

VHA

STATE OF INNOVATION REPORT

INNOVATION IS CHANGING AND SAVING VETERAN LIVES

OCTOBER 2021



U.S. Department
of Veterans Affairs



Choose **VA**

BREAKING BOUNDARIES

Innovation within Veterans Health Administration (VHA) is not a new concept. The pacemaker, nicotine patch, bar code medication administration system, and many other innovative breakthroughs have origins within VHA. Innovation empowers frontline staff to take calculated risks, methodically test assumptions, learn from failure, and thrive in uncertainty. Our ability to adapt and rapidly spread innovation throughout VHA, epitomizes what it means to be a learning organization. To solidify our continued commitment to delivering the best care to Veterans through innovation, VHA launched the Office of Healthcare Innovation and Learning (OHIL) in October of 2020 under the VHA Office of Discovery, Education, and Affiliate Networks.

Since its launch, VHA OHIL has brought together three powerhouse programs in order to deliver on VHA’s mission to innovate: VHA Innovation Ecosystem (VHA IE), the Simulation Learning, Evaluation, Assessment and Research Network (SimLEARN), and the Center for Care and Payment Innovation (CCPI). Through these core programs, VHA OHIL advances healthcare delivery and service by:

- Fostering the discovery and spread of grassroots and strategic innovative solutions, practices and products across VHA;
- Promoting competencies in innovation and simulation;
- Combining clinical simulation and training to further enhance the utilization and uptake of emerging healthcare technology in clinical practice;
- Developing innovative approaches to testing payment and service delivery models; and
- Advancing the use of clinical training and simulation to further VHA’s mission of becoming a high reliability organization.

Leveraging the accumulated experience and immense passion of VHA employees within America’s largest integrated healthcare system, VHA OHIL fosters the design and diffusion of innovation in collaboration with a vast community of external organizations from academic, industry, nonprofits, and other government agencies. Together, we collectively deliver innovative solutions that change and save Veteran lives.

In this report, you will find a number of example of how VHA is breaking boundaries to deliver on our innovation promise. We are excited to share this report celebrating the gamechangers who are meeting the current, and future, healthcare needs of our Nation’s Veterans. We invite you to think about what else is possible when we have the courage to break boundaries through innovation.

Steven L. Lieberman, M.D., M.B.A., FACHE, FACP
Acting Under Secretary for Health
Veterans Health Administration

Carolyn Clancy, M.D., MACP
Assistant Under Secretary for Health for Discovery, Education, and Affiliate Networks
Veterans Health Administration



OHIL LEADERSHIP



ABOUT VHA

ABOUT VETERANS HEALTH ADMINISTRATION
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CATALYZING INNOVATION

INNOVATORS NETWORK
INNOVATION FELLOWSHIP PROGRAM
DIFFUSION OF EXCELLENCE
NATIONAL CENTERS FOR INNOVATION TO IMPACT
SIMLEARN
CENTER FOR CARE AND PAYMENT INNOVATION

BREAKING BOUNDARIES

COMMUNITY ENGAGEMENT
REIMAGINING VETERAN HEALTHCARE
ADVANCED MANUFACTURING

04

08

18

50



AT A GLANCE

VETERANS HEALTH ADMINISTRATION

VHA MISSION: Honor America's Veterans by providing exceptional healthcare that improves their health and well-being.

Veterans Health Administration (VHA) has evolved into the largest integrated healthcare system in the United States, delivering primary care with a lens focused on Veteran specialty care needs, including; spinal cord injury, polytrauma, prosthetics and rehabilitation, traumatic brain injury and post-traumatic stress disorder (PTSD) treatment. Frontline staff and clinicians are dedicated to quality care, and continually improve the delivery of care to Veterans through research, partnerships, training, and the application of innovative solutions. VHA continues to be a leader in training. Today, VHA is cultivating dynamic partnerships with federal agencies, nonprofits, and private industries, as well as collaborating with academic affiliates to test innovative solutions through research. These innovations range from virtual reality for the treatment of PTSD, to telehealth, which vastly improves the accessibility of clinical services to Veterans.

Focusing on Veterans and understanding the physical, psychological, and economic determinants contributing to their health uniquely positions VHA to deliver not just healthcare, but comprehensive Veteran care.

Veterans choose VHA for the Veteran-centric model of care and expertise in service-connected health issues. Veterans stay with VHA for the community, resources, and support it builds around them.

9M

**ENROLLED
VETERANS**

>2/3

**OF MEDICAL RESIDENTS
OBTAIN A PORTION OF
THEIR TRAINING AT VA
HOSPITALS**

1/3

**VA STAFF ARE
VETERANS**

1283

**171 VA MEDICAL
CENTERS
1112 OUTPATIENT
FACILITIES**

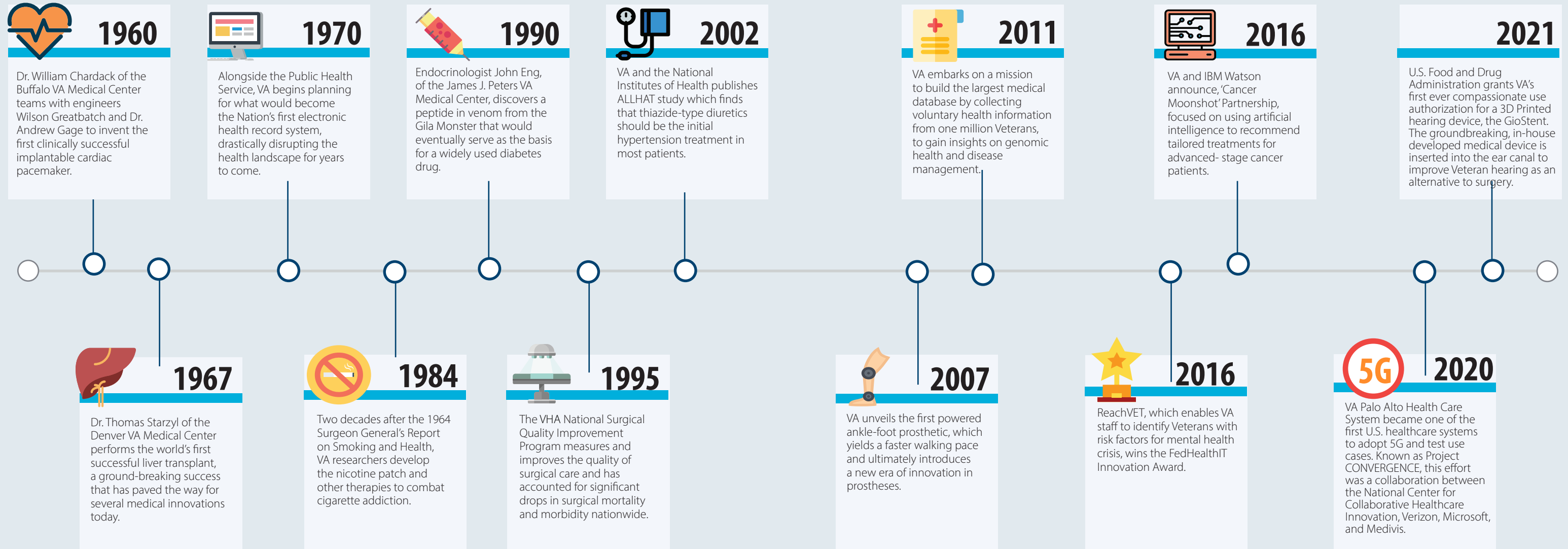
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**NOBEL PRIZE
WINNERS**

367K

**FULL-TIME
HEALTHCARE
PROFESSIONALS**

A BRIEF TIMELINE OF INNOVATION AT VHA



NOBEL PRIZE TRIFECTA



Dr. Rosalyn Yalow, the second woman ever to earn a Nobel Prize, received the 1977 Nobel Prize in Physiology or Medicine for her work in discovering the role of radioimmunoassay in insulin production, which led to major advances in diabetes research.



