ATLANTA VA REHABILITATION **RESEARCH & DEVELOPMENT SUMMER 2022**

CENTER FOR VISUAL AND NEUROCOGNITIVE REHABILITATION

Investigator Spotlight



Dr. Arash Harzand

Incide this issue

Arash Harzand, MD, MBA has always embraced trying new things and pushing boundaries. He recently joined the CVNR as an investigator in the Spring of 2021, although he was actively involved as a collaborator prior to then. In 2016, along with fellow VA cardiologist and technophile Dr. Amit Shah, he began to pilot a

new way of delivering cardiac rehabilitation to Veterans with ischemic heart disease remotely, using smartphones and connected devices, even though the VA hadn't yet fully embraced adopting mobile health technologies as a routine part of Veteran care. The need to deliver new solutions that expand access to healthcare services for Veterans with heart disease led him down a journey that persisted throughout his clinical cardiovascular training and ultimately landed him at the CVNR.

Originally born in Iran, Dr. Harzand is more recently a native of south Florida. He attended the University of Florida and went on to complete a combined Doctor of Medicine/Master of Business

Administration degree program at the University of Miami in 2011 before moving to Atlanta to begin his training at Emory University. After clinical completing his Internal Medicine residency in 2014, he served as Chief Resident for Quality and Patient Safety at the Atlanta VA from 2014 to 2015 and completed his Clinical Cardiovascular Disease fellowship in 2018 with a focus on peripheral vascular disorders. He now serves as the Director of both Vascular Medicine and Digital Cardiology at the Atlanta VA Medical Center, in addition to his time at the CVNR.

As a clinical fellow, Dr. Harzand continued to develop Smart HEART (Health Education & Rehab Technology) into a comprehensive virtual cardiac rehabilitation program that has provided services to almost 400 Veterans thus far. It was through this

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Featured Column

Eyes Front!

A series focusing on major diseases involving vision and the eye.

In this issue: Glaucoma

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work that he met other CVNR investigators including Drs. Joseph Nocera and Keith McGregor, both of whom had explored various ways of integrating digital health tools into research studies. In 2021, Dr. Harzand received a Rehabilitation R&D CDA-2 award that combined his shared passions of clinical care, digital health, and vascular medicine to study how best to integrate mobile health tools into a home-based exercise program for Veterans with peripheral artery disease or PAD. His study aims to extend the knowledge gained from delivering virtual home-based rehabilitation for heart disease patients to those with lower extremity PAD.

Dr. Harzand is always thinking about how to translate new findings into clinical care. The challenge has been that the VA, despite its role as an early leader in telehealth, has struggled in recent years to bridge the digital divide in the rapidly advancing age of mobile health devices and cloud computing. That's why in 2020, after the start of the pandemic, Dr. Harzand applied for and was selected as one of two Senior Innovation Fellows with the VHA Innovation Ecosystem to focus on designing an enterprise solution that would allow Veterans to more seamlessly share their patient generated health data with clinicians and researchers at VA. In partnership with the Office of the Chief Technology Officer, Dr. Harzand and a diverse team of engineers, designers, and clinicians from around the country have began developing a Digital Health Platform that would integrate directly with any patient-owned or VA-provided mobile health solution through open-access protocols. Dr. Harzand hopes that once solutions like the Digital Health Platform become available, clinicians and investigators can spend more of their time discovering and integrating digital health solutions within VA.

In his spare time, Dr. Harzand enjoys hiking and exploring new and remote cultures across the world. Some of his favorite expeditions have been to the Torres del Paine national park in Patagonia, Chile, Iceland, and most recently to Denali National Park in Alaska.



