

The Laboratory for Translational Neurorecovery

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Mission

The mission of the Laboratory for Translational Neurorecovery (LTNr) is to transform stroke rehabilitation by advancing our understanding of brain mechanisms that enable post-stroke recovery. We focus primarily on improving arm and hand movement for patients after stroke.

Research

LTNr has a number of active clinical-research studies across the continuum of care for patients with stroke. Our largest, The Stroke Motor Rehabilitation and Recovery sStudy (SMaHRT), examines the natural history of arm and hand motor recovery. Findings from this study have contributed to over 10 published research articles in top-tier medical journals in the past 5 years. Other ongoing studies in the lab include a telerehabilitation study and a study investigating the contribution of motor pathways in the brain to arm and hand function. LTNr has been highly successful in applying for national funding and building collaborations. We have been awarded over 6 Grants in the past 3 years from federal (National Institutes of Health, Veterans Health Administration), private, industry, and philanthropic sources.

Neurotechnologies

Various cutting-edge neurotechnologies are used to support LTNr's research questions. Structural MRI is used to understand the role of stroke size and location on arm and hand motor recovery. Non-invasive brain stimulation assesses the integrity of descending motor pathways in the brain that allow for arm and hand movement.

EEG helps us to understand the role of cortical oscillations in stroke recovery. Functional Near-Infrared Spectroscopy (fNIRS) is used to decipher the role of cortical activity in real-time during upper extremity movement. An FDA-approved arm orthosis robot system captures kinematics of movement patterns after acute stroke.

Clinical Translation

We are integrated with the MGH Neurorecovery Clinic, an interdisciplinary clinic in which experts from Neurology, Occupational, Physical, and Speech Therapy, Neurosurgery, Nutrition Services, and Pharmacy collaborate to assess patients and provide comprehensive recommendations to maximize recovery. We are deeply committed to increasing accessibility to new therapies, technologies, and clinical-research opportunities to maximize recovery for our patients.