Dr. Andrew V. Schally, the head of the Endocrine, Polypeptide and Cancer Institute, Veterans Affairs Medical Center, in Miami, Florida, received the Nobel Prize in Physiology or Medicine in 1977. His research has more recently helped understand and treat endocrine-related diseases such as breast and prostate cancer.



Dr. Ferid Murad shared the 1998 the Nobel Prize in Physiology or Medicine with Robert F. Furchgott and Louis J. Ignarro, for their discovery regarding the natural production of nitric oxide - helping widen blood vessels to regulate blood pressure, prevent the formation of blood clots, and much more.

BUILDING THE WORKFORCE OF THE FUTURE

**“IF YOU WANT SOMETHING NEW,
YOU HAVE TO STOP DOING
SOMETHING OLD.”
—PETER F. DRUCKER**

CULTURE & CAPACITY FOR CHANGE

How do we execute our mission to deliver exceptional healthcare to Veterans? Our answer lies in creating a culture that harnesses a willingness to experiment and support frontline staff, who are the at the heart of care delivery. Innovation unlocks potential and empowers staff to take calculated risks, fail smart and fail early and methodically test assumptions.

AT A GLANCE



VHA INNOVATION ECOSYSTEM

VHA IE is the catalyst for enabling the discovery and spread of mission-driven healthcare innovation to advance care delivery and service that exceeds expectations, restores hope and builds trust within the Veteran community. As part of VHA Office of Healthcare Innovation and Learning, VHA IE leverages the collective power of innovation champions from across VA, academia, other government agencies, and industry to operationalize innovation in the Nation's largest integrated healthcare system.

VHA INNOVATION ECOSYSTEM OPERATIONAL MODEL

The VHA IE Operational Model was developed to equip innovators with a structured, repeatable, outcomes-driven process to amplify grassroots and strategic innovation across the organization. The model has four phases: **DISCOVER, TEST, REPLICATE, AND SCALE.**

FOUR CRITICAL ELEMENTS FOR INNOVATION

1. WORKFORCE CAPACITY TO ACTUALIZE INNOVATION

Investing in VHA employees to give them the tools and skillsets needed to bring innovative ideas to fruition

2. RESILIENT ORGANIZATIONAL INFRASTRUCTURE

Institutionalizing innovation through integrated, systematic, repeatable pathways for change

3. AN INNOVATION-NURTURING CULTURE

Shifting the mindset to envision innovation as everyone's responsibility to improve service delivery and create a new normal

4. STRATEGIC EXTERNAL COLLABORATIONS

Catalyzing a shift in the status-quo through novel, cross-industry collaborations that surface ideas and innovation

OUR TEAMS



VHA
Innovators
Network

Empower frontline employees and embed innovation in the core fabric of VHA



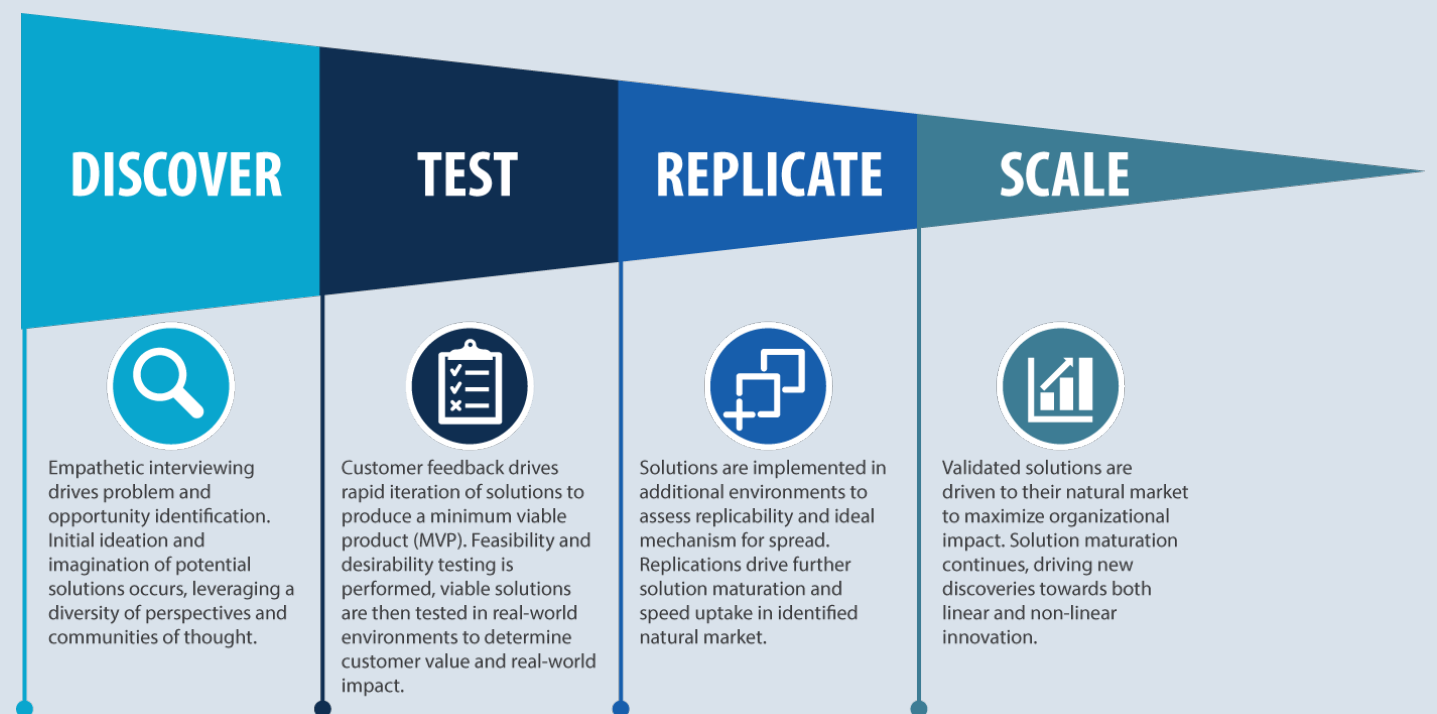
VHA
Diffusion of
Excellence

Deliver a repeatable process for discovering and scaling innovation



VHA National
Centers for
Innovation
to Impact

Foster meaningful collaboration to address VHA's most pressing healthcare challenges



The status quo is not enough – if we continue to do what we have always done, we will get the results we have always gotten. Pairing innovative thinking with the VHA IE Operational Model helps us deliver improved care now and in the future: increased access, faster diagnosis and treatment, more convenience, greater sensitivity to cultural differences and health disparities, and so much more.

