

VA



U.S. Department of Veterans Affairs

Veterans Health Administration
Office of Research & Development

VA Research Day On The Hill

Thursday, June 20, 2019
Rayburn House Office Building – FOYER
Washington, DC 20515
10 am – 2 pm

You are cordially invited to

VA RESEARCH DAY ON THE HILL

featuring

SCIENTIFIC EXHIBITS

&

INTERACTIVE DEMONSTRATIONS

opening remarks begin at 11 am

Rachel Ramoni, DMD, ScD
VA Chief Research and Development Officer

Carolyn Clancy, MD
VA Deputy Under Secretary for Health for Discovery, Education, and Affiliate Networks

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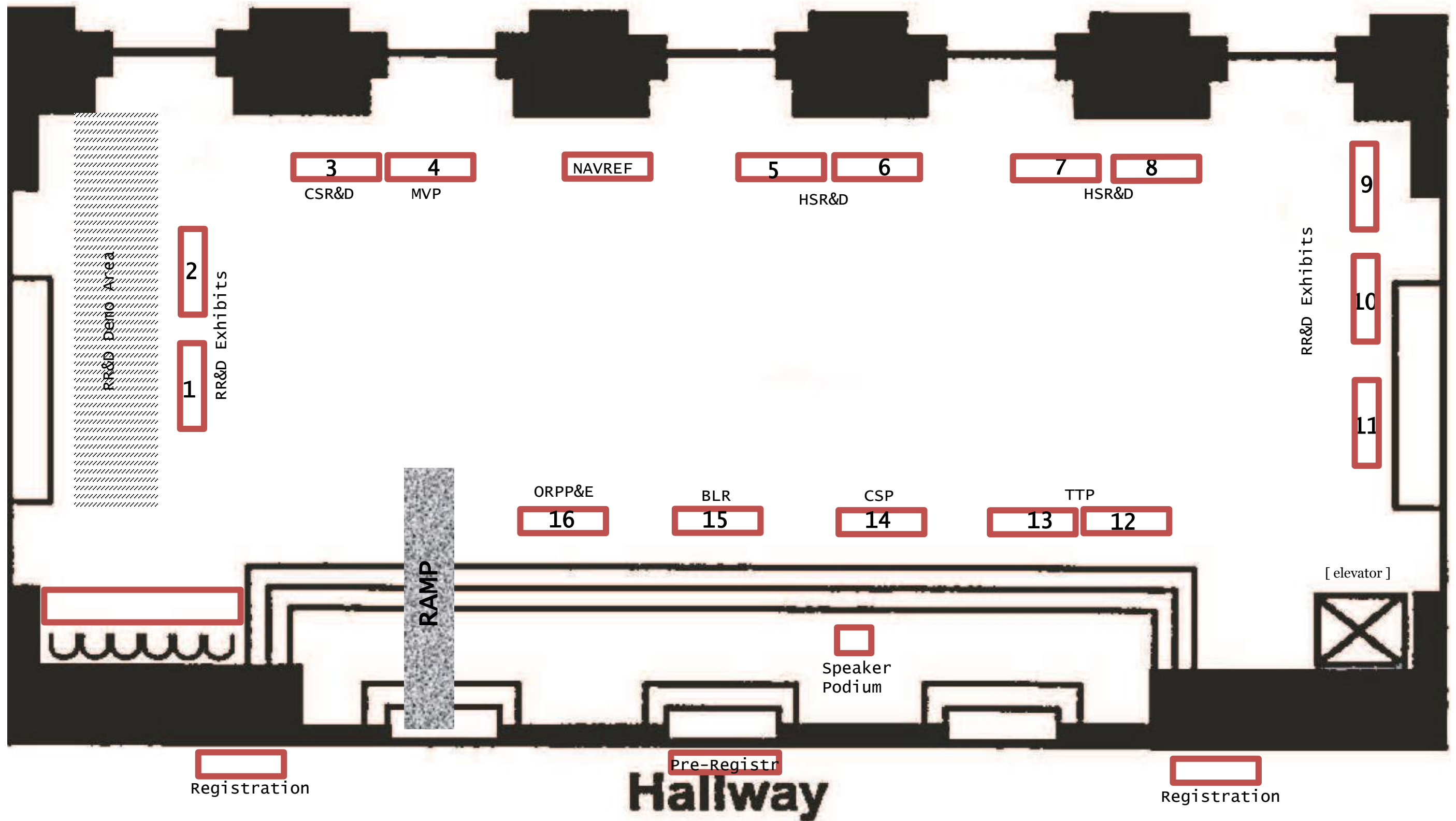




Project Title	Area of Research	Study Location	Study Lead	Table
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Project Title	Area of Research	Study Location	Study Lead	Table
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VA Research Day on the Hill – Thursday, June 20, 2019 10am-2pm



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Combined Transcranial Direct Current Stimulation and Virtual Reality for PTSD

VA RR&D Center for Neurorestoration and Neurotechnology, Providence VA Medical Center

Why this research is important:

Posttraumatic stress disorder (PTSD) in Veterans is associated with serious problems in family, social, and work functioning and overall poor quality of life. Current treatment options have limitations both in terms of tolerability and effectiveness. Hence, innovative treatment interventions are critically needed for Veterans with PTSD.

Summary:

This new and innovative approach uses non-invasive brain stimulation to change brain regions involved in PTSD. To maximize gains, stimulation can be combined with psychotherapy approaches. This project uses transcranial direct current stimulation (tDCS) to deliver approximately the same electricity as a nine-volt battery to targeted brain regions. The treatment has few to no side effects. Stimulation is delivered to the ventromedial prefrontal cortex, a brain region that is not functioning sufficiently in people with PTSD. Stimulation is applied while Veterans are immersed in a virtual-reality exposure experience of Iraq or Afghanistan. Brain changes are measured over time using advanced functional magnetic resonance imaging. Our hypothesis is that the combination of tDCS and virtual reality—compared to a placebo condition with virtual reality—will reduce clinical symptoms and improve quality of life in Veterans.

How the research will improve Veterans' lives:

This study may lead to a new, non-pharmaceutical, easily deployable treatment for PTSD.



Dr. Noah S. Philip



U.S. Department of Veterans Affairs

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Office of Research & Development

VA Research Highlight

Implementing Transcranial Magnetic Stimulation (TMS) as a Treatment for Veterans with Chronic Pain Condition and Posttraumatic Brain Injury-Related Headaches

VA San Diego Healthcare System; VA Palo Alto Health Care System; Atlanta VA Health Care System

Why this research is important:

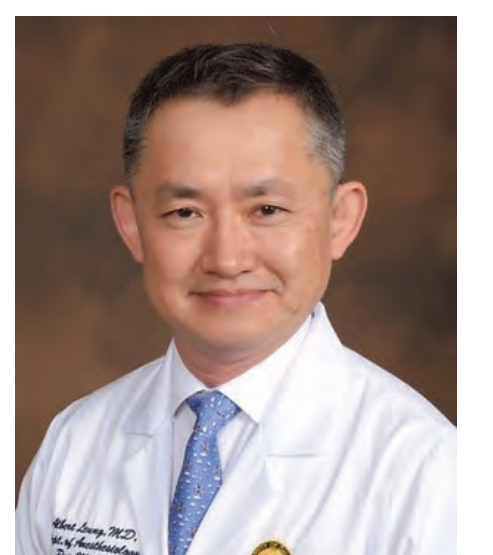
Persistent headache is prevalent in a majority of Veterans with traumatic brain injury. Chronic headache and diffuse body and joint pain are common in Veterans who served in the first Gulf War (1990–1991). These chronic pain and headache conditions significantly impact the quality of life for Veterans and their caregivers. Unfortunately, the efficacy of currently available drug intervention in pain management is limited, and pain killers have many untoward side effects and abusive potential.

Summary:

To address this treatment gap and the national opioid crisis that is affecting the Veteran population, our research focuses on the use of transcranial magnetic stimulation (TMS), which utilizes electromagnetic coupling mechanisms to non-invasively enhance Veterans' brain pain modulatory functions by stimulating the motor and/or the dorsolateral prefrontal cortex under MRI guidance.

How the research will improve Veterans' lives:

Previous studies have demonstrated that a short (3–4 sessions) course of treatment can significantly reduce frequency and intensity of headaches. Stimulating the dorsolateral prefrontal cortex also demonstrated a mood-enhancing benefit for patients with comorbid severe depression. For immediate implementation, we established the Center for TMS at the VASDHS for Veterans to receive clinical TMS treatments for their chronic headache and pain conditions. In addition, we are working with the Headache Center of Excellence (HCOE) program to make the treatment available at other VA facilities. Clinical trials are currently underway to assess the long-term treatment effect and treatment site specificity for posttraumatic brain injury and Gulf War illness-related headache and body pain.



Dr. Albert Leung

VA



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VA Research Highlight

Sensory Feedback and Naturalistic Control of Prosthetic Devices for Veterans with Limb Loss

Louis Stokes Cleveland VA Medical Center

Why this research is important:

Veterans who have lost an upper limb in service of country have lost both hand function and the sense of touch. These are the primary sources of physical, manipulative, and emotional connection to the world, and their loss results in lifelong functional and social deficits. Despite improvement in the functional and hand-like appearance in modern prosthetic devices, the lack of sensation and naturalistic control limits their functional capability, does not help users feel whole, and maintains social and psychological barriers to users' ability to connect with loved ones.

Summary:

To restore the emotional and functional aspects of the hand to a Veteran, we have developed an implanted system of nerve electrodes to restore touch and sense of movement, along with intramuscular electrodes to provide intuitive, long-term, stable control of prostheses with the look and functions of a human hand. We have successfully deployed these electrode interfaces in four subjects for more than six years without significant adverse events. Several case-series studies in-lab demonstrate multiple important aspects of sensory restoration and prosthesis control. A five-week, in-home case series demonstrated significant functional, integration, social, and quality-of-life advantages to restoring sensation.

How the research will improve Veterans' lives:

These subjects can feel their entire hand, distinguish between different objects, and even feel themselves picking up a child without fear of squeezing too hard. With this technology, Veterans feel like they have their hand again, reconnect with the world and loved ones, have an improved outlook and quality of life, and feel whole again.



Dr. Dustin J. Tyler



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Restoring Natural Sensation to Lower Limb Amputees

Louis Stokes Cleveland VA Medical Center

Why this research is important:

No lower-limb prosthesis offers a permanent and reliable method to restore natural sensation of the missing foot and joints for the 2.1 million people—including 1,600 military members—living with limb loss in the United States today. This sensory feedback could play an important role in reducing risk for trips and falls, improving ability to negotiate uneven terrain, and helping with gait symmetry and balance.