Atlanta VA Research Day

The Atlanta VAHCS held its annual Research Day on May 19, 2022, hosted at Emory University School of Medicine. It featured the Inaugural Robert J. Pollet Memorial Lecture presented by Dr. Steven Dubinett, an internationally recognized physician-scientist from UCLA. The CVNR was well represented at the event. Dr. Machelle Pardue and Dr. Camille Vaughan served on the Organizing Committee, Dr. Katie Bales served on the Awards Subcommittee and Ms. Lisa Calas helped with logistics. Everyone enjoyed Dr. Pardue's Atlanta VA Highlight talk. CVNR researchers presented posters, and two teams received second place awards in their respective categories for the poster competition. Dr. Rachael Allen and colleagues were selected for their work: "Dopamine treatment delays diabetic retinopathy onset in a retrospective study". Dr. Chiamaka Ohanu and colleagues were selected for their work: "Vagal Nucleus Connectivity Predicts Percutaneous Electrical Nerve Field Stimulation Treatment Response in Veterans with Fibromyalgia".













Dr. Michael Dattilo

What is Glaucoma?

Glaucoma is a blinding disease that causes damage to the optic nerve, which sends information from the eye to the brain. It is commonly known as a "silent disease" because most people are unaware they are losing vision.

In glaucoma, central vision, or how well you see directly in front of you, is typically unaffected early in the disease. However, peripheral vision, or side vision, can be significantly lost. Without treatment, you will continue to lose vision until you become fully blind. Nearly half of Americans with glaucoma are unaware of vision loss in the early stages of glaucoma. There are two major types of glaucoma called primary and secondary glaucoma, but in the United States the most common form is primary open-angle glaucoma. **The only way to be correctly diagnosed and treated is by scheduling regular appointments with a trained eye care professional.** During an eye exam for glaucoma, you may be given a "side vision test" (visual field test) to determine the total area each eye can see. Your eyes may be dilated to



allow inspection of the back of the eye to detect signs of glaucoma. Vision loss caused by glaucoma is permanent, but you can help protect your vision by getting diagnosed early and by getting treated.



For more information about vision, eye health and disease please visit: http://nei.nih.gov/health NIH National Eye Institute

The Human Eye



During your eye exam, the eye doctor (ophthalmologist or optometrist) will examine the back of your eye looking at the optic nerve head to determine if you have glaucoma. If there are signs of glaucoma, your doctor will discuss treatment with you to help preserve/protect your vision. Currently, all treatments aim to lower pressure within the eye.

Next segment:

Macular degeneration - a leading cause of vision loss in older adults

Participant Perspective: Aphasia Research



Dr. Maryanne Weatherill, Reginal Robinson, Erika Robinson , and Elizabeth Tibus

As a result of a stroke, Mr. Reginal Robinson has a condition called aphasia, which affects his ability to communicate. Mr. Robinson has participated in several studies being conducted at the CVNR and provides insights into his experience as a research participant.

He feels that participating in aphasia research helps him to learn more about aphasia and his "new" lifestyle while participating in projects that can change the lives of others and increase their quality of life. He further explains the rewards of participation: "The best thing about participating is the feeling of accomplishment. In this process my knowledge is tested, and it feels good to see what I still remember. It has helped me with feeling like I've learned something and feeling like I've helped someone else with the research."

He believes that research can help others through a better understanding of how the brain works and by providing information to the community that can help others to deal with aphasia.

Mr. Robinson encourages others to participate in research and sees the benefit from both sides. "It's a two-way street. You will gain something and also give something. It's actually fun and stimulating." For anyone participating in studies which use MRI scanning he advises, "going into the MRI isn't for everyone so be prepared for a tight space and loud noises."

His sisters, Erika Robinson and Evangeline Tisdale are active supporters of their brother and his journey. They recognize the good work being conducted in aphasia research through the CVNR. "It has been important for my brother to participate as it gives him a sense of purpose again. It makes him feel better about himself, his abilities, and his pride of accomplishing a task. Reggie has been really excited about the research participation. He hasn't really been excited about much since his stroke. Both his speech and understanding have been impacted in a positive way."



New Neuroimaging Core Director



Jennifer Stevens, PhD is a cognitive neuroscientist who recently joined the Center for Visual and Neurocognitive Rehabilitation (CVNR) at the Atlanta VA, as Director of the Neuroimaging Core. She is also an Assistant Professor in the Department of Psychiatry and Behavioral Sciences at Emory University. Her work focuses on the impacts of trauma and posttraumatic stress disorder on brain function.

