

Volume 4
Issue 1

Summer 2017

Recovers

STROKE RECOVERY RESEARCH CENTER

A Center of Biomedical Research Excellence (COBRE) in Stroke Recovery at the Medical University of South Carolina



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FROM THE DIRECTOR

COBRE investigators have been hard at work this summer on the application for COBRE Phase II that will be submitted at the end of September. I am very excited by the group of new junior investigators that we have assembled. We will likely be featuring them in the next newsletter. The renewal is coming along well and we have high hopes for an outstanding submission and a second five years of support.

This issue of the newsletter highlights several exciting milestones that I want to be sure everybody recognizes. First and foremost, Junior Investigator Andy Shih recently received his first R01 (“Deciphering the Cerebral Microinfarct and its Role in Vascular Cognitive Impairment”) and will be graduating to independent investigator status at the end of this grant year! He joins fellow junior investigator Colleen Hanlon who is also graduating this year after having received R01 and R21 support. We couldn’t be more proud of them! Second, our productive relationship with the Delaware CTR (which is another IDeA program) continues to grow. The CTR was the primary sponsors of the “Stroke Recovery Research from Translational Science to the Community Perspective” workshop featured on Page 6. It was attended by 53 investigators, mostly from our COBRE group, but also from the University of Delaware. There were a number of interesting talks and great potential for collaboration between the two IDeA states. Third, Junior Investigator Wayne Feng, and COBRE pilot investigator Pratik Chhatbar, have published what will surely be a highly cited article in Brain Stimulation. They found that tDCS currents up to 4 mA were safe for stroke patients, effectively doubling the safe range. Given that there is some evidence of a dose dependent response to tDCS, increasing the possible dose may prove key to increasing the efficacy of tDCS interventions. It is also exciting that this publication included authors for all of our cores. Multidisciplinary research at its finest!

COBRE investigators continue to be amazingly productive. For Grant Year 3 (ended 3/31/17) the total funding for stroke recovery research by MUSC researchers was \$9.4 million, up from \$2.1 million in annual funding at the time of the COBRE award. We are so thankful to the IDeA program for funding our COBRE and look forward to many more years of productive research and infrastructure building.

Steve Kautz
Director, COBRE in Stroke Recovery

The Medical University of South Carolina was awarded a major grant from the National Institutes of Health (NIH) to support the development of a Center for Biomedical Research Excellence (COBRE). This award (P20GM109040) is part of the Institutional Development Award (IDeA) program administered by the National Institute of General Medical Sciences (NIGMS).

Visit: <http://www.nigms.nih.gov/Research/CRCB/IDeA/Pages/default.aspx> to learn more about the IDeA program.

MULTIMODAL TMS SPEAKER SERIES

The NIH is hosting the Multimodal TMS Speaker Series to bring together the leaders in the field conducting research using non-invasive brain stimulation and functional imaging including EEG and fMRI.

Upcoming Speakers & Dates (click names to go to event pages):

[John Rothwell](#), October 2, 10:30 am

[Andrea Antal](#), October 10, 11 am

[Hartwig Siebner](#), October 19, 10:30 am

[Felix Duecker](#), October 19, 11:30 am

[Risto Ilmoniemi](#), November 15, 1 pm

[Joel Voss](#), November 15, 2 pm



Colleen Hanlon, PhD, was featured on May 31st, 2:30 pm.
The event was broadcast via web-ex and archived for later viewing.
Event page [link](#) — For [more information](#) on Dr. Hanlon.

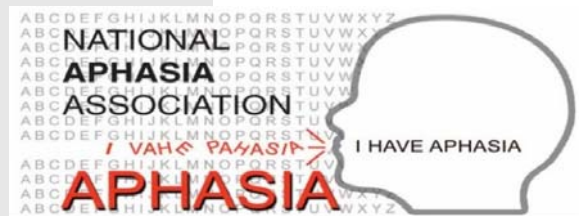
APHASIA AWARENESS MONTH

June was National Aphasia Awareness month. During this month a light is cast on the challenging, isolating, and often misunderstood condition that affects about two million people in the United States. Aphasia affects a person's ability to use and understand language. Aphasia does not affect a person's intellect.

