Investigating Transcranial Direct Current Stimulation in Post-Stroke Motor Recovery: Advance Study from Phase I to Phase II

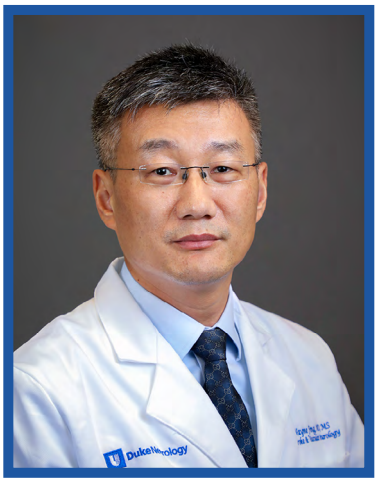
January 24

Tuesday, 12:30 pm

Billings Building—Rosedale Room and Zoom

For Researchers

SPEAKER:



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Hosts: Kathleen Friel, Ph.D.
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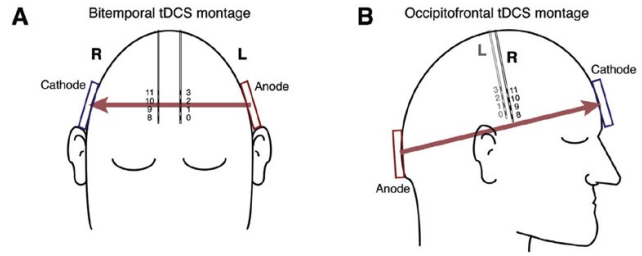
Abstract

Transcranial Direct Current Stimulation (tDCS) is a non-invasive format of neuro-modulation tool that can modulate cortical excitability and induce clinical changes in stroke patients with motor impairment. The optimal dose of tDCS is unknown and has been investigated. A meta-analysis suggests there is a dose-response relationship between current density and motor impairment reduction in stroke patients which high dose may leads to better efficacy. It was further proved that high dose correlates with strong electrical field strength in human brain in vivo. A phase I safety and tolerability study demonstrates that it is safe and tolerable to escalate dose/current to 4mA in stroke patient. A 12-center phase II dose selection clinical trial titled "TRANScranial direct current stimulation for POst-stroke motor Recovery—a phase II sTudy (TRANSPORT2)" is ongoing on the NIH funded stroke trial network. This study aims to investigate the preliminary efficacy and safety and feasibility of tDCS, along with modified constraint-induced movement therapy, in first-ever ischemic stroke patients. Three dose groups will be tested including sham stimulation, low dose (2mA) and high dose (4mA) with 129 subjects. This study also investigates whether assessing the integrity of corticospinal tract by an imaging method (i.e. weighted corticospinal tract lesion load) or a neurophysiology method (i.e. presence of motor evoked potential by transcranial magnetic stimulation) can predict the therapeutic response to tDCS.

Schematics:



Publications:

1. Wuwei Feng, Steve Kautz, Mark George, Caitlyn Ellerbe, Gottfried Schlaug, Pratik Chhatbar. *Transcranial Direct Current Stimulation for Stroke Motor Recovery: Challenges and Opportunity.* PMR. 2018 Sep;10 (9S2):S157-S164. PMID: 30269802.

2. Pratik Chhatbar, Steve Kautz, Marc George, Hernan Bayona, Shimeng Liu, Wuwei Feng. *Safety and tolerability of transcranial direct current stimulation to stroke patients - A phase I current escalation study.* American Society of Neurorehabilitation Annual Conference 2017. Nov 8-11. Baltimore.

3. Pratik Y Chhatbar, Steven A Kautz, Istvan Takacs, Nathan C Rowland, Gonzalo J Revuelta, Mark S George, Marom Bikson, Wuwei Feng. *Evidence of transcranial direct current stimulation-generated electric fields at subthalamic level in human brain in vivo Affiliations expand.* PMID: 29576498, PMCID: PMC6019625, DOI: 10.1016/j.brs.2018.03.006.