Her lab at Emory, the Grady Trauma Project, is a collaborative group that is one of the world's largest studies of civilian trauma and its impacts on the brain and mental and physical health.

Her current studies focus on identifying brainbased factors that contribute to the maintenance posttraumatic stress disorder of (PTSD) symptoms over months and years. The goal of work is to understand neural risk this mechanisms that could be directly targeted in the first few hours or days after a trauma exposure, when many patients are making contact with the healthcare system. New early-intervention clinical trials can target these mechanisms to prevent the emergence of PTSD.

Dr. Stevens also studies how hormones change the way that the brain forms fear memories. Much of the current science on sex differences in PTSD is confounded by the fact that studies of men have typically focused on veteran populations, while studies of women have typically focused on civilian interpersonal trauma. She hopes to disentangle some of these differences working across both military and civilian groups.

Dr. Stevens has authored over 90 publications focusing on the neuroscience of trauma and resilience, and her work has been honored with early career awards including Emory's 2021 Woodruff Scholar Early Independence Award, and a BIRCWH K12 from the Office of Research on Women's Health. She lives in Marietta, where she enjoys gardening and soccer with her husband Kit and sons Attley (age 5) and Strafford (age 7). She is not sure if reading actually counts as a hobby, but is a big fan of her local library and used bookstores.

As Neuroimaging Core director at the CVNR, she working to make cutting-edge is neuroimaging biomarkers accessible to scientists across a variety of disciplines, to support the vibrant multidisciplinary research community at the Atlanta VA. The NIC team is developing a set of software tools and educational materials that will help make neuroimaging more accessible to the community, to enhance collaboration within the Atlanta VA and cross-institutionally, and to facilitate the development of neuroimaging biomarkers to track brain health across the course of rehabilitation in veterans.

Check out the Neuroimaging Core's new github page here, which contains pipelines, information on infrastructure, and how-to guides and manuals - https://github.com/CVNR/nic_intro

Diversity, Equity and Inclusion Student Support

The CVNR introduced a new funding mechanism this year to support research experiences for students from diverse backgrounds. In the inaugural group we are supporting four students.



Trozalla Smith is a Research Assistant working under Dr. Anna Woodbury studying non-opioid management of Fibromyalgia in Veterans. Fibromyalgia is a chronic pain syndrome that causes widespread pain, tenderness in the joints, moderate to severe fatigue as well as sleep disturbances. Dr. Anna Woodbury's studies examine 1) Cranial Electrical Stimulation (CES) to improve pain and functional impairment in veterans with fibromyalgia, and 2) Transcranial Magnetic Stimulation (TMS) of the prefrontal cortex to treat pain and co-morbid symptoms in Gulf War Syndrome. CES is a non-invasive therapy that patients can take home and self-administer. TMS is a non-invasive treatment using an h-coil device placed on a patient's scalp resulting in little to no disturbance to daily activities.

Trozalla is from San Leandro, California, and is majoring in Human Health at Emory University. She plans on obtaining an MD/Ph.D. post grad with hopes to practice medicine, teach and continue researching alternative pain-relieving modalities. In her spare time, she loves to make memories with her nieces and nephews, writing and quilting. Trozalla's favorite part about working at the VA is meeting other people struggling with chronic pain and being a part of creating hope for patients.

Patria Juzang is a research assistant for Dr. Todd White focusing on discovering and developing effective therapies to treat neurotrauma. Currently she's assisting on his study "Effects of repetitive mild traumatic brain injury on weight gain and chronic behavioral outcomes in male rats."

Patria was born and raised in Huntsville, Alabama, and attended Oakwood University where she graduated with a Bachelor of Science degree in Biochemistry in 2017. During her free time, Patria enjoys singing with her sisters, traveling, and playing her favorite sportsbasketball and tennis.

During her time here, Patria has really enjoyed learning more about neuroscience and studying the effects of TBI. She also appreciates working in the CVNR because she is inspired, daily, by the dedication



and passion the people here have for research which ultimately greatly benefits the Veterans and general population. Patria will be continuing her education this fall in optometry school where she will combine her passions for neurology research and vision and pursue further education in Ocular Disease and Neuro-Optometry.