[Learn more.](#)



**National
Aphasia
Association**



PUBLICATION HIGHLIGHT

Chhatbar PY, Chen R, Deardorff R, Dellenbach B, Kautz SA, George MS, Feng W (2017).

Safety and tolerability of transcranial direct current stimulation to stroke patients - A phase I current escalation study.

Brain Stimul. 2017 May - Jun;10(3):553-559.

Abstract

BACKGROUND AND OBJECTIVE:

A prior meta-analysis revealed that higher doses of transcranial direct current stimulation (tDCS) have a better post-stroke upper-extremity motor recovery. While this finding suggests that currents greater than the typically used 2 mA may be more efficacious, the safety and tolerability of higher currents have not been assessed in stroke patients. We aim to assess the safety and tolerability of single session of up to 4 mA in stroke patients.

METHODS:

We adapted a traditional 3 + 3 study design with a current escalation schedule of 1»2»2.5»3»3.5»4 mA for this tDCS safety study. We administered one 30-min session of bihemispheric montage tDCS and simultaneous customary occupational therapy to patients with first-ever ischemic stroke. We assessed safety with pre-defined stopping rules and investigated tolerability through a questionnaire. Additionally, we monitored body resistance and skin temperature in real-time at the electrode contact site.

RESULTS:

Eighteen patients completed the study. The current was escalated to 4 mA without meeting the pre-defined stopping rules or causing any major safety concern. 50% of patients experienced transient skin redness without injury. No rise in temperature (range 26°C-35 °C) was noted and skin barrier function remained intact (i.e. body resistance >1 kΩ).

CONCLUSION:

Our phase I safety study supports that single session of bihemispheric tDCS with current up to 4 mA is safe and tolerable in stroke patients. A phase II study to further test the safety and preliminary efficacy with multi-session tDCS at 4 mA (as compared with lower current and sham stimulation) is a logical next step. ClinicalTrials.gov Identifier: [NCT02763826](https://clinicaltrials.gov/ct2/show/study/NCT02763826).

KEYWORDS:

3+3 design; Dose escalation; High-dose; Non-invasive brain stimulation; Stroke recovery; Transcranial direct current stimulation

Stroke Recovery Research from Translational Science to the Community Perspective

On Tuesday, May 9th, 2017, faculty from the Medical University of South Carolina and the University of Delaware presented a one day Conference exploring stroke recovery research. The event was sponsored by the Delaware CTR, and MUSC's COBRE in Stroke Recovery and Wide Spectrum Investigation of Stroke Outcome Disparities (WISSDOM), and held at the Francis Marion Hotel in Charleston. Presentations addressed translational science; clinical science; community interventions; and a community perspective on research. 53 participants attended the event, including faculty, post-doctoral fellows and graduate students from the participating institutions.



Presenter: Dr. Steve Kautz



Stroke Recovery Retreat Itinerary

Presenter	Institution	Title
Dr. Robert Adams	MUSC	Stroke Recovery Research
Dr. Steve Kautz	MUSC	COBRE and NM4R Resources
Dr. John Slater	University of Delaware	Biometric Microfluidic Networks in Hydrogels
Dr. Catrina Robinson	MUSC	Insulin to Enhance Neuroplasticity
Ali Alawieh	MUSC	Complement System to Enhance Recovery
Dr. Susan Morton	University of Delaware	Anodal Transcranial Direct Current Stimulation Enhances Retention of Locomotor Learning in Stroke
Dr. Jared Medina	University of Delaware	Sensory Deficits and the Impact on Motor Recovery
Dr. Fabrizio Sergi	University of Delaware	Use of MR-compatible Haptics to Study the Neural Correlates of Robot-aided Neuromodulation
Dr. Mark Bowden	MUSC	SCOPE: Testing and Intervention Delivered by Therapists in the Rehab Hospital
Dr. Wayne Feng	MUSC	Safety and Tolerability to Improve Recovery
Dr. Na Jin Seo	MUSC	Enhancing Sensation to Improve Recovery
Dr. Gayenell Magwood	MUSC	Nurse Based Intervention Targeting Disparities in the Community
Dr. Michelle Woodbury	MUSC	Lessons Learned from PCORI Group
Dr. Carolyn Jenkins	MUSC	Lessons Learned from CBR
Dr. Michelle Nichols	MUSC	Lessons Learned from Stroke Recovery Studies