Summary:

The purpose of this study is to determine the feasibility of providing natural sensation of foot-floor contact and loading to people with lower-limb amputation. Small electrical currents delivered to the peripheral nerves remaining in the residual limb via implanted nerve-cuff electrodes are interpreted by the brain as sensations originating from the missing limb. The impact of electrically elicited sensation on standing balance, gait symmetry and stability, fall risk, ability to negotiate changing surfaces, confidence, and cognitive attention are being determined.

How the research will improve Veterans' lives:

Initial results indicate that sensations of various modalities (e.g., touch, pressure, movement) can be elicited at discrete locations referencing the missing toes, foot, and ankle. One volunteer who lost his limb during the Vietnam War experienced sensation in his missing foot with neural stimulation 48 years after amputation. Our goal is to develop the next generation of prosthetic devices that are integrated into the nervous system to provide the natural sensations required to improve standing and walking stability and allow users to safely participate in unstructured community environments.



Dr. Ron Triolo



U.S. Department of Veterans Affairs

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VA Research Highlight

Prevent Blindness: Technology-based Eye Care Services and Automated Computer-Assisted Image Interpretation

Atlanta VA Health Care System, with sites at multiple VA facilities across the country

Why this research is important:

Vision is critically important to quality of life, and Technology-based Eye Care Services (TECS) provides better eye care access for Veterans. This collaboration with Google allows for reader accuracy, efficiency, and care consistency in a comprehensive eye telemedicine program.

Summary:

Veterans are at high risk for potentially blinding disease. They face many challenges and barriers to obtaining eye care and are often diagnosed in later stages. TECS, a comprehensive tele-eye screening program, allows for specialty eye-care services to be delivered through the Veteran's primary medical care home. The program has been operational across the country as an established Office of Connected Care Telehealth program since 2015. It reduces health care disparities because the program targets vulnerable Veterans: homeless, rural, and highly rural patients. High-quality eye exam screenings are transmitted to a doctor who reads the images to make patient-care decisions. TECS generates a large photo/data interpretation burden daily for eye providers. Having a robust computer-assisted program that can process clinical data and detect multiple diseases on the same image would improve tele-eye services. Since 2016, the Atlanta VA Health Care System has been collaborating with Google to develop a computer algorithm to assist readers with this image interpretation.

How the research will improve Veterans' lives:

TECS allows VA to more effectively deliver eye care to any Veteran, no matter where they live. Computer-assisted image interpretation helps eye providers focus their attention on the patients who are highest risk. The program prevents blindness in Veterans.



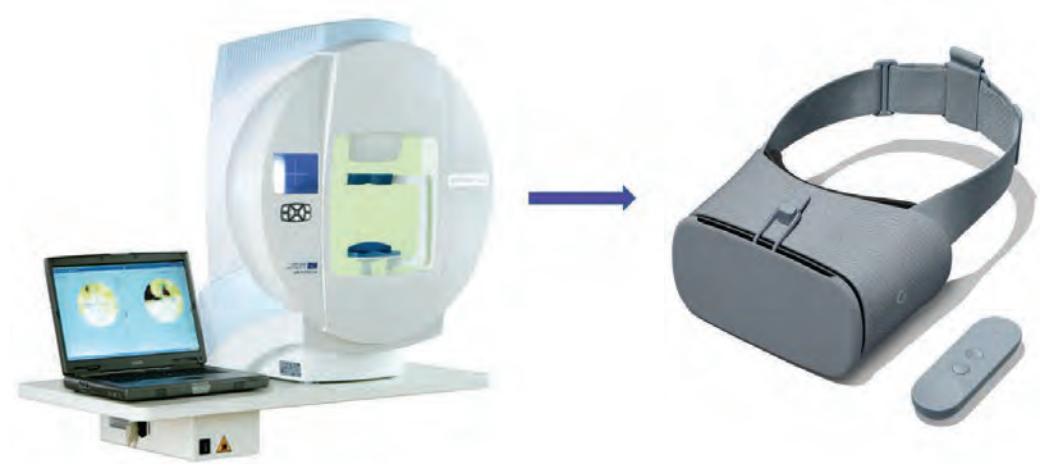
Dr. April Maa



U.S. Department of Veterans Affairs

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Visual Field Testing with a Virtual Reality Headset: Perimetry Made Portable and Inexpensive



VA Center for the Prevention and Treatment of Vision Loss, Iowa City, Iowa

Why this research is important:

Glaucoma is the leading cause of irreversible blindness in the United States and the world. Detecting glaucoma early is vital to preventing progressive visual loss and blindness.

Summary:

Visual field testing is usually done on a large expensive machine called a perimeter. Investigators at the VA research center in Iowa have developed a portable vision test for Veterans that provides similar information as an expensive perimeter using only a smart device and a virtual reality (VR) headset. This device is affordable at \$100, which is 0.3% of the cost of traditional equipment. Because it is portable, it can be used in telemedicine. Testing can be done in VA eye clinic waiting rooms, in outreach clinics, at a patient's residence, and in third world countries. This will allow for screening for blinding diseases such as glaucoma.

How the research will improve Veterans' lives:

The device will improve Veterans' lives by making visual testing and monitoring more available to Veterans in many venues, including waiting rooms, outreach clinics, and patient's homes.



Dr. Michael Wall



U.S. Department of Veterans Affairs

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Preventing Vision Loss in Diabetes by Early Detection Using Non-invasive Functional Testing

Atlanta VA Health Care System

Why this research is important:

Diabetic retinopathy is a leading cause of blindness in middle-age adults. Currently, clinical methods to detect diabetic retinopathy identify retinal vascular defects that occur during late stages of the disease.

Summary:

Retinal function can be measured non-invasively using the electroretinogram (ERG), which records the retina's response to flashes of light. Using diabetic animal models, we discovered that dim flash stimuli reveal an early delay in the ERG wave before vascular defects develop. To translate these findings to humans, we tested non-diabetic and diabetic Veterans with no signs of retinopathy using a hand-held, non-invasive ERG device with dim flash stimuli. We detected significant delays in the ERG waves in patients with diabetes prior to detectable vascular defects in the clinic.

How the research will improve Veterans' lives:

This early defect in retinal function could be used as a screening test for diabetic retinopathy. Earlier detection of retinal changes means that we could start treatments to prevent vision loss before diabetic retinopathy is diagnosed in the clinic. Early detection and treatment are particularly important to Veterans since 20% of Veterans have diabetes (twice the rate found in the general population).



Dr. Machelie Pardue



U.S. Department of Veterans Affairs

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Restoration of Cough in Veterans with Spinal Cord Injury



Louis Stokes Cleveland VA Medical Center

Why this research is important:

Veterans with spinal cord injury (SCI) who lack an effective cough may experience significant physical discomfort, including difficulty clearing secretions, the sensation of choking, and medical complications including a higher risk of aspiration and the development of respiratory tract infections. Moreover, respiratory infection is a major cause of death in this patient population. In fact, patients with SCI are ~150 times more likely to die from pneumonia than the general population.

Summary:

The purpose of this research is to test, in an animal model, a novel method to restore expiratory muscle function. The goal is to safely generate large positive airway pressures and high peak expiratory airflow rates in the same range as a normal cough. If successful, this method will be applied in clinical trials with human participants and may significantly facilitate the management of respiratory secretions, reduce the incidence of respiratory tract infections, and ultimately reduce the morbidity and mortality in SCI patient populations.

How the research will improve Veterans' lives:

This method has the potential to reduce the incidence of respiratory tract infections, reduce the need for caregiver support, improve quality of life, and significantly reduce the overall costs of respiratory management in Veterans with SCI.



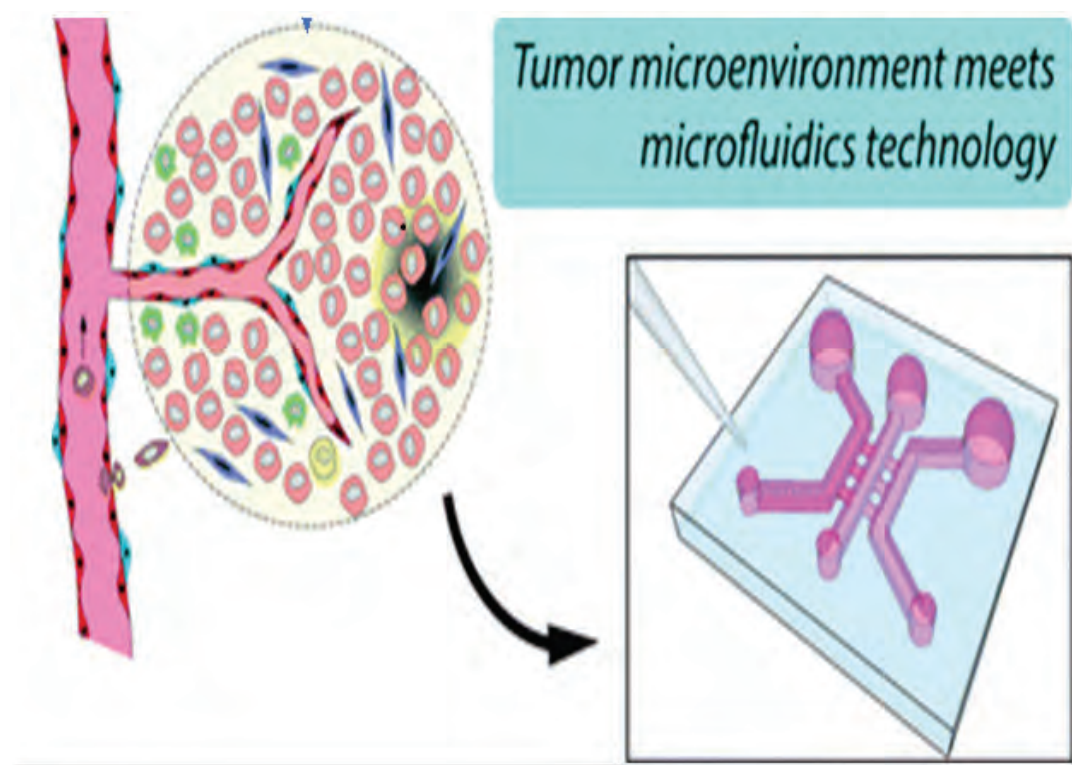
Dr. Krzysztof E. Kowalski



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A Tumoroid-on-Chip (t-CHIP) Platform: The New Frontier in Precision Oncology and Individualized Treatment (POINT)



James A. Haley Veterans' Hospital; VA Cell-Genomic Colorectal Cancer Collaborative

Why this research is important:

Cancer is a highly personal disease, as no two patients' cancers are alike. Given this, transitioning from "one-size-fits-all" to "precision oncology"—readily prescribing the right drug for the right patient at the right time—is urgently needed. Current tumor testing methods provide inadequate information to guide clinicians toward truly individualized cancer treatment.