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Eli Chlan is a neuroscience Ph.D. student at Emory University who focuses his research on diabetic retinopathy with Dr. Machelle Pardue. Together, they are interested in detection and treatment of early-stage diabetic retinopathy for protection against vision loss.

Eli grew up in Watkinsville, GA and attended the University of Georgia where he graduated with B.S. degrees in biology and psychology. When not in the lab, Eli spends his time making all kinds of art. Currently, he is focusing on learning mask making and puppetry. He plans to use art as an engaging and interactive way to communicate

Maame Owusu-Ansah is a Biomedial Engineering Ph.D. student working with Dr. Machelle Pardue. Her current project is "Levodopa and diabetic retinopathy study," which aims to determine the optimal dosing frequency of levodopa to restore and maintain normal retinal function in people with diabetes.

Maame was born in Ghana, but she has lived in several states on the East Coast, including New York, Ohio, and Delaware, but her family currently resides in Gainesville, GA. She enjoys spending time outdoors, hiking, and gardening in her spare time.

Her favorite part about working at the VA is seeing and working with patients who could potentially benefit from her research. After Maame's PhD., she hopes to work in science policy.



Partner Highlight



The Foundation for Atlanta Veterans Education and Research, Inc. (FAVER) was established in 1989 to advance Veteran and public health through innovative research. FAVER is set up to provide a flexible mechanism to cost allocate expenses associated with the provision of Foundation for Atlanta Veterans Education and Research standard services necessary in the performance of research, and to

prevent needless duplication of scientific resources within our research community. FAVER administers research and education projects conducted at the Atlanta VA where funds are provided by non-VA sources.

FAVER has collaborated with and supported principal investigators from the CVNR through grants management since the early 1990s. A recent example is a Department of Defense grant in collaboration with the San Diego VA and its VA-affiliated nonprofit, Veterans Medical Research Foundation, originally under the direction of Dr. Keith McGregor and now being conducted by Dr. Anna Woodbury. As part of the conduct of this study, FAVER has hired personnel, ordered supplies and equipment, and paid study subject visits and procedures related to the conduct of this study.

Please contact Leslie Hughes, Executive Director (404.321.6111 ext. 122535), leslie.hughes2@va.gov or Marcia Weese, Grants and Contracts Specialist (404.321.6111 ext. 127897), marcia.weese@va.gov to further discuss how FAVER can support your non-VA funded research and/or education awards.

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New Research Funding



Dr. Pardue

Machelle Pardue, PhD received VA Merit funding for "Treating Early Stage Diabetic Retinopathy". The study is focused on diabetic retinopathy--a complication of diabetes that can lead to vision loss and blindness. Current detection of diabetic retinopathy is based on pictures of the inside of the eye to look for abnormal retinal blood vessels. These abnormalities can take 10-15 years to develop in patients with diabetes. In this study, Dr. Pardue will use a functional test to record the response of the retinal neurons to a flash of light. She previously showed this response to be an early biomarker for diabetic retinopathy. Furthermore, her lab demonstrated that these early functional changes could be prevented by levodopa treatments. This newly funded study will translate previous pre-clinical work into a clinical trial.



Dr. Bales

Katie Bales, PhD recently received a VA Career Development Award 2 to study the morphological, gene expression and functional alterations that promote retinal neuroprotection in retinal astrocytes and vasculature. Photoreceptor dysfunction is one of the hallmark pathologies associated with retinal degenerative (RD) diseases that manifests in patients as a progressive loss of vision. This encompasses heterogenous diseases such as retinitis pigmentosa, which affects 1 in 3500 people worldwide and age-related macular degeneration, which is projected to affect 288 million people by 2040. Previously, we have shown modest exercise provides retinal neuroprotection in a mouse model of RD, through increased brain derived neurotrophic factor (BDNF) signaling. The cellular modifications provoking neural protection and repair from exercise are not understood. Our studies will illuminate the roles of retinal astrocytes and vasculature in this known neuroprotective therapy, ultimately optimizing exercise-based therapeutics and creating new pharmacological strategies targeting the underlying mechanisms of exercise-induced protection.