Stroke Caregiver's Summit

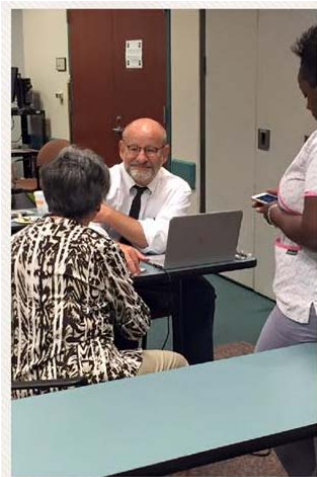
Saturday, June 17th marked the 1st Annual Stroke Caregiver's Summit, hosted by Roper St. Francis and the COBRE in Stroke Recovery. 34 participants joined the full-day's event. Those in attendance included stroke survivors and the children, siblings, spouses, and parents of survivors. 11 speakers addressed a variety of topics, including medical care, support groups, research opportunities, advocacy, and respite care. Barbara Lutz, PhD, RN from UNC, Wilmington, NC, provided the keynote address: "Dealing with the shock and crisis of the stroke event, discharge, and new life responsibilities."

Additionally, the following organizations participated in the event:

MUSC COBRE for Stroke Recovery
MUH
Roper Rehabilitation Hospital
Healthsouth Rehabilitation Hospital
Floyd Brace
Adaptive Expeditions
The MUSC Center for Aging
MUSC CARES clinic
The WISSDOM study
The PCORI Tier II-funded Survive to Thrive: Living Well with Stroke group.

"This couldn't have come at a better time. Our morale as a family is dipping. It's time to pull it back up."

-Summit Participant



Left top: Dr. Robert Adams, and Left bottom: Dr. DeAnna Adkins speak with participants during the event.



Below: Presentation during the 2017 Caregiver's Summit.



Upcoming Meetings

Thursday, August 10th | COBRE Executive Committee/Junior Investigator Meeting
Thursday, September 14th | COBRE Executive Committee/Junior Investigator Meeting
Thursday, October 12th | COBRE Executive Committee/Junior Investigator Meeting

Contact Amy Ellis, ellis@musc.edu, for more information

Workshops

October 15-20 | National Center of Neuromodulation for Rehabilitation

[Level I Workshops](#)

Level one workshops introduce a range of concepts of NM4R (brain stimulation and operant conditioning) and give skills in basic TMS and operant conditioning neurophysiology.

Resources

Multimodal TMS Speaker Series

[Event Page](#)

Bringing together the leaders in the field conducting research using non-invasive brain stimulation and functional imaging including EEG and fMRI.

Society for Neuroscience | Series of Educational Tools

[View the Series](#)

Promoting Awareness and Knowledge to Enhance Scientific Rigor in Neuroscience

NEW TEAM MEMBER

Administrative Assistant
Amy Ellis



As the newest member in the Administrative Core, Amy provides administrative support for Dr. Kautz and the administrative team for activities related to the management of the COBRE. She handles scheduling, coordination and follow-up for all meetings. Additionally, Ms. Ellis serves as the first contact in organizing COBRE activities including meetings, lab tours, and visiting scholars.

Welcome to the team, Amy!

NEW TEAM MEMBER

Research Assistant/Outreach Coordinator
Alyssa Hydar



Alyssa, is a licensed physical therapist assistant. She has recently joined the Stroke Recovery Research Center's team after working as a treating clinician at a long term acute care hospital in Mt. Pleasant for the last four years. She is also a graduate of the College of Charleston with a degree in public health. She is very motivated to learn more about rehabilitation research while using her public health degree to focus on increasing the visibility of rehabilitation research opportunities to physicians, therapists, case managers, and stroke survivors in the low country area.

Welcome to the team, Alyssa!