Summary:

Current genetic testing to personalize cancer treatment is limited. It is analytically complex, involving hundreds of cancer genes and mutations, and does not account for the effect of the tumor microenvironment on gene function. To overcome these drawbacks, we have developed a tumoroid-on-chip (t-CHIP) platform. Using a biopsy sample, the t-CHIP generates a tumor-like mass called a tumoroid, which serves as an "avatar" of a patient's tumor outside the body. Tumoroids can be treated with various chemotherapy drugs, and the t-CHIP collects real-time data on the drugs' effects on tumor growth, physiology, and metabolism. This evaluation of an individual patient's tumor provides evidence of which drug is most effective. We are currently testing the platform in a clinical trial through a nationwide VA collaborative using colorectal cancer as a model.

How the research will improve Veterans' lives:

Almost 1 in 10 Veterans has colorectal cancer, and the incidence of colorectal and other cancers among Veterans is likely to increase as the Veteran population grows and ages. The t-CHIP is arguably a first-of-its-kind platform for POINT. Clinical testing of this platform is expected to lead to key advances toward effective treatment of colorectal and other cancers in Veterans and other Americans.



Dr. Shayam Mohapatra



U.S. Department of Veterans Affairs

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VA Research Highlight

Precision Oncology and Individualized Treatment (POINT): A Total Cancer Immunotherapy Platform

James A. Haley Veterans' Hospital; VA Cell-Genomic Colorectal Cancer Collaborative

Why this research is important:

Tumors are very complex and comprise a variety of immune cells and non-immune cells, including two types of culprit cells: cancer cells and cancer stem cells (CSCs). CSCs are the “cancer seeds” of tumors, playing a key role in processes such as tumor initiation, treatment resistance, and recurrence. Current cancer drugs—including immunotherapy—mostly kill cancer cells, not CSCs. There is an urgent need to develop a total cancer therapy (TCRx) approach that kills both. However, the small number of CSCs found within tumors is a major barrier to research on effective treatments targeting these cells.

Summary:

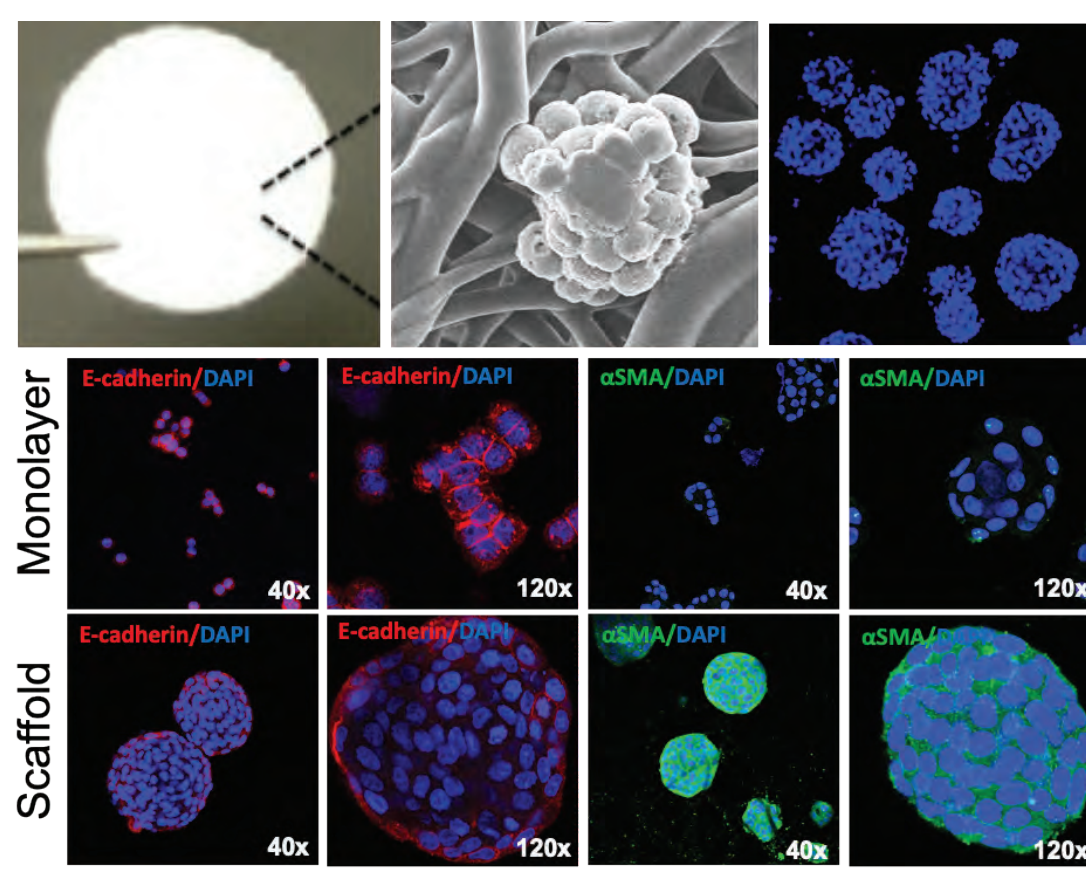
We developed a 4D tumor culture technology using scaffolds composed of polymeric nanofibers. Tumor cells from patient biopsy grow on this scaffold into tumor-like structures called tumoroids, which closely resemble tumors in the patient's body. The tumoroids expand the CSCs outside the body and can be treated with a variety of drugs to evaluate which treatments are most effective at killing CSCs. This platform allowed identification of several FDA-approved drugs, including mithramycin, that kill CSCs. Current research focuses on combining mithramycin with traditional immunotherapy drugs to develop a total TCRx platform. Our preclinical studies showed that combination therapy of mithramycin and an immunotherapy agent significantly increased the latter's therapeutic efficacy. This platform is currently being tested in a clinical trial through a nationwide VA collaborative using colorectal cancer as a model.

How the research will improve Veterans' lives:

The TCRx technology is arguably a first-of-its-kind platform for POINT. This platform could lead to key advances in patient-tailored treatment of colorectal and other cancers in Veterans and others.



Dr. Subhra Mohapatra



U.S. Department of Veterans Affairs
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VA Research Highlight

Women Veterans' Experiences with Harassment at VA



VA-wide

Why this research is important:

Public harassment is the experience of unwanted and intrusive attention that occurs in public places, and is also called sexual, street, or stranger harassment. It includes a range of verbal and non-verbal behaviors such as comments, catcalls, and staring, as well as noises and gestures. Public harassment is common and associated with negative mental and physiological effects. It may trigger mental health symptoms, particularly in women with a history of prior sexual trauma.

Summary:

Recent research found that one in four women Veterans face inappropriate or unwanted comments or behaviors by male Veterans when they come to VA for care. Most harassment (61%) involved catcalls, stares, and/or sexual or derogatory comments. Another 16% involved male Veterans questioning or denigrating women's Veteran status or their right to access VA care, while 5% reported stalking, threats, or unwanted physical contact. Women Veterans who reported harassment were less likely to feel welcome at VA, more likely to feel unsafe at VA, and more likely to delay or miss care. In response, VA launched a national campaign to disseminate anti-harassment posters and staff training to every VA. Many VAs have also developed local innovations, such as female volunteers to walk women Veterans to their appointments.

How the research will improve Veterans' lives:

This research has already begun improving Veterans' lives through improved national awareness and VA policy action. The VA Women's Health Research Network is tracking progress (89% of women Veterans report feeling safe at VA, 57% can tell VA is working to address harassment) and has launched a new initiative to accelerate local culture change initiatives. New research is engaging national experts to develop evidence-based strategies to end gender-based harassment.



Dr. Becky Yano



U.S. Department of Veterans Affairs

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VA Research Highlight

Implementing Caring Contacts for Suicide Prevention in Non-Mental Health Settings

Central Arkansas Veterans Healthcare System

Why this research is important:

This project is important because not all Veterans who experience suicidal ideation or suicidal behavior have mental health diagnoses or engage in mental health services. Focusing on non-mental health settings such as the emergency department broadens the scope of suicide prevention and allows reach to a greater proportion of Veterans served.

Summary:

Caring Contacts is a simple and effective suicide prevention intervention that involves sending patients who have been suicidal brief, non-demanding expressions of care and concern at specified intervals over a year or more. It has been shown to reduce thoughts of suicide, suicide attempts, and death by suicide. This project is adapting Caring Contacts for VA emergency department settings and piloting implementation in preparation for spread across multiple VA facilities.

How the research will improve Veterans' lives:

This work will improve Veterans' lives by increasing a sense of connection with others and reducing suicide-related behavior. Veterans have provided feedback about the project, and most think Caring Contacts will help other Veterans who might be suicidal.



Dr. Sara J. Landes

Dear Mr. Smith,
It was an honor to serve you in the emergency department.
We are here if you need us. Should you need anything, please contact us.

Lori Davis, RN and Your Emergency Department Team
501-257-5683



Central Arkansas Veterans Healthcare System | 4300 W 7th St, 116 NLR CC | Little Rock, AR 72205



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VA Research Highlight

Using Electronic Health Records to Identify and Reduce Delays in Diagnosis

Collaboration of 12 VA facilities led by the Center for Innovations in Quality, Effectiveness and Safety (IQuEST) based at the Michael E. DeBakey VA Medical Center, partnered with the VA National Center for Patient Safety

Why this research is important:

Failure to follow-up patients' abnormal test results ("missed test results") is a key preventable factor in diagnosis and treatment delays in VA.

Summary:

This project aims to use a collaborative approach to develop and evaluate multifaceted "sociotechnical" tools and strategies to help reduce missed test results in VA. We previously developed and tested a novel electronic health record-based indicator system called "e-trigger" that uses semi-automated methods to identify patients with potential delays in cancer diagnosis. These e-triggers alert clinicians to review records to identify and act upon care delays more efficiently. In addition to implementing e-triggers, we will create and implement process improvement strategies and best practices to make follow-up of test results more reliable.

How the research will improve Veterans' lives:

Delays in cancer diagnosis are harmful to patients and often are related to lack of timely follow-up of abnormal test results. For instance, a delayed action on an abnormal chest X-ray or a mammogram could lead to delays in cancer diagnosis and/or curative treatment and thus impact patient survival. This research aims to reduce communication failures that lead to missed or delayed diagnoses and improve patient safety related to test result follow-up. In addition to a better measurement system using e-triggers, it will also lead to better processes, tools, and guidance to improve clinical practice in VA and private sector outpatient care.