5M+
VETERANS
IMPACTED

150+
FACILITIES
ENGAGED

25K
EMPLOYEES
ENGAGED

\$75M
SAVED



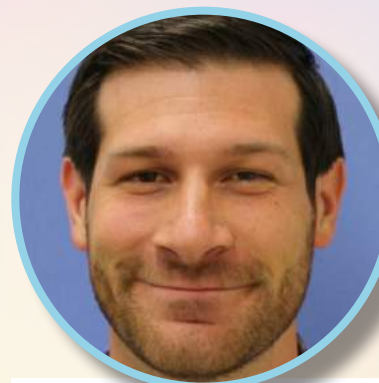
Blake Henderson
Director, VHA Diffusion of Excellence
innovation superpower: imagination



Kristopher "Kit" Teague
Executive Director, VHA Innovation Ecosystem
innovation superpower: persistence



Anne Lord Bailey, Pharm.D., BCPS
Director, Clinical Tech Innovation
innovation superpower: trailblazing



Cole Zanetti, D.O., M.P.H.
Senior Advisor, VHA Innovation Ecosystem
innovation superpower: curiosity



Amanda Purnell, Ph.D.
Director, Data and Analytics Innovation
innovation superpower: presence



George Gitche, Ph.D.
Senior Advisor, VHA Innovation Ecosystem
innovation superpower: translation



Brynn Cole
Director, Human Centered Design and Storytelling
innovation superpower: foresight



Suzanne Shirley, LCSW
Director, Community Engagement and Fellowship
innovation superpower: vision



Allison Amrhein, M.P.H.
Director, VHA Innovators Network Operations
innovation superpower: perseverance

CELEBRATING INNOVATION: VHA INNOVATION EXPERIENCE

VHA IE held the annual VHA Innovation Experience (iEX), to celebrate and recognize innovation occurring across VHA and VA staff devoted to improving VHA's ability to serve and support the heroes of our country. During the three-day event from October 27-29, 2020, innovators demonstrated their excellence in delivering outstanding care and promising solutions to Veteran populations. The event, held virtually, attracted 2,000 participants and engaged over 1,000 viewers each day through live streaming. Several of the most engaging features of the 2020 event included:

VHA SHARK TANK LIVE!

VHA Shark Tank Live! entailed a virtual competition featuring 15 passionate VA employee finalists who brought inventive, promising practices to address some of the most challenging issues faced by VHA. The finalists competed for a chance to expand their creative solutions to new VHA facilities. The finalists provided solutions that address six of the seven 2020 VHA Shark Tank Priorities including access to care for Veterans, healthcare after COVID-19, reliable culture change, rural women Veterans, upstream suicide prevention, and Veteran and employee experience. The competition inspires an opportunity to acknowledge frontline employees who have dedicated themselves to addressing crucial challenges within healthcare.

KEYNOTE ADDRESSES

Keynote addresses were presented from healthcare innovation leaders including Mark Johnson, Navy Veteran and co-founder of Innosight, a leading consulting company for innovation, and Toby Redshaw, Senior Vice President of Enterprise Innovation and 5G Solutions for Verizon. The presenters provided valuable insights for implementing successful approaches and solutions for improving Veteran health.

DEMO DAY

Demo Day showcased three minute pitch presentations including 18 innovations from Innovators Network (iNET) and five COVID-19 Maker Challenge events that demonstrated innovative approaches to crucial issues faced by Veterans.

iEX TALKS

The iEX Talks showcased TED-style innovative practices and ideas. These five to eight minute talks showcased practices from across VHA.

DIGITAL

Attendees explored digital health innovations through virtual booths, provided resources, and videos. Attendees were able to speak with representatives from organizations to hear their impressive achievements towards positively impacting Veteran lives.

VHA iEX AWARDS

During the experience, several prestigious VHA iEX Awards were presented to celebrate outstanding innovation. The awards presented included the Robert L. Jesse Award for Excellence in Innovation, the iNET Investee of the Year Award, and the Innovation Specialist of the Year Award.

VHA iEX continues to be a noteworthy event in the innovative healthcare industry, stimulating inventive and impactful conversations. VHA iEX celebrates frontline employee innovators who displayed impressive solutions to healthcare systems and outcomes for Veterans. Each innovator displays their devotion and passion to crafting, implementing, and distributing innovative practices to the healthcare system. VHA iEX promotes and celebrates innovations for healthcare that surpass expectations, inspire ambition, and provide assurance for Veterans across the nation.

2020 iNET AWARDEES

INVESTEES OF THE YEAR

Terri Ohlinger, R.N., B.S.N.

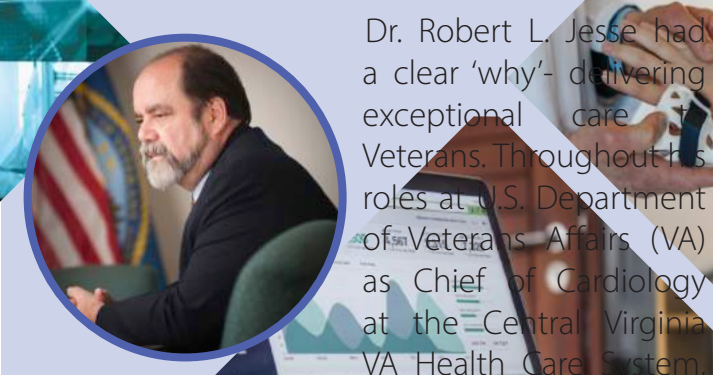
Nurse
Cincinnati VA Medical Center (VAMC)

INNOVATION SPECIALIST OF THE YEAR

Julie Whitney, R.N., M.S.N.

Innovation Specialist and Nurse
North Florida/South Georgia Veterans Health System

DR. ROBERT L. JESSE AWARD FOR EXCELLENCE IN INNOVATION



Dr. Robert L. Jesse had a clear 'why' - delivering exceptional care for Veterans. Throughout his roles at U.S. Department of Veterans Affairs (VA) as Chief of Cardiology at the Central Virginia VA Health Care System, Chief of Academic Affiliations, Principal Deputy Under Secretary for Health, and Acting Under Secretary for Health, Dr. Jesse never lost sight of this purpose and ultimately dedicated over 30 years to advancing healthcare for Veterans. The Dr. Robert L. Jesse Award for Excellence in Innovation is awarded annually and honors a current VHA employee or group of employees who demonstrate excellence and promote innovation across the enterprise either at the VA medical facility, Veterans Integrated Service Network, or VHA Program Office level.

2020 AWARD RECIPIENT



Leonie Heyworth, M.D.

National Synchronous Lead
VHA Office of Telehealth Services
VA San Diego Healthcare System

Dr. Leonie Heyworth was presented the award during VHA's virtual iEX 2020 event for her work in helping develop, implement and spur clinical adoption of real-time telehealth solutions for Veterans, such as the ATLAS (Accessing Telehealth through Local Area Stations) program and VA Video Connect (VVC).



