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Wrist Assessment and Rehabilitation System (20150015, Dr. Juergen Konczak)

Technology No. 20150015

IP Status: Issued US Patent; **Application #:** 15/073,262

Robotic Rehabilitation and Assessment for Wrist

A new robotic system for wrist joint proprioception provides both assessment of function and rehabilitation training all in the same device. The device not only measures a user's ability to sense wrist position and detect various degrees of movement, but also provides discrete and continuous motion rehabilitation training exercises that can be tailored to each user's ability. The software provides users with visual, tactile and haptic feedback and provides clinicians with an objective assessment of the subject's wrist proprioception ability and rehabilitation progress.

Wrist Movement

The handle of the device operates along the three degrees of freedom of movement of the wrist: flexion-extension, abduction-adduction and pronation-supination. In the assessment mode, the device delivers forces to the wrist along these axes and assesses the user's ability to sense these forces, while in training mode users can move the unit themselves along the same three axes to perform various tasks.

Provides Proprioceptive Status

The technology was found to reliably measure wrist joint acuity in order to accurately assess proprioceptive status and level of function/dysfunction, and the device is expected to deliver similar encouraging results in improving efficiency and efficacy of rehabilitation. Therapists can remotely access the device's software to see results and program the therapy, allowing patients to use the device at home to reduce the cost and time associated with multiple in-person office visits.

BENEFITS AND FEATURES OF THE WRIST ASSESSMENT AND REHABILITATION SYSTEM:

- Provides assessment and rehabilitation in one device

- Therapists obtain proprioceptive status and can tailor training exercises
- Can be used remotely to reduce the costs and time associated with in-person office visits

Phase of Development - Prototype dev

Researchers

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Publications

Robot-aided assessment of wrist proprioception
Frontiers in Human Neuroscience, 14 April 2015