COBRE Funded Grants

Principal Investigator	Title
Bonilha, Heather	Role of Insular Cortex in Swallowing Impairment & Recovery after Stroke
Bowden, Mark	Excitatory and Inhibitory rTMS as Mechanistic Contributors to Walking Recovery
Feng, Wayne	Optimizing Transcranial Direct Current Stimulation Current and Electrode Montage for Stroke Patients
Gregory, Chris	Treating Depression and Enhancing Locomotor Recovery Post-stroke
Hanlon, Colleen	Investigating the Neurobiologic Basis for Loss of Cortical Laterality in Chronic Stroke Patients
Riegel, Arthur	Behavior and Neuronal Function following a Single vs Multiple Sessions of rTMS in a Rat Chronic Stroke Model
Robinson, Catrina	The Role of Obesity on Stroke Recovery in a Mouse Model of Ischemic Stroke
Shih, Andy	Microvascular Function and Neuroplasticity after Stroke

COBRE Affiliated – Active Grants

Principal Investigator	Title	Funding Agency	Project Dates	Total Funding
Adams, Robert	Strategically Focused Disparities in Cardiovascular Disease Research Network	AHA	06/01/15-05/31/19	\$3,709,200
Adkins, DeAnna	Enhanced Mitochondrial Function to Increase Effectiveness of Post-stroke Rehabilitation	VA/RRD	01/01/17-12/31/20	\$1,000,000
Adkins, DeAnna	Cortical Stimulation to Enhance Motor Recovery After Stroke	ACCEL Pilot	12/01/16-11/30/17	\$80,000
Alawieh, Ali	Targeted Complement Modulation in Stroke	AHA	07/01/15-06/30/17	\$50,000
Anderson, Kelly	Optimizing Post-Stroke Motor Learning Treatment Conditions	SCTR TL1	09/01/16-08/31/17	\$45,076
Bonilha, Leo	Brain Connectivity Supporting Language Recovery in Aphasia	NIH/NIDCD	06/10/14-05/31/19	\$1,672,440
Bonilha, Leo	Center for the Study of Aphasia Recovery (C-STAR) – Project 1 (POLAR)	USC	04/01/16-03/31/21	\$1,720,110
Bowden, Mark	Augmentation of Locomotor Adaptation Post-stroke	VA/RRD	07/01/13-06/30/18	\$923,700
Bowden, Mark	S.C.O.P.E.: Systematic Collection of Objective and Progressive Exercise	HealthSouth	09/01/16-08/31/17	\$8,728
Dean, Jesse	Influence of Lateral Stabilization on Walking Ability Post-stroke (R21)	NIH	04/01/16-03/31/18	\$164,603
Dean, Jesse	A Novel Mechanics-based Intervention to Improve Post-stroke Gait Stability	VA/RRD	01/01/17-12/31/20	\$941,400
Dean, Jesse	Development of a Novel Rehabilitation Device for the Improvement of Gait Stability	NSF	07/01/16-06/30/17	\$304,896
Dean, Jesse	Mechanism-based Strategies to Restore Post-stroke Gait Stability through Targeted Motor Adaptation	VA/RRD	03/08/17-02/28/19	\$406,581
Feng, Wayne	ASPIRE: Adult Spasticity International Registry on BOTOX Treatment	Allergan, Inc.	09/03/14-03/31/19	\$99,090
Feng, Wayne	Prediction and Imaging Biomarker for Post-stroke Motor Recovery	AHA	01/01/14-12/31/17	\$308,000
Emily Grattan/ Michelle Woodbury	Trans-cranial Direct Current Stimulation (tDCS) and Task-Specific Practice for Post-stroke Neglect	MUSC/NIH	07/01/16-06/30/17	\$36,095
Emily Grattan/ Michelle Woodbury	Examining Measurement of Behavioral Neglect Post Stroke	CHP	07/01/16-06/30/17	\$8,550