Dr. Hardeep Singh



U.S. Department of Veterans Affairs

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Increased Opioid Risks when Veterans Receive Care Through Both VA and Medicare

Pittsburgh VA Healthcare System

Why this research is important:

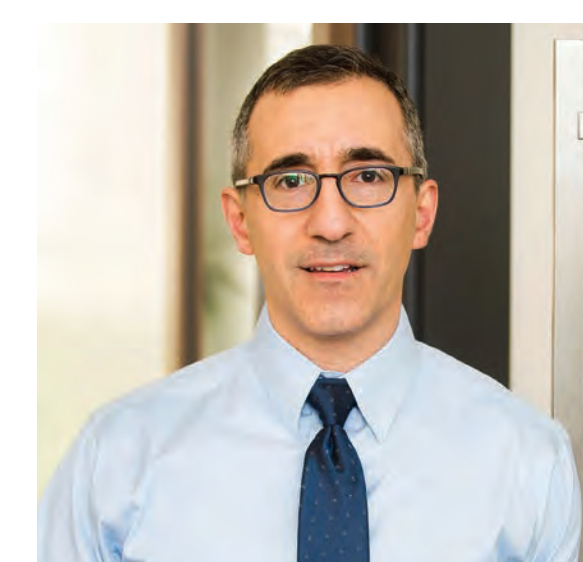
More than half of VA patients have chronic pain, and many receive opioid medications. VA has several initiatives in place to monitor prescription opioids and related medications to ensure their safe use, but these efforts focus almost entirely on monitoring prescriptions dispensed within VA. However, more than 75% of Veterans have other forms of health insurance and can access prescriptions, including opioids, in non-VA settings, including through Medicare. It is crucial to understand the impact on opioid safety of receiving opioid medications from multiple systems.

Summary:

We studied the impact of dual use of VA and Medicare prescription benefits on opioid safety for Veterans. In a national cohort of a half-million Veterans, 71,146 (13%) received opioid prescriptions from both VA and Medicare, including 23,107 (32%) who had at least 30 days of overlapping opioid prescriptions. Dual use was associated with three times the risk of high-dose opioid exposure and twice the risk of exposure lasting more than 90 days, compared with VA-only use. Dual-use Veterans had a 27% higher risk of receiving overlapping opioid and benzodiazepine prescriptions (an unsafe combination) than VA-only Veterans. Finally, the risk of death from prescription opioid overdose was three times higher in dual-use Veterans, compared with Veterans using only VA.

How the research will improve Veterans' lives:

Our findings highlight the need for coordination of care across VA and non-VA health systems. This research catalyzed a data-sharing agreement between VA and Medicare. This landmark agreement gives VA the ability to monitor medical prescriptions issued outside VA through Medicare Part D on a national scale, which will directly impact care coordination and improve opioid safety for Veterans.



Dr. Walid Gellad



U.S. Department of Veterans Affairs

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Implementing a Behavioral Health Model in VA: Testing, Scale-Up, and Spread

30 VA medical centers across the country

Why this research is important:

Many controlled trials show that mental health clinician teams organized around the Collaborative Chronic Care Model (CCM) improve outcome. But can these CCM teams be implemented in real-world clinical practice in VA?

Summary:

Working with the VA Office of Mental Health and Suicide Prevention (OMHSP), we used evidence-based implementation strategies to align care in existing Behavioral Health Interdisciplinary Program teams with CCM principles across nine VA medical centers. Provider team function improved significantly, including role clarity and prioritization of team goals ahead of individual goals. Hospitalization rates decreased for team-treated Veterans, and mental health status improved for Veterans with three or more behavioral health conditions. Partnering with OMHSP and the Office of Veterans Access to Care, we then implemented the model in 21 additional VA medical centers.

How the research will improve Veterans' lives:

Implementing CCM teams prevents hospitalizations and improves mental health status, particularly for Veterans with complex behavioral health problems. CCM teams bring together providers to coordinate and integrate care for Veterans.



Dr. Mark S. Bauer

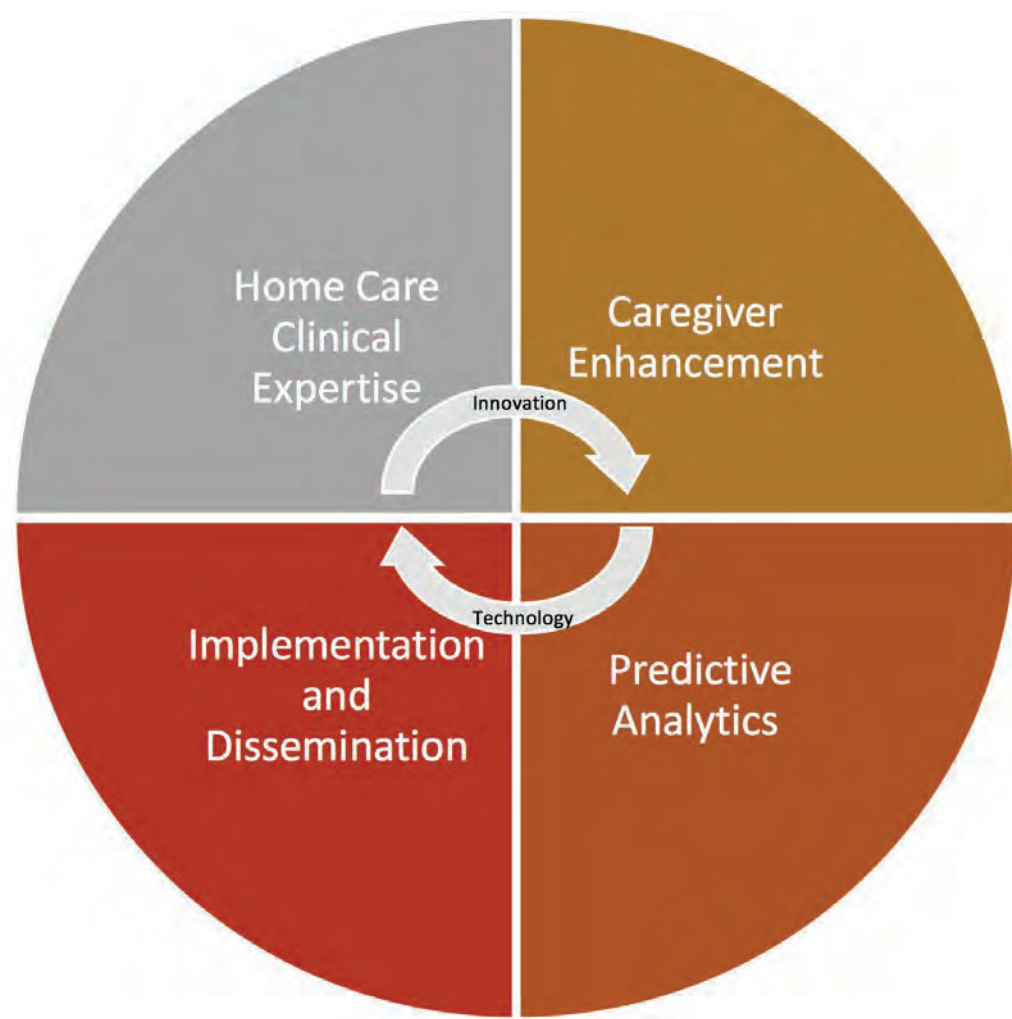


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VA Research Highlight

The Elizabeth Dole Center of Excellence for Veteran and Caregiver Research



Audie L. Murphy VA Medical Center, San Antonio, Texas; Salt Lake City VA Medical Center; Miami VA Medical Center; Palo Alto VA Medical Center; Canandaigua VA Medical Center

Why this research is important:

Our research will expand VA's capacity to deliver innovative, data-driven, integrated approaches to enhance the health of Veterans and better support their caregivers.

Summary:

The Elizabeth Dole CoE comprises an interdisciplinary team of investigators collaborating to implement best practices in allowing Veterans to stay in their homes and communities with assistance from the caregivers who support them. The team will complete the following work:

1. **Pilot four innovative interventions**, assessing feasibility and impact
 - Caregiver training program
 - Resource guide for home/community resources
 - Refined care model for high-need/high-risk Veterans
 - Functional status incorporation into Decision Support

Pilots were chosen based on the scientific literature and clinical experience of the multi-disciplinary providers and researchers involved in the CoE.

2. **Identify stakeholder-driven outcomes**, which will be used across all pilots
3. **Determine optimal combinations** of services for different Veteran populations
4. **Integrate findings for dissemination** across VA

Veterans and caregivers are involved in all aspects of this work.

How the research will improve Veterans' lives:

Our findings will allow VA to provide services that best meet the needs of Veterans and their caregivers. It will also allow VA to assess Veterans' and caregivers' health and experiences using approaches that best reflect the preferences of those groups.



Dr. Luci Leykum



U.S. Department of Veterans Affairs

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Microfluidic Artificial Lungs

VA Ann Arbor Healthcare System

Why this research is important:

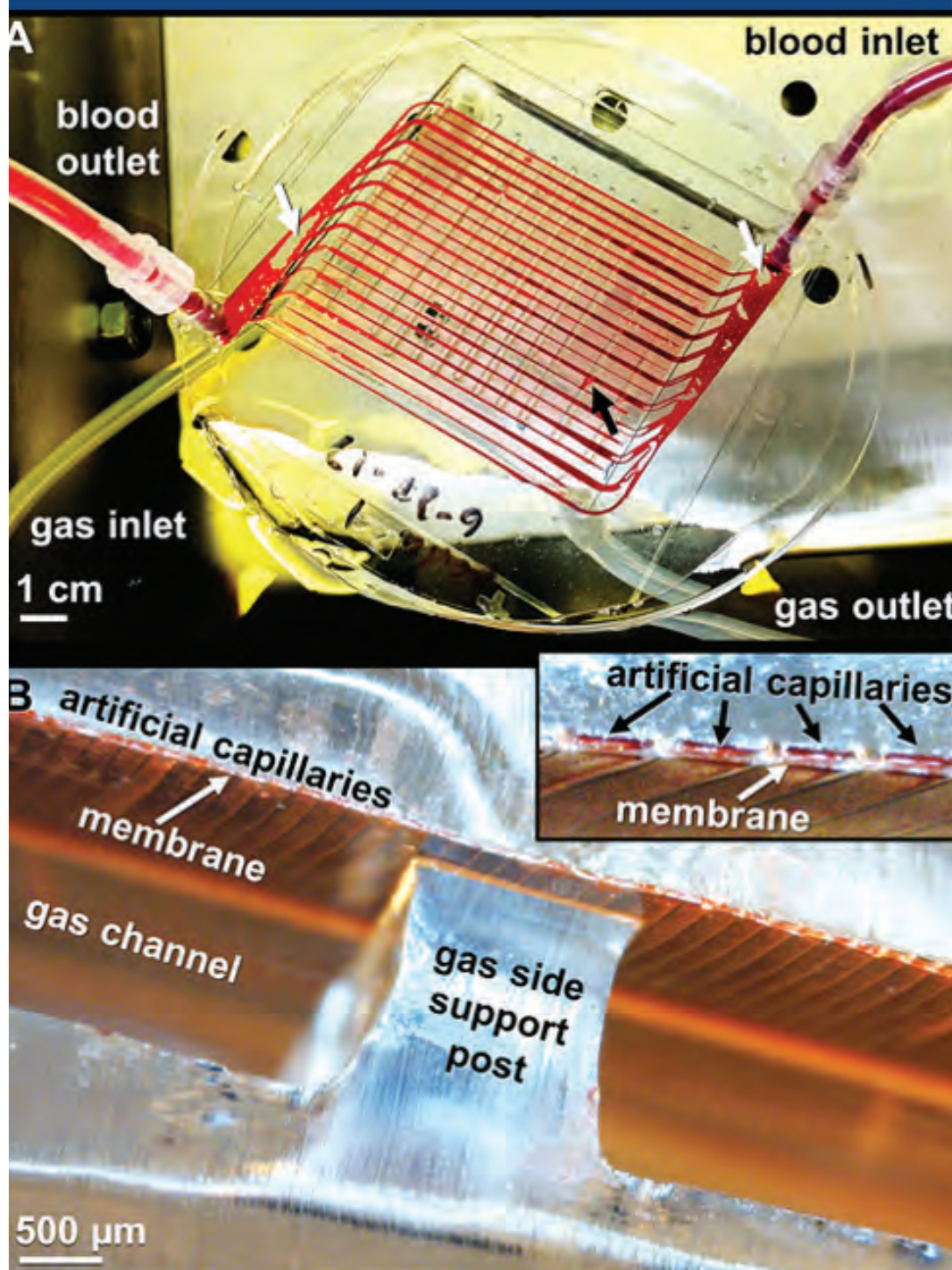
Currently, the only definitive treatment for end-stage lung disease is lung transplant. However, more patients are in need of a transplant than there are available donor lungs, and many patients are not eligible for transplant. The success of this technology could provide a treatment alternative to lung transplant in the form of long-term wearable or implanted artificial lungs.

Summary:

Using microfluidic technology, we designed artificial lungs that mimic the circulation through the natural lung. The resulting devices are significantly more efficient than current clinical artificial lungs, and are expected to be more biocompatible as well. The focuses of this project include device design, development of new manufacturing methods, performance testing (gas exchange and biocompatibility), and implementation of automated control systems.

How the research will improve Veterans' lives:

Chronic lung disease affects 16% of VA health care users, and severely impacts their quality of life. As lung disease progresses, even the simplest daily tasks become exhausting. Microfluidic artificial lungs can be used as a bridge to recovery (in cases of acute lung injury) or transplant, but the long-term goal is for this technology to become a destination therapy, providing an alternative to transplant and greatly improving the quality of life for Veterans with chronic obstructive pulmonary disease.



Dr. Alex Thompson



Dr. Joseph Potkay

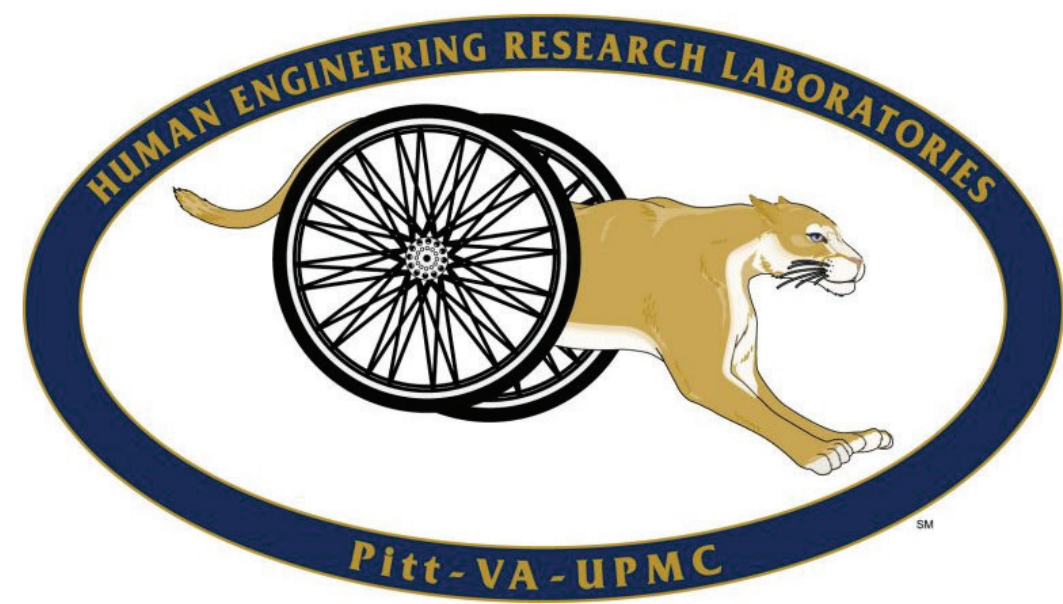


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VA Technology Transfer Assistance Project (TTAP)

Human Engineering Research Laboratories, Pittsburgh, PA



Why this research is important:

TTAP supports VA's Technology Transfer Program in the commercialization of VA inventions to benefit Veterans and the American public. TTAP, in partnership with HERL, takes early prototype inventions and further develops them in collaboration with the inventors to prepare for patenting and licensing.

Projects:

(a) PROSTHETIC HOOK MOUSE—A modified computer mouse for use by individuals with an upper-limb hook-type prosthetic. Permits easier movement of the computer mouse and clicking in the desired position on the computer screen. (Rory Cooper, Garrett Grindle, Zachary Anzelone, Aaron Anderson; Pittsburgh, PA)

(b) OXYGEN BURN-BACK VALVE COVER—A thermal fuse cover that reduces the risk of a fire in/around an oxygen gas line. (Douglas Hilliard; Butler, PA)

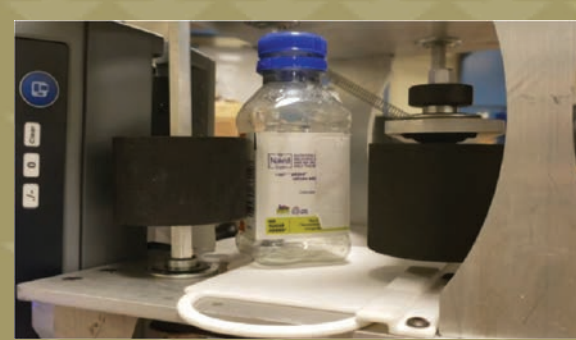
(c) PRESCRIPTION LABELER—A device that attaches labels to pharmaceutical vials, bottles, boxes, etc. The device labels containers faster than a human can, thereby increasing efficiency within the hospital pharmacy. (Raymond Herard; Charleston, SC)

(d) CORD CADDY—A device that prevents tangling of a patient's multiple IV lines. The sterile device can be used during surgery as well as in other phases of a patient's hospital stay. (Kristin Chrouser, Steve Morin; Ann Arbor, MI; Minneapolis, MN)

(e) STERI-TIP CATHETER—A catheter with a sterile tip that keeps the tip of a scope protected while going into an individual's lungs. This allows the ability to get a good sample for diagnosing pneumonia. (Gianfranco Meduri; Memphis, TN)

(f) HEATED PULSE OX—A pulse oximeter that heats the measurement site. Warming the measurement site improves blood flow and thus provides a more accurate reading. (Catherine Abee; Pittsburgh, PA)

(g) HAND-PEDAL—A hand-powered pedal for people with lower-limb amputation. It can be used with equipment such as a bicycle to promote healthy use of the arm muscles. (Rory Cooper, Benjamin Gebrosky; Pittsburgh, PA)



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Soft Suicide Prevention Door



Sheridan VA Health Care System

Why this research is important:

Although inpatient suicide attempts or completions are rare, hanging is the most common method. Doors, especially interior doors such as to a bathroom, are the most common anchor points. With the invention of the Soft Suicide Prevention Door, we have been able to allow Veterans to retain dignity in a safe manner.

Summary:

The story of the door started back in 2007–2008, when suicide became a hot topic within VA. Hospitals were required to make acute psychiatric units as safe as possible and prevent all potential anchor points. The director of our facility challenged me to find a way to eliminate bathroom doors but maintain privacy. I went to the local hardware store and started purchasing supplies. I built a door in my driveway but had no ideas for the core, so a fellow coworker remembered a delivery arriving in foam and suggested we try that. Next, we visited a local business to see if they could sew the door for us. Once we were off and running, we contacted the VA's Technology Transfer Program, who recognized the value of the door and knew it would make a difference. We have continued upgrading the door—for example moving from Velcro to magnets—so that we could have a great product that saves lives.

How the research will improve Veterans' lives:

The product improves the lives of Veterans while they are in our facilities because they can have some privacy while still being safe. The photo images on the doors brighten up rooms of units that can't have much in the way of decorations. The doors have also been used in other ways, such as lowering Veterans to the floor and protecting staff and Veterans during disruptive incidents.



Lisa Garstad



U.S. Department of Veterans Affairs

Veterans Health Administration
Office of Research & Development

VA Research Highlight

Million Veteran Program



MVP

63 VA medical centers nationwide

Why this research is important:

The Million Veteran Program (MVP) will help answer questions about why certain treatments work for some Veterans and not others as well as why some people are at greater risk for certain diseases due to their genetics. With the largest integrated health and genomic database tied to a health care system in the world, researchers can compare the genetic and health information from many thousands of people to better understand the diverse spectrum of human health to improve health care outcomes.

Summary:

The Million Veteran Program is the world's largest genomic cohort of its kind and has the largest representation of minorities of any genomic cohort in the U.S. Research findings based on MVP data may lead to new ways of preventing and treating illnesses in Veterans and others. As of May 2019, over 750,000 Veterans had enrolled. The program partners with Veterans who volunteer to share their health information and genetic material. These Veteran partners fill out surveys about their health and health-related behaviors; provide a single sample of blood that is analyzed and stored for future research; and allow secure access to VA and VA-linked medical and health information, including past and future health records. Approved researchers access and analyze data in a central, secure computing environment. With this vast and diverse data set, researchers are able to evaluate how genes interact with lifestyle factors and environmental exposures to influence the risk for common illnesses such as heart disease, diabetes, and cancer.

