

VA RR&D CENTER *for* NEURORESTORATION & NEUROTECHNOLOGY



Issue 9

June 2018

Important Dates:

June 1 (12pm): C/NN
Brown Bag Lunch with
Jason Ritt, PhD

June 5: C/NN seed grant
submission deadline

June 12 (12-1pm): C/NN
Lunch & Learn with Emily
Graczyk, PhD

June 15: Summer RR&D
Merit verification deadline

August 1: LOIs for Fall
RR&D SPiRE submissions

September 15: Fall RR&D
SPiRE verification deadline

September 25 (4pm): C/NN
Seminar Series featuring
Rani Elwy, PhD

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**Want to ensure
you're kept in the
C/NN loop?**

Click [here](#) to be added
to the C/NN mailing list.

A Non-Medication Treatment Option for PTSD

Can virtual reality exposure augmented with a small amount of brain stimulation help treat posttraumatic stress disorder (PTSD)?

A team of C/NN physicians and scientists, led by Noah S. Philip, MD and Mascha van 't Wout-Frank, PhD, were recently awarded \$1.1 million from the VA ORD Rehabilitation Research and Development (RR&D) service to conduct research focused on identifying novel non-medication treatment options for Veterans with chronic PTSD. Their study is examining whether delivering a small amount of electricity to the brain – called transcranial direct current stimulation (tDCS) – can improve PTSD symptoms and ultimately quality of life when used in combination with virtual reality (VR).



Participants engage in virtual reality experience that simulates warzone scenarios (below); exposure occurs in a controlled setting (left) and is augmented with a small amount of electrical stimulation.



During VR, research participants will see simulated warzone situations that may resemble some of their experiences from deployment, but are now shown in a safe environment. Although these types of exposures are effective in reducing PTSD symptoms, people with combat-related trauma often continue to experience symptoms after treatment, which makes it hard to get back to everyday life. Previous research by Drs. van 't Wout-Frank and Philip show that non-invasive brain stimulation, such as tDCS, might be the key. tDCS may allow the brain to learn more quickly that feared situations are no longer dangerous. By stimulating an area of the brain, the ventromedial prefrontal cortex, which is often not sufficiently active in people suffering from PTSD, tDCS in combination with seeing VR warzone situations may effectively boost learning and memory that these situations no longer need to be feared. This results in reductions in physiological hyperarousal in reaction to seeing the VR simulated warzone situations, which is measured by the amount of sweat on the hand and heart rate. The reduction in physiological hyperarousal may reduce PTSD symptoms and increase quality of life in Veterans suffering from PTSD.

CfNN Collaborations: *Neuroimaging Biomarkers for Seizures*

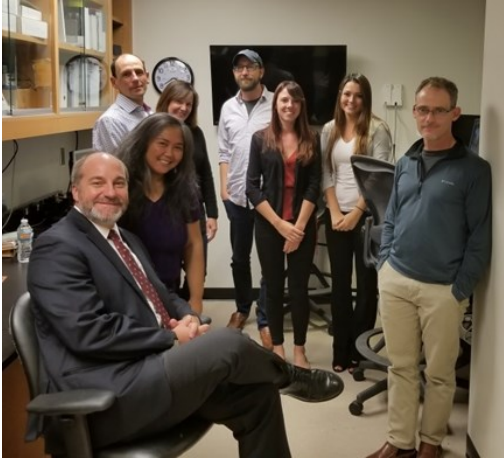


Photo: Members of the team met at the Brown MRF for cross-site imaging collaboration.

A new DoD funded multi-site study, led by Dr. W. Curt LaFrance Jr. (Providence VA Medical Center) and Dr. Jerzy Szaflarski (University of Alabama at Birmingham; UAB), is examining the effect of cognitive behavioral therapy on Veterans and civilians with epileptic and nonepileptic seizures (NES) resulting from a traumatic brain injury (TBI). Drs. LaFrance and Szaflarski and their research teams have a history of successful collaborative research studies. Their previously completed studies include a pilot multi-site randomized control trial of combined therapy for patients with NES ([LaFrance et al, JAMA Psychiatry 2014](#)).

While this study aims to reduce the frequency and severity of seizures, another key aspect involves analyzing and comparing the brain changes of these individuals to individuals with TBI without seizures. "Building off of our previous pilot studies, this will be the first large scale examination of the neuroimaging brain signals in response to an intervention for patients with seizures," said Dr. LaFrance.

This study is enabled by collaboration between Providence (RI) and Birmingham (AL) VA Medical Centers, Rhode Island Hospital, UAB, and the Brown University MRI Research Facility (MRF).