VHA Innovation Ecosystem

2021 VHA INNOVATION ECOSYSTEM AWARDS

VHA IE strives to promote the discovery and spread of innovative healthcare solutions across VHA. VHA IE continues to influence the future of the healthcare industry and has been recognized by numerous external organizations for outstanding work. In 2021, the following VHA IE staff, programs, practices, and projects received awards:



ARTHUR S. FLEMMING AWARDS

Arthur S. Flemming Awards honor public sector leaders who demonstrate exceptional achievements within their field. **Suzanne Shirley**, was awarded for her outstanding achievements in transforming care through collaborations and advancing mission-driven healthcare innovation.



JOHN M. EISENBERG PATIENT SAFETY AND QUALITY AWARDS

John M. Eisenberg Patient Safety and Quality Awards inspire sustainable, high-quality solutions for the healthcare ecosystem. Awarded in 2021, **VHA's Rapid Naloxone Initiative** was recognized for its innovative approach to extend the availability of Naloxone to lower overdose deaths and for saving over 1,500 lives.



THE AMERICAN COUNCIL FOR TECHNOLOGY AND INDUSTRY ADVISORY COUNCIL (ACT-IAC) INNOVATION AWARDS

ACT-IAC Innovation Awards recognize remarkable innovations to improving services and government operations. Two VHA IE innovations, **Remote Temperature Monitoring for the Prevention of Diabetic Foot Ulcers** and **Smart White Cane for the Blind** were awarded for their impressive solutions.



FEDERAL LABORATORY CONSORTIUM (FLC) COVID-19 RESPONSE DISTINCTION

The FLC COVID-19 Response Distinction recognizes impactful contributions to fighting COVID-19. The **VHA 3D Printing Network** and partners were awarded this year for advancing COVID-19 efforts using 3D Printing to produce in demand medical COVID-19 supplies.



FEDHEALTHIT INNOVATION AWARDS

The FedHealthIT Innovation Awards honor programs that advance innovation across federal departments and services. **VHA IE's Democratizing Data** project was awarded for leveraging clinical data to address crucial Veteran issues, improve patient care, and provide data privacy protection. Another awardee, **Project RESILIENCE** was recognized for its creative approach to studying the impact of COVID-19 on personal and population health, and enabling an increase in access to care, lower costs, and better health outcomes for Veterans.



THEODORE ROOSEVELT GOVERNMENT LEADERSHIP AWARDS

Theodore Roosevelt Government Leadership Awards honor leaders driven by a sense of duty and devoted to the public's best interests. This year, **Suzanne Shirley**, was awarded in the category of Visionaries and praised for her devotion to improving Veteran health and services.



FEDSCOOP50

FedScoop50 awards recognize leaders who impacted the nation by leveraging technology to address COVID-19 challenges. **Dr. Thomas Osborne** was awarded 2020 Tech Champion of the Year. Thomas focused on efforts to improve care to Veterans through technological healthcare innovations, such as launching the first 5G VA hospital in California and empowering health providers with innovative tools for patient care.



VHA Innovation Ecosystem

FAST COMPANY'S BEST WORKPLACES FOR INNOVATORS

VHA IE was recognized by *Fast Company* as one of the top **100 Best Workplaces for Innovators in 2021**. The Best Workplaces for Innovators list celebrates companies that empower employees to innovate processes, products, and business methods. VHA was selected for positively impacting Veteran lives and building workforce capacity and fostering and operationalizing innovation across the enterprise. VHA IE is advancing VA as a national leader in healthcare innovation and improvement by:

FAST COMPANY



Engaging more than 150 VA facilities in identifying and scaling innovation



Training over 25,000 employees in innovation competencies and implementation methods



Impacting over 5 million Veterans through VHA IE programs, events, and products



Avoiding over \$75 million in unnecessary costs through advanced innovations and practices

SERVICE TO THE CITIZEN

The Service to the Citizen™: Champions of Change Program recognizes public servants who demonstrate excellence in delivering services that impact the public's lives. This year, four VHA IE leaders were recognized for their transformative leadership impacting Veterans nationwide. The 2021 VHA IE honorees reimagined what it means to deliver individualized care to Veterans and customizable solutions for patients' needs.



Beth Ripley, M.D., Ph.D.

VHA 3D Printing Network
Securing mission-critical personal protective equipment (PPE) during COVID-19 by leveraging manufacturing capabilities



Joshua Patterson

Project RESILIENCE
Utilizing biosensors for monitoring population health



Suzanne Shirley, LCSW

VHA Innovation Ecosystem
Transforming the way VA engages with both internal and external collaborators



Thomas Osborne, M.D.

Project CONVERGENCE
Developing a roadmap for testing technologies enabled by 5G networking

CATALYZING INNOVATION

**“A GOAL WITHOUT
A PLAN IS JUST A
WISH.”**

-ANTOINE DE SAINT-EXUPÉRY

Working collaboratively to connect the dots to tackle problems and opportunities allows us to accelerate ideas into practice. Innovation at VHA is fueled by passion and requires changemakers at every level of the enterprise to be relentless in improving and creating new experiences for Veterans.

INNOVATORS NETWORK

REVOLUTIONIZING FRONTLINE INNOVATION

Jane is traveling to her nearest medical center for an appointment. She negotiated time for the appointment over her lunch break and is on edge before she sets foot on hospital ground. She finally finds a parking space after four laps of the parking lot. Her frustration doubles and she's not even in the building. Jane walks in the hospital, checks-in for her appointment, and waits.

Jane's experience has already been a nerve-wracking one and her appointment has yet to begin. Now, quadruple Jane's anxiety because her appointment today is for a breast biopsy after an abnormal mammography. The mammography technologist calls Jane back for her biopsy and she can already feel her palms start to sweat and heart rate increase.

The technologist tells Jane that because the biopsy area is on the underside of her breast, she must stand during the procedure as the machine is flipped to catch the best angle. Jane stands-up and the technologist and team try to position her correctly for the biopsy. The biopsy needle barely makes contact and Jane starts to feel clammy and faint. She must sit down.

The procedure starts and stops another three times before the team manages to complete the biopsy. Jane has to stay in a recovery room for two hours, misses the rest of her workday, and can only hope the team managed to get an adequate sample so she doesn't have to go for a fifth-take another day.

She is exhausted and embarrassed. This scenario is unfortunately not an uncommon occurrence for mammography-assisted biopsy patients throughout the country. This scenario happens at VA medical centers across the country as well.

Luckily, VA has frontline innovators like Natalie Mandel, who is eager to give patients like Jane a better experience with her innovative "Simplicity" mammography biopsy chair. Even more fortunate, VA has the VHA Innovators Network (iNET) to engage and empower frontline employee innovators and support their innovative solutions from spark to impact.