Dr. Yu

Shan Ping Yu, MD, PhD received VA SPiRE funding to explore a novel memantine (MEM) treatment during the early stage of Alzheimer's disease (AD) mice with the goal of antagonizing AD progression and possible stroke attacks. AD and stroke are common neurological disorders that often occur in the same aging veterans and are risk factors for each other. Noticeably, AD and stroke share some common pathophysiological mechanisms such as NMDA receptor (NMDAR) hyperactivation-induced excitotoxicity and neurovascular destructions. MEM is an FDA-approved NMDAR antagonist, recommended as a symptomatic treatment for moderate to severe AD patients. The therapeutic strategy targeting NMDAR hyperactivity and brain preconditioning may provide clinical benefits for veterans who are vulnerable to AD and stroke.

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A.M. Barrett, MD received VA Merit funding for "Prism therapy for right brain stroke adaptation (PAT) rehabilitation." Over 50% of Veterans experience problems with dressing, eating, self-care or steering their wheelchairs after a right brain stroke. Their ability to move and respond toward the left side is limited: a problem called spatial neglect, which devastates their independence. An effective treatment for spatial neglect is visuomotor training while wearing optical prisms (PAT). However, although the Atlanta Occupational Therapy team (see picture at left) is expert at spatial neglect care, a barrier to receiving PAT is that many clinicians fail to

diagnose spatial neglect or choose ineffective treatment approaches. In this study, Dr. Barrett's team will develop a method that could identify Veterans with spatial neglect based on the brain scans performed during stroke care. When the research is complete, the team hopes that brain scan analysis in the hospital can guide the clinical team to refer Veterans to PAT rehabilitation and improve their quality of life.

New Staff Members

Anna Ree is a research coordinator currently working on studies with Dr. Anna Woodbury examining cranial electrical stimulation and measurements of fibromyalgia pain and Dr. Amy Rodriguez studying the efficacy of different treatment schedules and methods for stroke patients.

A Georgia resident all her life, Anna is a new graduate of Emory University with double majors in Psychology and Vocal Performance and an avid love of research and the arts. Her spare time is spent singing with the Emory University Chorus and St. James United Methodist Church. Any time around the edges is spent looking for more artistic opportunities and spending time with her family and friends.

Her favorite part of working for the VA is the drive behind VA and CVNR research to move past the surface and solve problems at their source. The fact that current research could lead to the improved wellbeing of Veterans fuels that drive to progress.





Mykayla Jeter is a research coordinator working with Dr. A.M. Barrett on her study "Biomarker for personalized Care in Post-Stroke Spatial Neglect". She grew up in West Palm Beach, Florida, but moved to GA 9 years ago to pursue higher education. Mykayla attended Georgia Highlands College and Georgia State University where she received a B.S. in Psychology in 2019, and an M.S. in Neuroscience in 2022. Mykayla enjoys kayaking, hiking with her 4 dogs, and building her non-profit, STEM and Roots, which promotes STEM education for minority groups paired with plant care. Her favorite part of living in Atlanta is the various cultural foods available.

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Active Studies

| | Study Name | Eligibility | Contact Info |
|-------------------------------|---|---|---|
| Aging Studies | Graded Intensity Aerobic Exercise to Improve Cerebrovascular Function and Performance in Aged Veterans | Inclusion: No regular exercise participation in last 6 months Physician approval to participate in exercise Ages 18-35, ages 65-80 | Medina Bello 404-825-8820 |
| | Aerobic Exercise and Cognitive Training in Older Adults | Inclusion: 55-89 years of age No regular exercise participation in last 6 months Physician approval to participate in exercise | Katie Bales 404-321-6111 x206583 |
| | Effects of Aging on Cortical Excitability During Motor Learning | Inclusion: • 18 and older Ages 18-35, ages 60-80 | Medina Bello 404-825-8820 |
| Spatial Neglect Studies | Prism Adaptation and Left-Brain Stroke Rehabilitation | Inclusion:Have aphasia caused by stroke Be 18-89 years old | Maryanne Weatherill 404-321-6111 x207344 |
| | Standardization of Innovative Brain Assessment (IBA) | Inclusion: • Age 18 and older • Spatial neglect • Aphasia Other cognitive impairments | Dr. A.M. Barrett 404-321-6111 x202776 |
| Parkinson's Studies | Partnered Dance Aerobic Exercise as a Neuroprotective, Motor & Cognitive Intervention in Parkinson's Disease | Inclusion: • Parkinson's Disease Age 40-89 | Cathleen Carroll-Sauer 404-618-2683 |
| | Behavioral or Solifenacin Therapy for Urinary Symptoms in Parkinson's Disease | Inclusion: Parkinson's Disease Bothersome Urinary Symptoms Attend Clinic & virtual appointments | Taressa Sergent 404-315-4100 x373124 |