Over 30 scientific projects are currently underway studying PTSD, heart disease, Gulf War illness, diabetes, cancer, eye disease, tinnitus, addiction, and chronic kidney disease, among other topics. MVP-based studies have already uncovered new genetic variants associated with re-experiencing symptoms in PTSD, heart disease, and kidney disease. These findings have been published in high-impact scientific journals, and some of the results may lead to potential new treatments for heart disease and diabetes. (One example is highlighted in the companion MVP poster.)

How the research will improve Veterans' lives:

Veterans stand to benefit greatly as researchers learn more about the effects of genes on health. Screening, diagnosis, and treatment for some illnesses have already been improved through knowledge about the effects of certain genes. MVP will lead to new knowledge about which genes put people at risk for certain diseases, and which ones affect how people respond to treatment.



Dr. Suma Muralidhar

VA



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VA Research Highlight

Genetics of blood lipids among ~300,000 multiethnic participants of the Million Veteran Program

Million Veteran Program

Why this research is important:

Cardiovascular disease (CVD) is a common problem among U.S. Veterans. One of the biggest risk factors is abnormal lipid levels (cholesterol and triglycerides) in the blood. Many factors combine to cause abnormal lipid levels, and genetics is one of these factors.

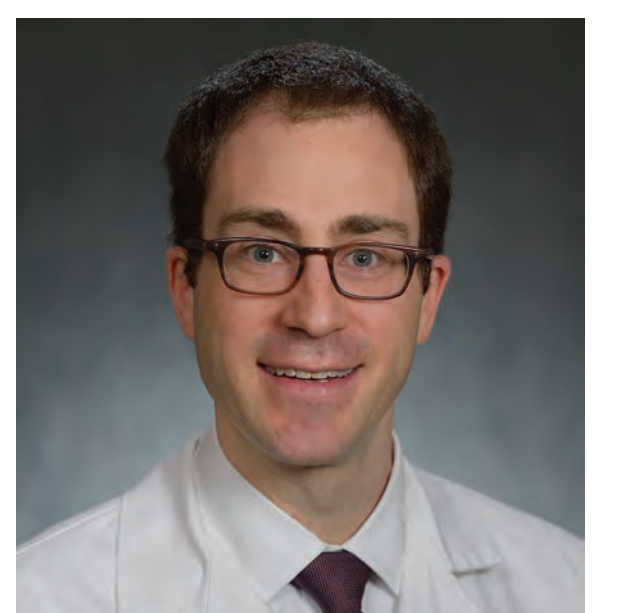
Summary:

A large group of VA researchers based out of Palo Alto, Philadelphia, Boston, and Atlanta used data from the Million Veteran Program to uncover genetic variants associated with lipid levels. The study used data from the medical records of approximately 300,000 U.S. Veterans, combined with genetic data obtained from blood samples taken when they enrolled in MVP, to (1) confirm known associations between genetic variants, and lipid levels and (2) discover new genetic variants that are associated with lipid levels. Because of the large sample size in MVP, the researchers could identify very rare genetic variants, as well as more common variants that have small impacts on lipid levels. The group confirmed 188 known variants from other studies and found 118 novel genetic variants that contribute to lipid level differences and cardiovascular disease.

Of particular interest, the researchers found variants that alter the function of three genes (PDE3B, PCSK9, and ANGPTL4). These could be potential therapeutic targets for diseases like CVD and diabetes.

How the research will improve Veterans' lives:

Cardiovascular disease is a complicated chronic disease that impacts many Veterans, and it has genetic components that are not fully understood. This research identified new areas of the genome that contribute to lipid levels. Knowledge of these areas could lead to potential new treatments for CVD and other diseases.



Dr. Scott Damrauer



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VA Research Highlight

The VA Central Institutional Review Board (CIRB) Panel Expansion Initiative

VA Central Office

Why this program change is important:

IRB review is a critical step in the approval process for certain categories of human subjects research. As VA prepares to engage in more precision oncology and precision medicine research trials, the CIRB is leveraging the existing infrastructure of VA to establish more panels of the CIRB at existing VA IRBs. The Miami VA IRB will be the first medical center to deploy a CIRB expansion panel. Increasing the panel numbers will give the CIRB increased opportunity to review studies, thereby reducing the time studies must wait to receive review.

Summary:

The VA CIRB started in 2007. The CIRB gives VA an unprecedented ability to conduct multisite trials across our 110 medical centers conducting human research. The VA CIRB currently oversees more than 239 multisite trials, each ranging in sites from 2 to 66 (average = 7). The types of studies reviewed range from behavioral health to FDA-regulated interventional trials involving both drugs and devices.

How the program change will improve Veterans' lives:

Being able to review and approve studies more rapidly will give Veterans access to more clinical trials at sites where there is capacity to take on more research work.



VA



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VA Electronic Determination Aid (VAEDA)

VA Central Office

Why this program change is important:

Over 10,000 new research project determinations are made each year within VA. These determinations evaluate what level of review is required for research involving human beings. Of the 10,000 determinations made, approximately 6,000 are made by institutional review board (IRB) chairs, who are usually physician providers receiving administrative support. On average, 1.5 hours are spent per determination. The resulting cost estimate is \$1.35 million in physician and administrative staff salary spent on these activities.

Summary:

Making and documenting research determinations are important aspects of the regulatory environment of an institution that conducts quality improvement and research. Research determinations first identify whether a project meets the definition of research. Within projects determined to meet the definition of research, determinations are needed to specify the categories of research not involving human subjects; human research that meets criteria for exemption from further human subjects regulatory review; human research that is exempt but requires limited IRB review; and research that must be reviewed by an IRB. This tool will help to standardize the process by which these determinations are made, thus increasing efficiency and freeing up provider staff to care for patients. Approximately 6,000 potential patient care hours per year can be returned to clinical support.

How the program change will improve Veterans' lives:

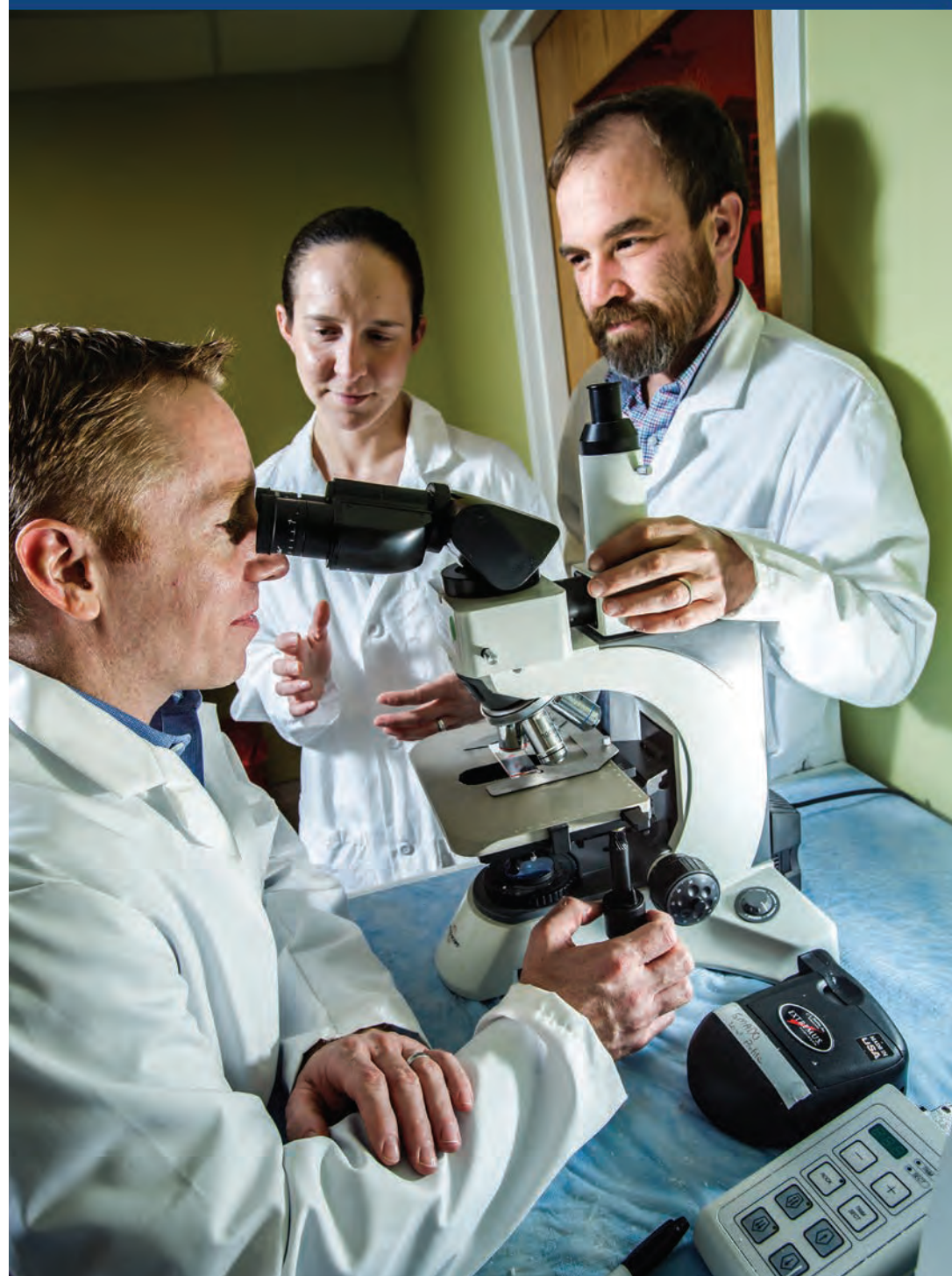
Freeing up providers from performing administrative reviews that can be accomplished by an online algorithm and administrative staff will not only improve the satisfaction of providers but will also increase availability of those same providers for clinical care for our Veterans.



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Clinical Trials / Cooperative Studies



Washington, DC (VACO)

Why this research is important:

Clinical trials can provide the highest levels of evidence to inform decisions by clinicians, patients and families, and policymakers. VA has a strong tradition in and extensive capability for doing high-quality clinical trials that benefit the health and well-being of Veterans and the nation.

Summary:

Overviews of VA's role, accomplishments and capabilities in doing impactful clinical trials will be provided. The audience will better understand why VA clinical trials play a critical role in the health of Veterans and general public. Discussions will also describe unique VA clinical trials and future directions.