33 iNET SITES

- Central Arkansas (Little Rock) Veterans Healthcare System
- Central Virginia (Richmond) VA Medical Center
- Chalmers P. Wylie (Columbus) Ambulatory Care Center
- Charles George (Asheville) VA Medical Center
- Charlie Norwood (Augusta) VA Medical Center
- Chillicothe VA Medical Center
- Cincinnati VA Medical Center
- Clement J. Zablocki (Milwaukee) VA Medical Center
- Durham VA Medical Center
- Edward Hines Jr. (Hines) VA Hospital
- Gulf Coast (Biloxi) Veterans Health Care System
- Lebanon VA Medical Center
- Louis Stokes Cleveland VA Medical Center
- Memphis VA Medical Center
- Minneapolis VA Health Care System
- New Mexico (Albuquerque) VA Health Care System
- North Florida/South Georgia (Gainesville) Veterans Health System
- Orlando VA Medical Center
- San Francisco VA Health Care System
- Sheridan VA Medical Center
- Tomah VA Medical Center
- Tuscaloosa VA Medical Center
- VA Boston (Jamaica Plain) Healthcare System
- VA Central Iowa (Des Moines) Health Care System
- VA Eastern Colorado (Aurora) Health Care System
- VA Greater Los Angeles Healthcare System
- VA Palo Alto Health Care System
- VA Pittsburgh Healthcare System
- VA Puget Sound (Seattle) Health Care System (Seattle, WA)
- VA Salt Lake City Health Care System
- VA San Diego Healthcare System
- VA Sierra Nevada (Reno) Health Care System (Reno, NV)
- VA Western Colorado (Grand Junction) Health Care System



VHA Innovators Network

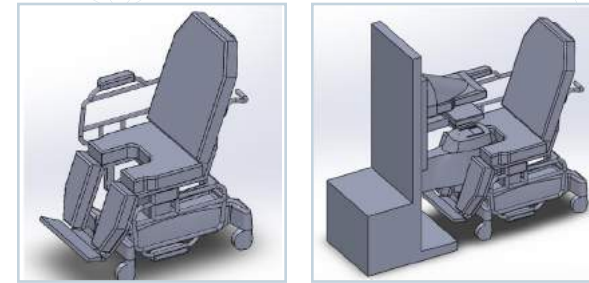


Diagram of the innovative "Simplicity" mammography biopsy chair designed by Natalie Mandel.

EMPOWERED TO IMPACT

Natalie Mandel is a Diagnostic Radiologic Technologist at the VA Northeast Ohio Healthcare System in Cleveland. After observing Jane's scenario too many times, she decided to take action. Natalie applied to iNET's Spark-Seed-Spread Innovation Investment Program for support designing her solution. After one year and countless hours collecting patient and clinical staff insights on the problem, she finalized her design for "Simplicity", a special mammography biopsy chair aiming to be more functional, efficient, and comfortable for the patient. Next for Natalie, turning her design into a prototype for testing.

Natalie embodies the spirit of iNET. By empowering frontline employees to identify Veterans' needs and encouraging experimentation with small-scale solutions to meet those needs, iNET fosters the discovery of the best methods and new models of care for all.

As a part of the VHA Innovation Ecosystem, iNET has been breaking barriers to innovation since its inception. iNET aims to radically change behaviors, habits, and capabilities—the culture—throughout the country's largest healthcare system. iNET is as much about a transformation of frontline employees as people, as it is the solutions they create.

IDENTIFYING INNOVATORS

How does iNET engage frontline employees in this cultural revolution? A three-tiered Spark-Seed-Spread Innovation Investment Program invests in frontline employees with the resources (primarily small amounts of funding for project costs) to explore a problem they aim to solve, then design, develop, and test their ideas and solutions in an accelerated life cycle. The terms spark (design), seed (prototype/test), and spread (test/implement) describe the maturation of the solution. Through Spark-Seed-Spread, iNET identifies deeply committed employees (like Natalie) and then trains them to think differently as they create and implement their solutions.

Go Fish is another iNET program that extends the opportunity to "do" innovation into the wider VHA community. It is an opportunity for any VA employee to pitch their idea to iNET's team of Innovation Specialist to find a VAMC interested in supporting their solution design and development. This program grants exposure to the innovators and creates a forum for communicating ideas and information. It also builds a powerful network of forward-thinking reformers.

SUPPORTING TRANSFORMATION

iNET revolves around a core set of fundamental teachings (Human Centered Design, storytelling, The Three Box Solution, and Lean Methodology) and hosts opportunities for frontline employees to participate in learning the basics of innovation as a competency. The Incubator is an annual, six-session virtual experience scheduled over the course of four months. Part workshop, part training, part panel discussion, it brings together iNET leadership, innovation specialists, alumni innovators, and external experts to share their approaches to healthcare innovation. Participating employees gain tools and templates to refine or start working on their own ideas and learn more about other opportunities offered by iNET. In this way, the Incubator brings more employees into iNET from throughout the entire healthcare system. The Spark-Seed-Spread Innovation Accelerator (accessible only to Spark-Seed-Spread investees) supports employees with early-stage ideas through an education consisting of a process of intense, rapid, and immersive education aimed at accelerating the life cycle of young innovative ideas. The Accelerator compresses years' worth of learning-by-doing into just a few months and provides employees resources and tools to achieve success.

LOOKING AHEAD

VHA is an innovation leader in the healthcare industry. The dedication to Veteran care and the passion for improvement has fueled visions of progress and disruption. The Veteran community is unique in its composition and its needs. At the same time vibrant and vulnerable, innovation to their care model is a necessity not a luxury. Each of the mechanisms described here enables iNET to empower frontline employees and revolutionize a caregiving culture.

iNET has and will continue to be the friend to the innovator. It will support growth, change and development through its network and its structure. We are the solution we seek; everyday people like Natalie can make a difference. iNET is here to make that possible.

INNOVATORS NETWORK



POPULATION HEALTH MANAGEMENT TOOL FOR BIOLOGICS V1.0

Kushal Shah, the Clinical Pharmacy Supervisor at VA Great Lakes Health Care System, was frustrated with the time-consuming, manual approach to gathering and reviewing patient data. He developed the Population Health Management Tool (PHM) as a simple, effective way to automate the capture of pertinent patient information. The PHM is a software program that collects identification data and information on patient medication(s), testing, and clinical visits. PHM also acts as an alert system that generates flags for missed appointments, incorrect medical information, and other incongruencies. The tool allows clinicians to shift limited time from the patient review process to focused patient care.

The PHM pilot program was implemented in Shah's Dermatology Outpatient Center and in 3 months the Center saw a cost savings of over \$500,000 attributable to accuracy of medication data, reduced intervention, and efficient use of resources. More importantly, the shift for clinicians to focus on delivering care led to improvements in patient care encounters. The next step is to expand the use of this tool locally beyond the Dermatology Center, then to other VAMCs. "I am pursuing innovation as part of my larger goal to impact more Veteran lives," says Shah. He believes innovation is the key to providing "quality care to Veterans in a cost-effective and timely manner."



REMOTE THERAPEUTIC REALITY EQUINE ASSISTED ACTIVITIES AND THERAPIES

Francesca Zeringue, an Advanced Medical Support Assistant at VA Salt Lake City Health Care System, believes in promoting and delivering mental healthcare for Veterans. Zeringue saw potential in Equine Assisted Interventions (EAI), which use horses as therapeutic partners, to reduce depression, anxiety, and suicide in Veterans. Undeterred by the pandemic's impact on in-person activities, she searched for alternative means of delivery and found Virtual Reality (VR) technology. By applying EAI and VR technology, Zeringue created the Remote Therapeutic Reality Equine Assisted Activities and Therapies (RTREAAT) program, an immersive experience for patients to interact with the horses using senses such as sight (through VR headsets), sound (through surround-sound headphones), and touch (through haptic feedback gloves).