Continued on next page

| | Study Name | Eligibility | Contact Info |
|--------------------|---|---|---|
| Pain Studies | rTMS in Alleviating Pain and Co- morbid Symptoms in Gulf War Veterans | Inclusion: Age 65 and younger Served in the Gulf War in 1990-1991 Have headaches, muscle and joint pain Moderate to severe depression | Carly Ragin 678-408-1433 |
| | Long Term Efficacy of Neuronavigation Guided rTMS in Alleviating Gulf War Illness Related Headaches and Pain Symptoms | Inclusion: Age 65 and younger Served in the Gulf War in 1990-1991 Have headaches, muscle and joint pain Minimal to mild depression | Carly Ragin 678-408-1433 |
| | Randomized Double-Blind Placebo-Controlled Trial: fMRI Assessment of Cranial Electrical Stimulation for Fibromyalgia in Veterans (AVAMC) | Inclusion: • Age 20-60 • Fibromyalgia | Anna Ree 404-321-6111 x202561 |
| Aphasia Studies | Intention Treatment for Anomia: Investigating Dose Frequency Effects and Predictors of Treatment Response to Improve Efficacy and Clinical Translation | Inclusion:Have aphasia caused by stroke Be 21-89 years old | Maryanne Weatherill 404-321-6111 x207344 |
| | Beyond Lesion-Language Mapping in Aphasia: A Novel Imaging-Based Prediction Model | Inclusion:Stroke with AphasiaAges 20-80Right handed | Lisa Krishnamurthy, PhD 404-536-4894 |
| | Multimodal Neuroimaging: Advanced Tracking of Longitudinal Aphasia Recovery | Inclusion: Male or female age (45-89) who are 2-6 weeks post ischemic stroke. English primary language Subjects must be willing to participate and understand the consent. | Isabella Paredes Spir 404-417-2992 x202992 |
| Registry | Atlanta VA Rehab R&D Center for Visual and Neurocognitive Rehabilitation Participant Registry | Inclusion: • 18 and older | 404-728-5064 |



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U.S. Department of Veterans Affairs Atlanta VA Health Care System



Dr. A.M. Barrett CVNR Executive Director Dr. Barrett is a clinicianscientist, with special expertise in both cognitive neurology and neurorehabilitation.

A Word from Our Director

Welcome back to the laboratory, office and clinical spaces! Together with everyone else around the world, the CVNR is adjusting to a new normal. Through the dedication of our investigators and staff, we are shaking off the uncertainty of the past 2 years and venturing boldly into the next phase with renewed enthusiasm. We are honing our focus on the research areas that make our center unique in the VA, and address our mission: to investigate new solutions to eye and brain disability using leading-edge technology.

We have been re-approaching our Center focus, and as new investigators join the CVNR and new studies are designed, we will be doubling down on eye and brain rehabilitation, to improve the quality of life for Veterans. None of this would be possible without the Veterans and civilians who trust us with their health and their time while participating in our research studies.

To all of our stakeholders, thank you for participating though the COVID-19 pandemic and returning in great numbers as we slowly transition to the next phase here at the Atlanta Veterans Health Care System. We honor you who have served our country, always and even more in the summer, when we celebrate our hard-fought independence.

Please enjoy our Summer 2022 CVNR newsletter, which highlights investigators and staff – we also provide some helpful information about glaucoma. Your voice is important, and I am always available to listen. We are glad you are part of our community to serve!