Active Grants Cont'd

Principal Investigator	Title	Funding Agency	Project Dates	Total Funding
Gregory, Chris	Skeletal Muscle Plasticity as an Indicator of Functional Performance Post-stroke	VA/RRD	10/01/13-09/30/17	\$1,099,900
Gregory, Chris	Stroke Comprehensive Care Project (SCCP)	VAMC Rural Health	10/1/16-09/30/17	\$509,990
Kautz, Steve	Research Career Scientist	VA/RRD	10/2014-09/2019	\$570,000
Kautz, Steve	National Center of Neuromodulation for Rehabilitation (NC NM4R)	NIH/NICHD	10/01/15-06/30/20	\$5,245,792
Kautz, Steve	The Effects of Impaired Post-stroke Coordination and Motor Pathway Integrity on Mobility Performance	VA/RRD	11/01/16-10/31/19	\$769,760
Seo, Na Jin	Altering Activation Patterns in the Distal Upper Extremity after Stroke (Sub-award)	RIC/NIH	05/01/14-06/30/19	\$293,822
Shih, Andy	Pericytes as Inducers of Blood-Brain Barrier Injury during Stroke	NIH	02/01/16-01/31/18	\$411,125
Arthur Riegel/ Andy Shih	Gating of Post-stroke Plasticity by Somatostatin Interneurons	Neuroscience Institute, pilot	08/01/16-07/31/17	\$15,000
Tomlinson, Stephen	Targeting Complement and Chronic Inflammation after Traumatic Brain Injury	VA/RRD	01/01/17-12/31/18	\$200,000
Tomlinson, Stephen	Novel Therapies to Improve Functional Recovery after Stroke	VAMC	04/01/14-03/31/18	\$1,100,000
Tomlinson, Stephen	Preclinical Characterization of Combined Post-Stroke Interventions with Rehabilitation	ACCEL Pilot	12/01/16-11/30/17	\$80,000
Woodbury, Michelle	Establishing the Functional Viability and Dose-response of Duck Duck Punch: A Stroke Rehabilitation Computer Game	RecoVR, Inc./NIH/NINDS SBIR	10/01/16-09/30/17	\$943,881
Woodbury, Michelle	Functional Assistance Provided by Myoelectric Elbow-Wrist-Hand Orthoses	Myomo, Inc.	09/19/16-10/31/17	\$75,280

COBRE Affiliated—New Awards

Principal Investigator	Title	Funding Agency	Total Funding
Dean, Jesse	Mechanism-based Strategies to Restore Post-stroke Gait Stability through Targeted Motor Adaptation (R21; Resubmission)	NIH/NICHHD	\$406,581
Seo, Na Jin	TheraBracelet: The First and Only Wearable to Instantly Improve Hand Function	TheraBracelet, Inc./NIH/NICHHD SBIR	\$101,595
Shih, Andy	Deciphering the Cerebral Microinfarct and its Role in Vascular Cognitive Impairment	NIH/NINDS/R01	\$2,915,672
Woodbury, Michelle	Partnership for Physical Rehabilitation Post-Stroke: Tier II Award	PCORI	\$50,000

COBRE Affiliated—New Grant Applications

Principal Investigator	Title	Funding Agency	Funding Requested
Bowden, Mark	SUPERBS - SUPlementing Extremity Rehabilitation with Behavior Supports (R21; subproposal)	NIH/NICHHD	\$42,626
Bowden, Mark	Incline Training to Personalize Motor Control Interventions after Stroke	VAMC	\$1,094,511
Grattan, Emily	Improving Measurement and Treatment of Post-stroke Neglect	VAMC	\$966,265
Gregory, Chris	Combining rTMS and Aerobic Exercise to Treat Depression and Improve Post-stroke Walking	NIH/NICHHD	\$3,304,267
Gregory, Chris	Muscle Power Training to Improve Post-stroke Depression	VAMC	\$1,084,900
Seo, Na Jin	Development of Post-stroke Hand Sensorimotor Orthotic for Home Use	NIH/NICHHD	\$600,000
Seo, Na Jin	Concomitant Sensory Stimulation During Therapy to Enhance Hand Function Post Stroke	VAMC	\$1,100,000
Seo, Na Jin	Concomitant Sensory Stimulation during Therapy to Enhance Hand Functional Recovery Post stroke	NIH	\$3,630,147
Woodbury, Michelle	Punching Ducks to Improve Hemiplegic Arm Movement	VAMC	\$1,066,100
Woodbury, Michelle	A Pilot Study of Long-term Home-based Telerehabilitation	NIH	\$104,388

STROKE RECOVERY RESEARCH CENTER

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