How the research will improve Veterans' lives:

VA clinical trials have led to lifesaving findings and innovations that have improved health and quality of life for many people. These results have led to many commonly used clinical practices. VA clinical trials continue to produce high-quality evidence to inform the care of Veterans and others through its expertise and partnerships.



Dr. Grant Huang



U.S. Department of Veterans Affairs

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VA Research Highlight

VA National Precision Oncology Program



VA-wide

Why this research is important:

Approximately 50,000 Veterans are diagnosed and treated for cancer annually at VA, including 15,000+ with prostate cancer and about 9,000 with lung cancer. While VA has begun to build critical elements to drive precision oncology, significant investment is needed to create a system of excellence in which the best care is the standard.

Summary:

Precision oncology is the effort to improve patient outcomes by identifying the biologic drivers of an individual patient's cancer and administering treatments that inhibit the drivers. The VA National Precision Oncology Program (NPOP) will provide an innovative approach to cancer treatment. Treatments will be specifically designed to target the unique form of cancer through the analysis of the Veteran's genetics and the cancer's genetic mutation. NPOP will build a precision oncology network, with a hub located in each Veteran Integrated Service Network, to deliver care that meets or exceeds care provided by the nation's leading cancer centers.

The NPOP network will provide genomic testing and counseling, data analytics to drive care, tumor boards for challenging clinical concerns, enhanced clinical trials access, and national telehealth oncology. Prostate cancer and lung cancer are the primary focus for the program, with the intent to include other forms of cancer in the future.

How the research will improve Veterans' lives:

Creation of the NPOP will enable VA to provide next-generation cancer treatment to Veterans while supplying the industry with valuable data that can be leveraged for cancer treatment worldwide.

VA

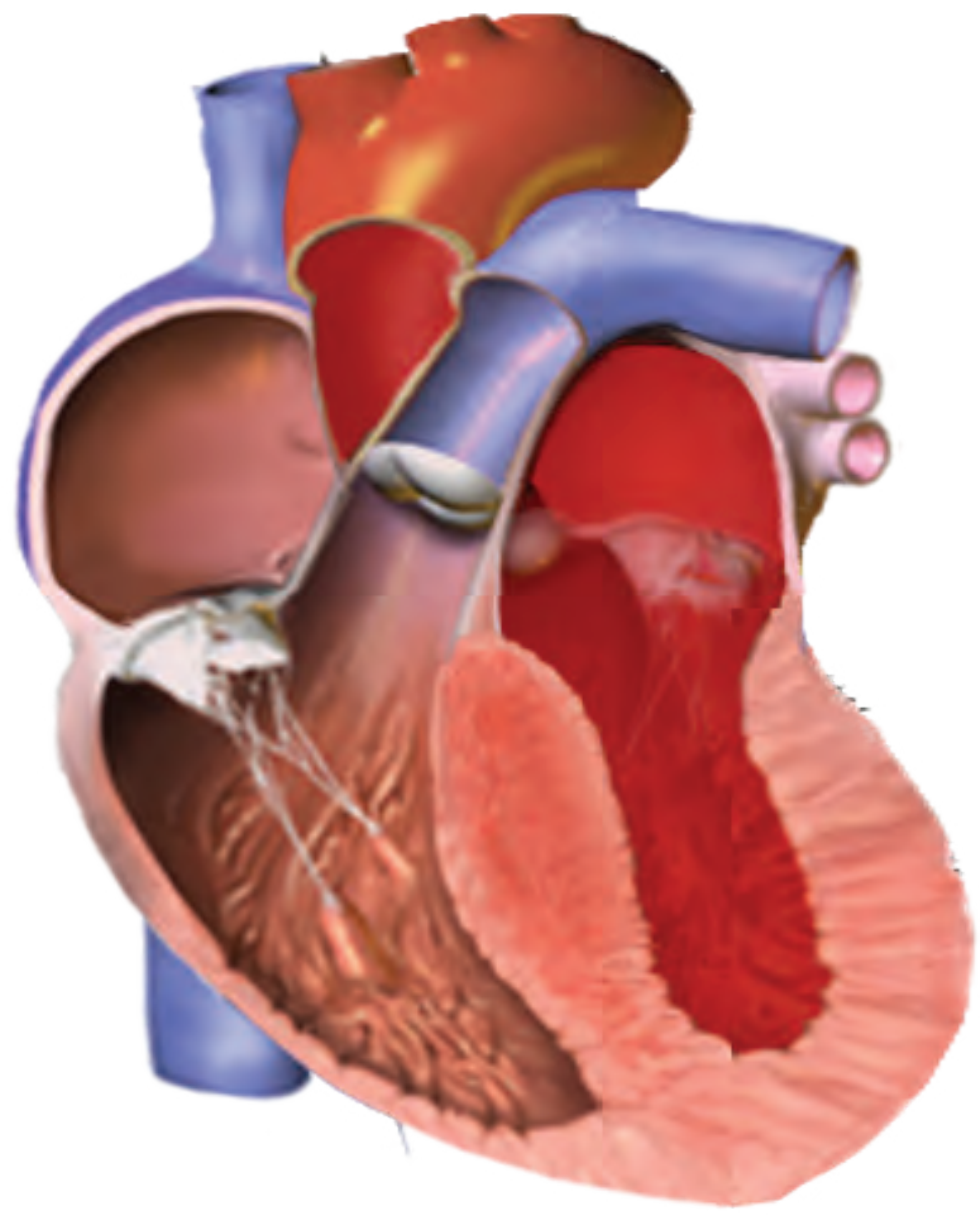


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VA Research Highlight

VA Research Funding Produces Scientific Advances that Save Lives and Reduce Disability in Veterans with Heart Failure



Ralph H. Johnson VA Medical Center

Why this research is important:

One of the largest unmet needs in Veteran health care is the ability to accurately diagnose and manage patients with chronic heart failure (CHF), particularly those with CHF caused by high blood pressure related to battlefield conditions. Veterans with CHF die at an alarming rate (50% in five years), need frequent hospitalization (almost twice a year), have severe disability, and have little or no effective treatment. We recognized this need as clinicians (at the bedside).

Summary:

We conducted experiments in the research laboratory (at the bench) that led to discovery of some of the cellular and molecular mechanisms that lead to CHF. We developed methods to identify these mechanisms in basic models of human disease (using blood-based biomarkers to detect scarring and fibrosis of the heart muscle) and then applied therapies that helped to correct these mechanisms. We translated these advances from models of human disease to Veterans with CHF and demonstrated (at the bedside) that these advances decreased death and disability in clinical studies. VA research funding, used synergistically with other federal and corporate funding, was pivotal to the discovery of underlying mechanisms in CHF (presence of fibrosis), novel diagnostic methods (biomarkers of fibrosis), and application of medications that lessen fibrosis and decrease morbidity and mortality.

How the research will improve Veterans' lives:

The newly identified cellular, extracellular, molecular, and myocardial mechanisms of CHF are providing targets for advances in diagnosis, prognosis, and management of heart failure in Veterans and other patients.



Dr. Michael R. Zile

VA



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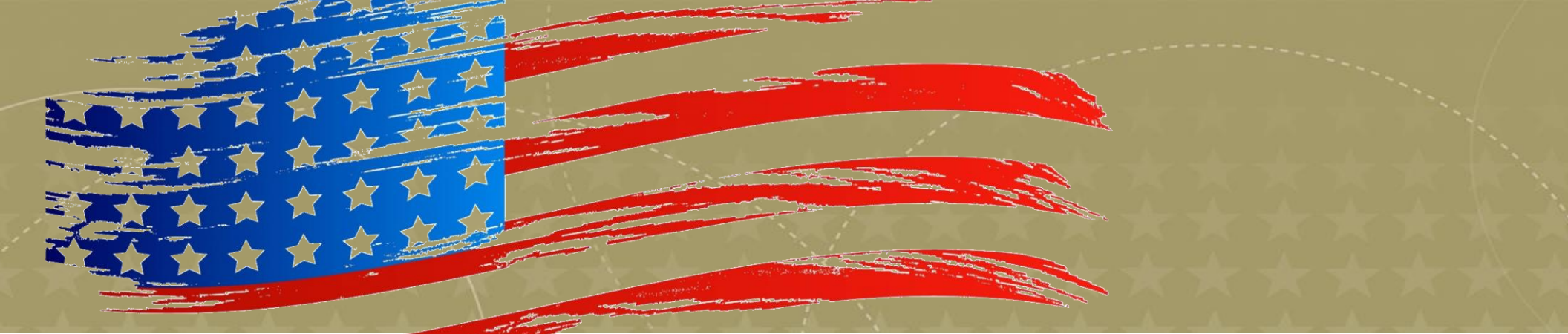
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VA Research Day On The Hill

Thursday, June 20, 2019
Rayburn House Office Building – FOYER





A Veteran's Experience with VA

FeiFei Chen is a combat Veteran who proudly served with the 43rd Brigade 118th Military Police Battalion during Operation Iraqi Freedom from 2003-2004. She supported the unit colonel as the paralegal specialist. She provided legal and administrative support and was responsible for transporting personal mail and care packages. Her primary duty was to ensure every gift arrived safe and sound across dangerous war zones.

Upon returning from deployment, she was clinically diagnosed with PTSD, ADHD, anxiety, severe depression, fibromyalgia, and a plethora of unexplained physical and mental misalignments. This propelled her into a decade of research and deep personal reflection in search of health recovery. She faced tremendous challenges in the process but found the support she needed at the Providence VA Medical Center.

FeiFei saw an ad for a Virtual Reality (VR) with Transcranial Direct Current Stimulation (tDCS) Research Study at the VA wellness center. Without hesitation, she signed up to participate. It wasn't easy for her to recall the traumatic experiences during the interviews. The initial VR simulation gave her a stomach ache and induced vomit due to the simulation of the exposure. But right away she knew the tDCS combined with VR simulation would help her. In her personal experience, the sessions delivered faster and better results than any of the healing modalities provided at VA she had tried, including cognitive psychotherapy, talk therapy, Reiki, acupuncture, physical therapy, and various medications. Her anxiety was gone and her longtime struggle with binge eating disorder ceased to exist.

Since then, FeiFei has become an advocate for the Virtual Reality (VR) with Transcranial Direct Current Stimulation (tDCS) program and encouraged all her Veteran friends to participate. One day in March of 2019, she gave a moving talk to physicians, staff, and administrative leaders at an annual gathering at the Providence VA. Sharing her personal story, she strongly recommended that all Veterans help to support and participate in the study because collaboration with VA is the best way to determine the care one needs. Evidence show that these cutting-edge technologies are proven to provide positive impact to complex health problems on a grand scale—everyone benefits, including Veterans' families and communities, and the nation as a whole.

