Seminar

CENTER FOR ADAPTIVE NEURAL SYSTEMS

IRA A. FULTON SCHOOL OF ENGINEERING

Neurobiological Approaches to Motor Recovery & Rehabilitation After Stroke and Cerebral Palsy

George Wittenberg, MD, PhD

Abstract: After an acute stroke, brain activation during motor tasks decreases during the course of recovery and transcranial magnetic stimulation (TMS) motor map area may increase, a seemingly paradoxical result. In cerebral palsy, motor maps may be deleted, duplicated, or shifted. In acute stroke patients, motor representations evolve over time, with enlargement of motor maps, as measured by TMS. After therapy in subacute stroke patients, particular brain areas have changes in activation with motor task performance and TMS map area increase. Patients with cerebral palsy have had lateral shifts of leg representation, particularly when they had more lower extremity involvement in their condition. Conclusions: 1. Dynamic changes over the weeks after stroke enable motor recovery using spared elements of motor cortex, 2. Intense therapy during the subacute period results in increased activation in contralesional PMA and preserved ipsilesional M1 activation and that these changes may underlie some therapy-induced improvements in gross motor function. 3. Motor map measurement may help in diagnosis and prognosis in cerebral palsy (Support: NIH R01 HD040984 & R21HD49019)

Dr. Wittenberg is currently Staff Physician at the Geriatrics Research, Education, and Clinical Center at the VA Maryland, and Assistant Professor of Neurology at University of Maryland. He is Director of the Laboratory for Research on Arm Function and Therapy, and Associate Director of the Maryland Exercise and Robotics Center of Excellence at the Baltimore VA. He obtained his doctoral degree in Biology and completed medical school at the University of California, San Diego. He then had further clinical and research training at Washington University, St. Louis and the National Institutes of Health (NIH).

Location and Time:
Biodesign Auditorium, ASU
June 25, 2007
11:00am - 12:00 pm

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