of tremor in MRIgFUS procedures.

INDICATION

HIFU, Tremor, Parkinson's Disease, Monitoring, MRI safe

VALUE PROPOSITION

- Ascertains the joint or joints contributing to tremor.
- Provides quantitative information while being less cumbersome as compared to the wired version.
- Enables clinicians to better treat tremor and Parkinson's disease patients.
- Supports long-term monitoring of patients with tremor.

DEVELOPMENT STAGE

- Technology demonstrated.
- Objective tremor measurement parameters established.

INTELLECTUAL PROPERTY

Patent application pending

RELATED PUBLICATION

Front Neurol. 2022; 13: 880814.
Oper Neurosurg. 2023;1; 24(6):641-650

PARTNERING OPPORTUNITY

Development and commercialization

CONTACT INFORMATION

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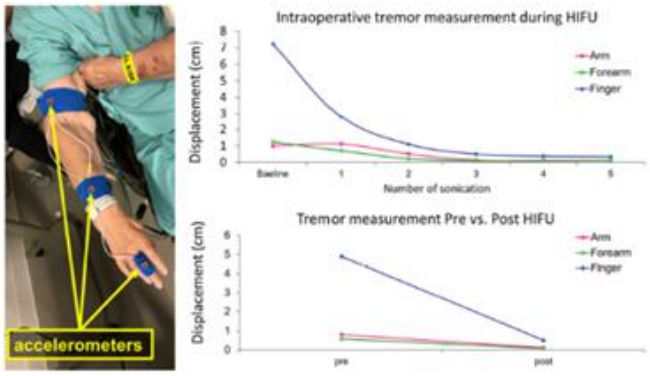
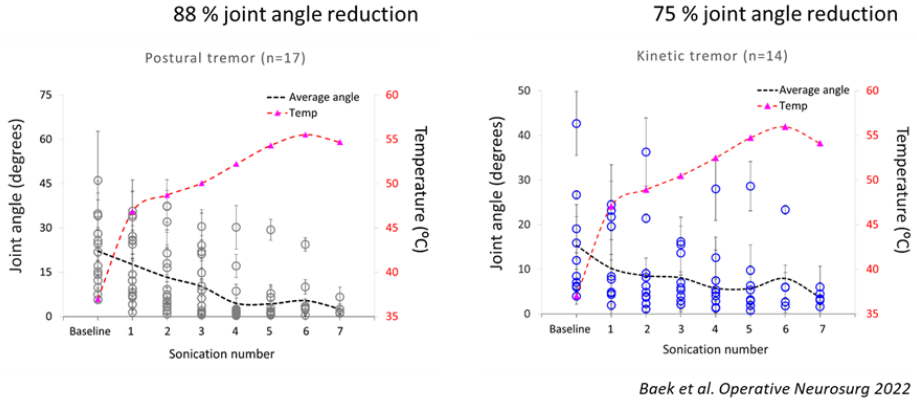
UNMET NEED

MRI guided focused ultrasound (MRIgFUS) is an FDA approved treatment for essential tremor and tremor related to Parkinson's Disease. However, subjective clinical evaluation is the standard method for assessing tremor response to treatment by MRIgFUS and existing wearables are not MRI safe. This frequently leads to incomplete tremor control, non-durable improvement, or undesirable side effects. In addition, current paradigm does not provide objective measurement of treatment durability (long term follow-up of patients). Thus, there is an unmet need for an MRI compatible, objective monitoring of tremor in patients intra- and post- procedure.

SOLUTION

Researchers at The Cleveland Clinic have developed an objective approach that incorporates wired accelerometers attached at three positions on the arm together with a software package. A form-fitting sleeve outfitted with multiple sensors/ accelerometers positioned over the upper extremity at 3 or more joints monitors tremor. These accelerometers transmit data to a computer housed in the console room/or integrated with HIFU console. The data include measurements of amplitude, frequency, and angle at each joint. This is analyzed in real time to monitor the response to treatment and real time adjustments to treatment. These disposable sleeves could provide and standardized long-term patient monitoring.





Baek et al. Operative Neurosurg 2022