FeiFei graduated from Bryant University with an undergraduate degree in economics and a minor in Business Administration. Her professional experience ranges from tech start-ups to Fortune 50 enterprises. Her PTSD symptoms, however, hinder her employment in a traditional environment. Today she is building an online business and working as a consulting specialist in e-commerce solutions and marketing strategies. In her free time, she volunteers at the Providence VA under guidance of the Chief Chaplain and practices meditations daily. FeiFei is passionate about giving back to the Veterans' and their community—she lives to transform herself and others.



FeiFei Chen

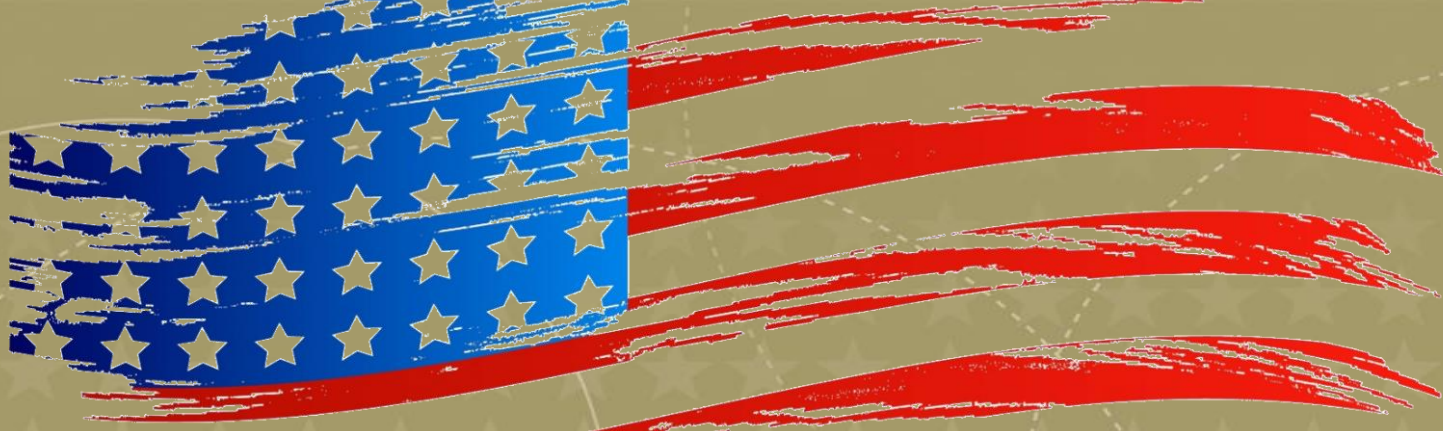
...VA is the best way to determine the care one needs...



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A Veteran's Experience with VA

Abriant Quintana served in U.S. Navy and was a part of Operation Iraqi Freedom. Abriant had also served in Afghanistan with a Joint Special Operation Command from January 2009 to December 2010. At the end of this tour he and his team endured an IED blast. Afterward, Abriant suffered from TBI and was subsequently (honorably) discharged from the Navy.

Abriant describes what brought him to VA Research: "After a treatment for pain management in my back, I found a flyer on a bulletin that outlined a new treatment for TBI patients. After being treated for TBI, the only solution that was available at the time was simply pharmaceutical. Therefore, when I was presented with an alternative method that could potentially help me, I was enticed to be a part of this TMS research.

After being a part of the TBI research program, Abriant's goal was to find a method to alleviate his headaches. "The TMS research program has positively impacted my life, inasmuch as introducing me to a noninvasive and non-pharmaceutical treatment that assisted in alleviated my headaches," he explains.

Abriant explains why he thinks participating in VA research is important, saying, "I would recommend participating in VA research to another Veteran. I highly recommend TMS to patients with TBI simply because I support the idea of reducing or eliminating the use of opioids. I strongly support medical instruments that can help a Veteran noninvasively and non-pharmaceutically. Therefore, I deem the VA research to be of paramount importance when considered the road that it paves for the future of Veteran's like myself."

Abriant Quintana

...I would recommend participating in VA research to another Veteran...



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A Veteran's Experience with VA

Keith Vonderhuevel served in the U.S. Army from 1984–1987. He lives in Sidney, Ohio, with his wife and children. He lost his right arm while working his civilian job in a manufacturing accident. He joined Dr. Tyler's study for sensory restoration in amputees in 2013. In the study, Keith was implanted with small cuffs around the nerves in his arm paired with pressure sensors on a prosthesis. This allows Keith to feel touch with his prosthetic hand. During Keith's participation in the study, he has been able to take the sensorized prosthesis home and around his community.

According to Keith, "Having the sensation of my hand impacts how I interact with my family, grandkids, and other people. Before, I was timid about it and now I am more confident holding hands, picking up my grandkids, and cooking and cleaning."

**Keith
Vonderhuevel**

*...I am more
confident in
holding
hands...*



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A Veteran's Experience with VA



(Photo)

Ben Hutchison

Ben Hutchison served in the U.S. navy as a small boat engineer, then worked as a manufacturing engineer after leaving the service. After he lost his arm and leg in a motorcycle accident, he was approached by his physician to participate in a research trial working to restore sensation in people with lower-limb amputation. In this study, Ben had small electrodes implanted on the nerves in his leg. When paired with a pressure sensor in his prosthetic foot, Ben can feel the ground as he walks to help him navigate uneven terrain.

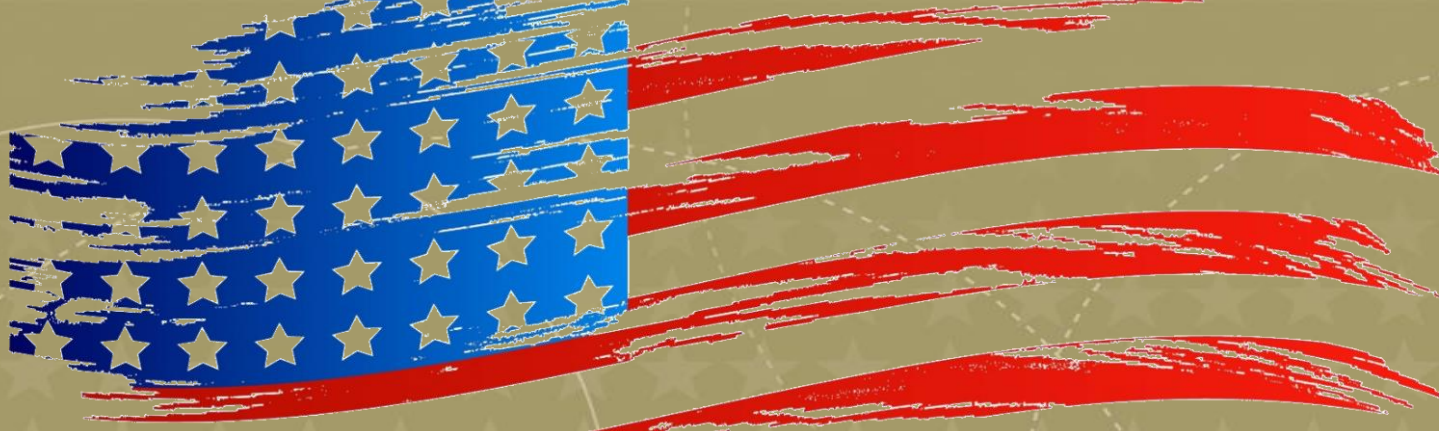
Ben described how participating in VA research impacted his life. "It gives me a sense of doing something meaningful, and to help other Veterans in the future. I am giving back," he said. Other Veterans are coming back from the war, and this can give them hope and an advantage of taking technology and using it. It fulfills me."

To other Veterans interested in participating in research, Ben says, "In my own viewpoint I am grateful that I can become a research participant. It helps other Veterans and helps myself. It is a no-lose situation; you help yourself and then help others, and it can help amputees overall."

...it gives me a sense of doing something meaningful...



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A Veteran's Experience with VA

David Powers was born in Enterprise, Alabama. As a child of a Navy sailor, he traveled the world with his family. David joined the U.S. Army at 24 years old. He was stationed in the Panama Canal Zone as an unassigned ranger from 1985–1988. After the Panama Canal, David moved to Fort Carson, Colorado, where he was with the 4th Infantry 104th Military Intelligence Delta Company Long-Range Surveillance Detachment from 1988–1991. He left the military in 1991.

On January 4, 2013, David was at the track riding a dirt bike when he suffered a spinal cord injury. He was life-flighted to MetroHealth Medical Center, where he remained in recovery for months. His family was by his side through the entire rehabilitation. David was released home after rehab. He lives an active life with family and friends despite his spinal cord injury.

David has been hospitalized with life-threatening pneumonia, upper respiratory infections, and complications many times during the years since his spinal cord injury. He has been intubated, been placed on bi-paps, and experienced many other difficult procedures in order to regain his health.

David was visiting the Louis Stokes Cleveland VA Medical Center and saw a research poster about the study “Restoration of Cough in Veterans with Spinal Cord Injury.” He contacted the research team to find out more about the study and whether he was eligible and met the participant requirements.

David had a goal of reducing his respiratory infections and staying out of the hospital. He was able to achieve this goal thanks to the study. Since he received his device he has not been hospitalized at all and has experienced only one respiratory infection to date. David’s quality of life has dramatically improved as well as his overall strength and health.

“This procedure has been the best thing we have done since David’s spinal cord injury. He is independent and now able to participate in many activities that he was not able to since his spinal cord injury. He often heads up to the pier and spends afternoons talking with the fisherman and boaters. This has been a little miracle in our lives. It has taken the worry out of our days!”

David strongly encourages other Veterans to get involved with VA Research: “Do it!” He has had a great experience with the research team and his results. He is able to be independent in his daily activities. “It feels great to be a part of a program that will benefit so many. VA Research makes a difference. The research needs to go on. The research programs not only benefit us but actually save so many lives. These programs allow our Veterans to live full lives while benefitting others!”



David Powers

...VA research makes a difference. The research needs to go on...



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**A message of appreciation to all
who made the 2nd Annual
VA Research Day on the Hill possible:**

**A special thank you to NAVREF for their
generous donation of refreshments
and their continued support for VA
Research and their commitment to
the welfare of Veterans.**

**Veterans
Researchers
Speakers**

***Event coordinators from:*
Department of Veterans Affairs
Veterans Health Administration
VA Medical Centers
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www.research.va.gov





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VA Research Day on the Hill!*

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additional information:*

www.research.va.gov

Notes