Investigators at CfNN are always looking to collaborate. If you're interested or would like to learn more about working with us, please contact Kate Barnabe (ext. 6272).

Get to know the CfNN team: R25 Research Residents

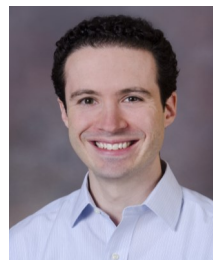
The Center for Neurorestoration and Neurotechnology (CfNN) is committed to facilitating the training and mentorship of new generations of clinician-scientists. The National Institute of Mental Health affords a select group of Brown University psychiatry residents the opportunity to receive training and protected research time through the R25 research training grant. Currently, CfNN is fortunate to have four outstanding R25 psychiatry resident physicians conducting research under the direction of CfNN leadership and collaborators.



Amin Zand Vakili, MD, PhD

Dr. Zand Vakili uses electrophysiological data (EEG) to examine brain function and employs computational modeling and machine learning to investigate the use of EEG data for individualizing the treatment of psychiatric disorders. His primary focus is understanding the

relationship between non-invasive brain stimulation and brain activity.



Yosef Berlow, MD, PhD

Dr. Berlow's research is focused on using clinical symptom profiles and neuroimaging to develop algorithms to predict response to transcranial magnetic stimulation in

individuals with post-traumatic stress disorder.



Rachel Blackman, MD, PhD

Dr. Blackman is currently looking for participants for her study that examines thinking and memory in Schizophrenia and related disorders. Her main focus is understanding brain mechanisms related to cognitive dysfunction in patients with schizophrenia and

schizoaffective disorders.



Paul Bowary, MD

Dr. Bowary is interested in identifying methods for predicting patient response to different non-invasive approaches, such as using focused ultrasound, for treating somatic symptom

disorders and pain.

Interested in our research?

Below is a list of active studies that are currently being run under the direction of CfNN Principal Investigators (¹Greenberg, ²Correia, ³Philip, ⁴Frank, ⁵LaFrance, ⁶Hochberg, and ⁷Shea). For more details regarding a specific project, call **401-273-7100** followed by the provided extension(s).

Studies involving individuals with	Study Title	Ext.
Heart Failure	<i>The Effects of Inspiratory Muscle Training on Cognition and Functional Capacity in Older Adults with Heart Failure</i> ²	x2173
Head Injury	<i>Neuroimaging Biomarker for Seizures</i> ⁵	x6229
ALS Brain stem stroke Cervical spinal cord injury	<i>Feasibility of the BrainGate System for Veterans with ALS</i> ⁶	x6221
Schizophrenia Schizoaffective Disorder <i>*Plus persons in general good health</i>	<i>Cognitive Control Processing in Schizophrenia</i> ³	x4449
Anxiety <i>*Plus persons in general good health</i>	<i>Modulating Context Generalization through transcranial Direct Current Stimulation</i> ⁴	x3504
PTSD	<i>Comparative Effectiveness of Two Treatments for Veterans with PTSD</i> ⁷	x6251
	<i>Synchronized TMS for Posttraumatic Stress Disorder and Comorbid Depressive Symptoms</i> ³	x6254
	<i>Combined Transcranial Direct Current Stimulation and Virtual Reality for PTSD</i> ³	x4328 x6200
General good health	<i>Mapping Neural Mechanisms of Mindfulness-Based Care for Chronic Pain Treatment</i> ¹	x4449
	<i>White Matter Integrity and Sleep Complaints in Mild Traumatic Brain Injury</i> ²	x6221 x2173
	<i>Closed-Loop Feedback Control for Transcranial Direct Current Stimulation</i> ³	x6256

New studies are always starting up at CfNN. To learn more about the projects listed above as well as hear about other research opportunities, please contact Marguerite Bowker (ext. 6221).

A Veteran's Research Perspective

James J. Buckley Jr. (pictured below) is an Army and National Guard combat Veteran. He is a peer support specialist at the Providence VAMC, was featured on the Rhode Island Brain Week panel in 2017, and is an ambassador for CfNN research studies. He is a proud father, grandfather, husband, and student.



Buckley has participated in three PTSD-related research studies at the Providence VAMC, which involved trying novel medication and treatments aimed at reducing the nightmares, anxiety, and focus issues associated with his PTSD.