Zeringue has seen firsthand how EAI programs have helped improve Veteran self-confidence and their communication skills. RTREAAT collaborated with Utah State University to film and edit the trail ride experience for the VR sessions, and an external team of VR experts at Remote Reality to act as advisors to help bring the experience to life. Zeringue believes RTREAAT can deliver the positive impact of EAI programs to a larger Veteran community. "If RTREAAT can save one Veteran's life, it is worth it," says Zeringue, "but I believe it will save more; this is my passion and what drives me."

PROJECT SPOTLIGHTS



VIRTUAL REALITY THERAPEUTICS FOR PAIN MANAGEMENT

As a Community Living Center Nurse at VA Sierra Nevada Health Care System, Megan Rumzie, comes into daily contact with Veterans burdened with chronic pain that pharmaceutical interventions no longer seem to alleviate. Her research introduced her to virtual reality (VR) therapies as a complementary and integrative health avenue to manage pain. Delving deeper, Rumzie discovered AppliedVR, which offers a deeply researched VR platform and is pioneering virtual reality therapeutics (VRx) to address unmet needs and improve clinical outcomes for patients with serious health conditions. VRx patients have access to a diverse menu of experiences and can choose the best ones for themselves. This approach puts them directly in charge of their own care, which aligns with VHA's mission of patient-centered care.

The initial implementation of this project has had direct positive impact on Veteran care, comfort, and connection. "Even with lockdown," Rumzie confirms, Veterans "still prioritize the VR therapeutics sessions." During these sessions, they feel they are being transported to another dimension and are completely immersed in the experience that they have chosen. Participants reported a 75% reduction in pain and a 95% decrease in stress and anxiety. Almost every participant wants to add the therapy to their care program. One very important outcome is that the Veterans have made impactful connections with the care team and with each other. "I truly have the best job," says Rumzie.



REVERSE BOOM PATIENT LIFT

Veterans dealing with acute mental health conditions have requirements that not all VA medical centers can accommodate, like platform beds to protect patients from the ligature risks of regular hospital beds. Ashley Crooks, the Safe Patient Handling and Mobility Coordinator at Minneapolis VA Health Care System recognized that the platform beds needed by Veterans displaying acute mental health symptoms were not compatible with the hydraulic lifts designed to safely lift patients in and out of hospital beds. The alternative of manual patient transfers can cause escalated levels of stress, exacerbation of symptoms, and place patients and staff at risk of injury. In response, she designed the Reverse Boom Patient Lift, which can safely transfer patients and is compatible with platform beds. Crooks believes the design will protect staff from carrying out potentially harmful actions and provide the safety needed to prevent manual handling.

"I am committed to this project," says Crooks, "I have worked in mental health areas, and believe in the success that inpatient services can deliver to Veterans." Crooks is working with acute mental health providers, physical therapy staff, and other front-line stakeholders to ensure usability and effectiveness of her prototype. The Reverse Boom Patient Lift has the potential to increase access to inpatient mental healthcare for Veterans everywhere, thus reducing the number untreated mental health conditions and the potential to rate of suicide.

INNOVATORS NETWORK

WELCOME, iNET GREENHOUSE INITIATIVE

The Greenhouse Initiative (Greenhouse) is the newest initiative from the iNET portfolio of the VHA Innovation Ecosystem. Building on its success from internal programs such as Spark-Seed-Spread, the Greenhouse brings the unique combination of clinical expertise, end-user experience, and a collaborative environment to external collaborators. This Initiative is an opportunity for the healthcare innovation community to collaborate with iNET sites throughout the country at the earliest stages of innovation. External innovators with concepts can develop functional prototypes, get end-user feedback and conduct small-scale feasibility testing of their solutions.

While the Greenhouse brings obvious valuable offerings to the external innovator, the Initiative, is at its core, another iNET opportunity for frontline VA employees to participate in the process of innovating in an effort to shift the culture of the organization. iNET is built on the premise that frontline healthcare employees should play a major role in designing and developing the future of healthcare. Founded in 2020, the Greenhouse provides the platform for these internal advocates to work directly with the healthcare innovation community in designing the innovative products of the future. iNET's Innovation Specialists will bring their notable expertise to each Greenhouse collaboration as the project design leads. The external collaborators have access to healthcare professionals and millions of potential end-users, allowing VA to develop transformative solutions with reduced risk and financial outlay.

The Greenhouse focuses on early-stage innovation and ideation projects – those that are pre-market – and offers the opportunity of investments for prototypes to be co-designed and tested within VA. It features an open application process where any external innovator can give a synopsis of their potential solution, including the foreseen impact to the healthcare model. Within a few weeks, the iNET team evaluates the proposals and



determines the ones which align most with VA and VHA Innovation Ecosystem priorities. From there, the collaborators present to a panel of Innovation Specialists in an endeavor to get their interest and buy-in. Finally, the iNET Director approves the project and pairs the collaborator with an Innovation Specialist. This straightforward approach has seen innovators flocking to the Greenhouse in the short time it has been running.

The Greenhouse is changing the way external innovators can collaborate with VA. Competition is tough though, of over 125 applications, only 37 have translated into active projects. iNET leadership sticks closely to the root of iNET's mission when selecting projects empowering VA frontline employees to revolutionize organizational culture through innovation. Greenhouse projects are truly collaborative on every level and innovators applying must have an innovative at the earliest stages of the design process. Here are three Greenhouse projects setting the bar for collaborative innovation:

1. WAREOLOGIE – In 2020, a team of makers designed a novel portable parallel physical therapy (PT) bar device as part of a maker challenge. This novel device is a physical therapy tool that can be easily moved to different rooms, allowing nursing home residents who are in isolation to continue with their physical therapy. Through Greenhouse, the Wareologie team and their partners will create the first two functional prototypes of the device, which will be user experience tested at Central Virginia VA Health Care System, in Richmond, VA, for user acceptance by an interdisciplinary Greenhouse team of subject matter experts and Veterans.

2. CIBUS HEALTH – Cibus Health is developing a nutrition-focused technology platform for clinicians to support their patients suffering from chronic conditions through a prescribed and personalized nutrition support program. They envision a world where food is “prescribed” just like pills to help patients in the prevention, treatment, and management of chronic conditions. They are collaborating with six VAMCs through discovery interviews with VA clinical experts and Veterans and User Experience (UX) testing of the platform.

3. FEELTECT – FeelTect's mission is to disruptively improve wound care by developing connected health solutions to enable safety, efficacy and empowerment. Their Tight Alright technology features connected health platform for measuring and monitoring compression therapy for venous leg ulcers (VLUs).

This collaboration has the potential to help Veterans with VLUs achieve maximum rate of healing with minimal disruption to quality of life by utilizing the Tight Alright device and mobile application at the point of care and the remote monitoring capabilities of the digital platform. VHA SMEs will provide feedback on Tight Alright itself, which could influence further iterations of the device and the strategy for clinical implementation.

All markers indicate that the Greenhouse is a successful addition to iNET's innovation portfolio. Its popularity amongst the innovation community, the quality of its end products and the breadth of its subject matter show that Greenhouse-supported projects are striving to meet Veteran-specific needs. It was established to stimulate collaboration between external healthcare innovators and the iNET community. We all look forward to reaping the benefits of this co-creation Initiative in the future of healthcare for Veterans.



