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Neuromodulation for chronic stroke: Solving of technical challenges and identification of key biomarkers

Over 6.5 million people in the US suffer from chronic stroke, yet our understanding of the neuroscience underlying stroke recovery is lacking and few treatments exist beyond physical therapy. One promising technique uses brain stimulation paradigms to activate the motor system while gaining biosignal feedback respective to each individual patient's stroke deficits. Many have suggested that this experimental design could lead to clinical acceptance of brain stimulation as a supplemental therapy for chronic stroke. Major technical challenges to solving this problem include filtering of EEG and MRI artifacts during the period of stimulation. In this presentation, we will discuss several therapeutic approaches to treating chronic stroke. Commercially available devices versus those in the development stage will also be reviewed. We propose a novel concept for neuromodulation for chronic stroke in line with identification of key biomarkers that may someday lead to successful recovery.

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Nathan C. Rowland, MD, PhD, FAANS is a neurosurgeon at the Medical University of South Carolina, where he holds the position of Associate Professor in the departments of Neurosurgery, Neurology and Health Sciences Research. His other roles include Executive Director of the MUSC Institute for Neuroscience Discovery, Associate Director of the Neurosurgical Residency Program, and Co-Surgical Director of both the MUSC Movement Disorders Program and the MUSC Gamma Knife Program. In addition to these roles, Dr. Rowland serves as Chair of the American Society of Stereotactic and Functional Neurosurgeons' Diversity, Equity, and Inclusion Committee and provides consulting expertise for domestic and international industry partners.

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