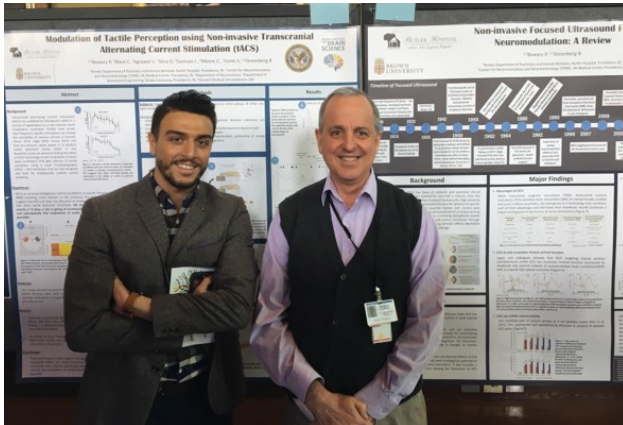
What does Buckley have to say about being included in research?

"It was a great experience! I finished the [TMS] study just before the holiday season and for years prior, for the holiday season, I always looked at it like if I could just go to sleep on Halloween and wake up on the day after New Year's I'd be happy. It was like being in a fishbowl-- the holidays going all around you and everything and I'm like 'yeah but I'm not into this.' Whereas upon completion of TMS I enjoyed the holiday, it wasn't stressful, I noticed a change. I don't know if it will help you, but how do you know if you don't try? Go into the research with an open mind!"

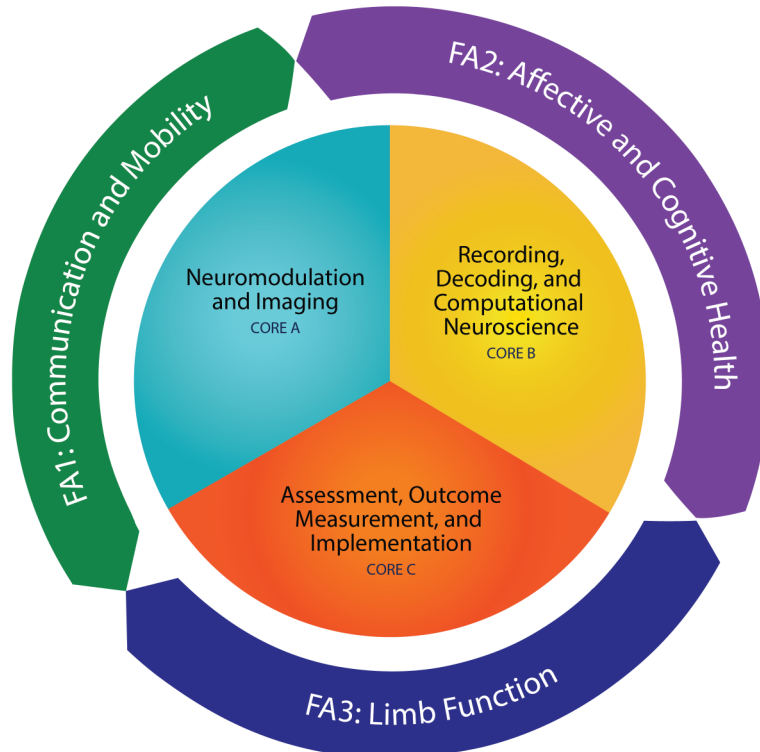
Thanks, James! We look forward to seeing you and other Veterans in future CfNN studies!

Annual Mind Brain Research Day

On March 27th, CfNN Investigators and research staff presented a total of 20 posters at the 2018 Brown University Mind Brain Research Day. *Pictured below: CfNN Associate Director, Benjamin Greenberg, MD, PhD (right) and his mentee, Paul Bowary, MD (left) in front of their respective posters.*



The VISION of the CfNN is to develop, test, and implement new therapies and technologies that restore function for Veterans with disorders affecting the nervous system.



Director's Corner

It is my great pleasure to report the renewal of the VA RR&D Center for Neurorestoration and Neurotechnology (CfNN).

Over the past 18+ months, we have received valuable, iterative, thorough feedback from the site visit team, our review team, and RR&D leadership. They have all been impressed with the quality of science at CfNN and the depth of our commitment to improving Veterans' health.

I'm deeply grateful for everyone's comradery, innovation, hard work, and persistence in getting this five year competitive renewal across the finish line. I'd also like to highlight the boundless energy and insights provided by Ben Greenberg, Kate Barnabe, and David Rosler; this renewal would have never happened without their dedication over nearly the past two years.

Now is the time to turn our proposals and checklists into action plans, or as Focus Area 1 (FA1) would report, to turn our thoughts into action. I look forward to working with all of you as we advance CfNN's important mission.



**Leigh Hochberg, MD, PhD,
FAAN, FANA**

Visit us online to learn more about CfNN and stay up-to-date with our offerings and progress!

<https://www.providence.va.gov/research/CfNN/>