VHA Innovators Network

VHA INNOVATION ECOSYSTEM FELLOWSHIP PROGRAM

VHA IE established the Entrepreneur in Residence and Senior Innovation Fellowship programs to build the innovative leaders of tomorrow and to spread mission-driven advances in healthcare delivery across VHA. These programs offer unique experiential learning opportunities for emerging and accomplished VHA leaders with a dynamic presence, passion for innovation, and vision for the future. Fellows are empowered through strategic guidance and relationship development to become change agents and catalytic leaders capable of championing solutions that will improve healthcare for Veterans.

ENTREPRENEUR IN RESIDENCE AND SENIOR INNOVATION FELLOWSHIP

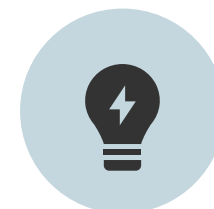
The Entrepreneur in Residence Fellowship seeks to engage emerging leaders prepared to implement an innovative project that leverages internal stakeholders and leaders at their local institutions and beyond. The Senior Innovation Fellowship seeks to engage accomplished leaders prepared to implement a national scale project that leverages internal and external stakeholders throughout the organization, government, academia, and industry. Both programs will engage the Fellows during the fellowship year to participate in experiential learning and develop essential skills. Some of these skills include public speaking, storytelling, building and expanding their professional networks, developing a business case, engaging early adopters, and navigating complex aspects of the organization. Through inspiring change, the Fellows continue to solidify their role in healthcare as thought leaders and change agents whose work has a profound impact on the organization and the lives of Veterans everywhere.

WHAT MAKES THE VHA IE FELLOWSHIP DIFFERENT?

The VHA Innovation Fellowship Program

- **Leverages an experiential approach versus strictly a didactic learning experience common to most fellowship opportunities**
- **Focuses on convening stakeholders, navigating different facets of VHA, Executive level mentorship, driving transformation of healthcare through specific projects/initiatives, and more**
- **Offers protected time, resources, and project management support to equip Fellows with the tools needed to take their project/initiative to the next level**

SNAPSHOT OF FELLOWSHIP PROJECTS SINCE 2019



55%
ARE SCALING THEIR INITIATIVES ENTERPRISE-WIDE



78%
COLLABORATING WITH VA PROGRAM OFFICES



67%
ARE WORKING WITH ACADEMIA & INDUSTRY COLLABORATORS TO ADVANCE THEIR INITIATIVES



45%
RECEIVED INDEPENDENT AWARDS & RECOGNITION FOR THEIR INITIATIVES

"My fellowship experience is quite amazing and it enhanced my collaboration, negotiation, management and leadership skills tremendously ... which is helping me to navigate the pathway to work on this complex initiative and taught me unimpeachable morals and characteristics of the leader I want to become."

-Indra Sandal
2021 Innovation Fellow

MIT CATALYST: FELLOWSHIP COLLABORATION WITH VHA IE

The Massachusetts Institute of Technology (MIT) Catalyst Fellowship Program's mission is to increase the potential impact of biomedical research and improve the likelihood that newly developed solutions will address unmet healthcare needs in VHA. MIT Catalyst's framework provides the opportunity for the acceleration of innovative ideas to health care impact.

Participating Fellows are recruited from VHA, academia and industry to form cross-functional teams and bring incredible diversity to the program. These Fellows are engineers, clinicians, scientists, researchers, MBAs, entrepreneurs and more. Each Fellow, in turn, benefits from the unique opportunity to collaborate within their diverse cohorts to solve healthcare challenges with the aim to advance healthcare globally. The program enables Fellows to test and hone their solutions into practical and effective proofs of concept guided by a cross-functional faculty team and with the support of IE programs like iNET Greenhouse, Spark-Seed-Spread and Diffusion of Excellence.

The MIT Catalyst Fellowship Collaboration with VHA includes a six-month academic experience for Fellows, with three Intensification Sessions. These Intensifications provide space for Fellows to identify high priority challenges, needs, and opportunities and collectively generate solutions as they are guided by experienced faculty and other mentors. While many of the Fellows' projects are in the early phases of the Catalyst process, successfully established projects include the development of a device for the treatment of Obstructive Sleep Apnea (OSA) and a newly funded Spark-Seed-Spread project related to effective elimination of unused opioids.



2021 INNOVATION FELLOWS



RAVI RASALINGAM, M.B.Ch.B.
ENTREPRENEUR IN RESIDENCE
VA BOSTON HEALTHCARE SYSTEM

Dr. Ravi Rasalingam is a Cardiologist at VA Boston Healthcare System and a clinical instructor at Harvard Medical School. Though his clinical expertise is in cardiology, Dr. Rasalingam is in the process of developing a device for the treatment of Obstructive Sleep Apnea (OSA). His innovative project, The Novel Device for Treatment of Obstructive Sleep Apnea, leverages 3D design and print technologies to produce a custom-fit mouthguard as a more comfortable alternative to the CPAP machine. As both an MIT Catalyst Fellow and Entrepreneur in Residence, he is producing the first prototypes for the device and will soon begin testing, bringing a solution to the very Veterans that inspired him to innovate.



RAZA HUSSAIN, D.M.D.
ENTREPRENEUR IN RESIDENCE
JESSE BROWN VA MEDICAL CENTER

Dr. Raza Hussain serves as the Chief, Oral and Maxillofacial Surgery (OMFS) at the Jesse Brown VA Medical Center. As an Entrepreneur in Residence, Dr. Hussain is currently working on Teeth in a Day, a program that aims to redefine OMFS by offering implant-based, immediate load, full-arch prosthodontic rehabilitation of a patient's entire missing dentition and surrounding soft tissue structures. With this method, an eligible Veteran who is missing all of his/her teeth, or who has teeth damaged beyond repair, can have them replaced with an implant retained prosthesis in one appointment.



ARASH HARZAND, M.D., M.B.A., FACC
SENIOR INNOVATION FELLOW
ATLANTA VA MEDICAL CENTER

Dr. Arash Harzand is the Director of Digital Cardiology at Atlanta VA Medical Center and Assistant Professor of Medicine at Emory, focusing on integrating Veteran-facing technologies – including video-to-home, wearable devices, and remote monitoring – into new-care pathways for heart and vascular disease. As a Senior Innovation Fellow, Dr. Harzand leads the development of an enterprise innovation strategy on digital health and the design of a Digital Health Platform to deliver high-value care using early-stage digital health solutions for Veterans and VA clinicians, staff and leadership.



INDRA SANDAL, Ph.D., M.B.A.
ENTREPRENEUR IN RESIDENCE
MEMPHIS VA MEDICAL CENTER

Dr. Indra Sandal is an Innovation Specialist at the Memphis VAMC where she leads hospital-wide innovation. As an Entrepreneur in Residence, Dr. Sandal built a coalition between Veterans Integrated Services Networks 9 and 15, and launched the VHA-Uber Health Connect (VUHC) initiative through a novel collaboration between VHA Innovation Ecosystem, Uber Health Rideshare Services and the Veterans Transportation Program Office to overcome transportation barriers to VHA access for Veterans. This partnership integrates a HIPAA compliant technology solution of Uber Health into a VAMC's existing transportation system and provides a ride-sourcing platform to bring Veterans to and from their providers. VUHC has a threefold impact: reduction of no-shows, positive health outcomes for Veterans, and cost savings for medical centers.



GEORGE AKINGBA, M.D., Ph.D.
ENTREPRENEUR IN RESIDENCE
VA MEDICAL CENTER IN WASHINGTON, D.C.

Dr. George Akingba is a Vascular Surgeon at the Veteran Affairs (VA) Medical Center in Washington, D.C. Thanks to his background in medicine and biomedical engineering, Dr. Akingba shares a passion for finding innovative engineering solutions to solve clinical challenges. His areas of expertise led him to develop a Retraction Housing Device (RHOD) that uses three-dimensional print (3DP) technology to effectively reduce interventional procedural time, sedation requirements, overall costs associated with performing complex interventional procedures, and indirectly reduce radiation exposure. As an Entrepreneur in Residence, Dr. Akingba is optimizing his patented device to be tested for real-world impact.



ELI KAUFMAN, CPO
ENTREPRENEUR IN RESIDENCE
VA PUGET SOUND HEALTH CARE SYSTEM

Eli Kaufman is a Certified Prosthetist/Orthotist and the National Program Coordinator for Mobile Prosthetic and Orthotic Care (MoPOC), an Enterprise-Wide Initiative through the VHA Office of Rural Health in partnership with Rehabilitation and Prosthetic Services. Through his work in MoPOC, Mr. Kaufman aims to increase access to care for Veterans with artificial limb and complex bracing needs by reducing or eliminating the patient burden of travel. Mr. Kaufman is also a Research Prosthetist at the Center for Limb Loss & MoBility (CLiMB) at VA Puget Sound Health Care System in Seattle, WA. Mr. Kaufman collaborates to research and develop emerging technologies and clinical practices to enhance mobility for individuals with limb differences and neuromusculoskeletal impairments.



MICHAEL AMENDOLA, M.D., M.E.H.P.
SENIOR INNOVATION FELLOW
CENTRAL VIRGINIA VA HEALTH CARE SYSTEM

Dr. Michael Amendola is the Chief of Vascular Surgery, Director of the Non-Invasive Vascular Lab, and Program Director for the Chief Resident in Quality and Patient Safety at The Central Virginia VA Health Care System. He is a Professor of Surgery at Virginia Commonwealth University School of Medicine and Adjunct Faculty at Johns Hopkins School of Education. As a Senior Innovation Fellow, Dr. Amendola created a local 3D Printing (3DP) for pre-surgical planning curriculum for surgeons and contributed to launching a national VHA training course to introduce healthcare teams to 3DP technology. Dr. Amendola has also worked towards establishing a national quality assurance process for the validation of 3DP pre-surgical models with the Food and Drug Administration and is leading legal and regulatory discussions with the VA Office of General Counsel as a national VHA 3DP clinical champion.

DIFFUSION OF EXCELLENCE

“Diffusion of Excellence enables our partnered practices and innovations to sustainably scale across our nationwide healthcare system to maximize their impact.”

– Blake Henderson,
Director, VHA Diffusion of Excellence

The goal of VHA’s Diffusion of Excellence Program is to identify and disseminate clinical and administrative best practices and standardize those that promote positive outcomes for Veterans systemwide. Diffusion of Excellence meets this goal by implementing a model to discover, test, replicate, and scale innovations. Since its inception in 2015, the program has hosted six national VHA Shark Tank Competitions, identified 69 Promising Practices, diffused 10 National Diffusion Practices across the enterprise, and led over 800 Promising Practice replications. In 2021, Diffusion of Excellence released the Diffusion of Excellence Playbook and deployed the Diffusion of Excellence Emerging Technology Team as two mechanisms to amplify innovative best practices. Ultimately, Diffusion of Excellence has discovered unique ways to empower VA workforce, make efforts of the program more readily understandable to peers and leadership, and unlock broader impact across the healthcare enterprise for emerging Promising Practices.

DIFFUSION MARKETPLACE

In the spirit of knowledge sharing, the Diffusion Marketplace, an interactive centralized repository of Promising Practices across the enterprise, applied human-centered design updates to deliver a seamless experience and further enable VHA’s success as a learning healthcare system. In the last year, Diffusion Marketplace has become the preferred platform to highlight over 130 Promising Practices with more than 20,000 total practice page views, a monthly newsletter with 13,000 subscribers and counting, and perhaps most notably, a public-facing website to share VA’s innovations with other healthcare systems and external partners. Diffusion of Excellence prioritized the search experience and encouraged Marketplace visitors to search practices by various categories, by region (My VISN), by facility (My VAMC), and by originating or adopting location.

[MARKETPLACE.VA.GOV](https://marketplace.va.gov)

VHA DIFFUSION ACADEMY

The 2021 class of VHA Diffusion Academy hosted innovators from Diffusion of Excellence, VHA Innovators Network, and Quality Enhancement Research Initiative (QUERI) portfolios providing opportunities related to the promotion of project team cohesion, replication strategy advancement, national stakeholder buy-in, strategic communication, and resources for growth and sustainment. This year, Diffusion Academy virtually hosted 8 practices to propel innovative projects towards sustainability and scaling with continued active engagement through workshops and community mentorship. The curriculum offered flexibility to assess each project team’s specific needs during the development of their 1-2-year Business Plan while ensuring the inclusion of important considerations such as team cohesion, replication pathways, strategic communication, and resourcing opportunities.



VHA SHARK TANK COMPETITION

As part of Diffusion of Excellence, the VHA Shark Tank Competition serves as a mechanism to identify field-developed practices that promote positive outcomes and improved experiences for Veterans and employees. Open to all VHA employees, the Competition shines a spotlight on employees passionate about solving some of the toughest challenges across VHA and provides them with a platform to bring exposure from all levels of leadership to their practices that are elevating the standard of care for Veterans. To be eligible, applicants must successfully implement their practice in at least one facility, collect data-based results for at least one month, and the practice must address one of the VHA Shark Tank Priorities.

Submitted practices undergo two rounds of evaluation by VHA subject matter experts, and applicants compete for the opportunity to be one of 15 Finalists who pitch their practice at the live Competition to Medical Center and Veterans Integrated Service Network (VISN) Director Sharks. Sharks bid resources—such as funding, staff, or time—to replicate the practices they want in their facility or VISN. Winning practices from the Competition receive Promising Practice designation and proceed with six to nine months of facilitated replication in the winning Sharks’ facility or VISN. Winners also gain access to project management, communication, and technical support from Diffusion of Excellence, which helps applicants with impact studies to determine scaling feasibility, support for conference and award submissions, and national rollout. By the end of the Diffusion of Excellence program, winners can expect to package knowledge-based materials for their practice, confirm desired clinical or operational impact in different settings, and engage with national stakeholders to garner their input and support.

THE 2021 VHA SHARK TANK PRIORITIES INCLUDE

- Age-Friendly Health Systems
- Enabling Rural Veterans to Thrive
- Healthcare After COVID-19 – Post-Pandemic Care
- Healthcare Technologies and Tools
- Health Equity
- High Reliability Culture Change – Commit to Zero Harm
- Suicide Prevention
- VA and Community Healthcare Access
- Veteran and Employee Experience
- Whole Health



VHA DIFFUSION OF EXCELLENCE PROGRAM PLAYBOOK

The VHA Diffusion of Excellence Program Playbook was published to serve as a “bread crumb trail” to the program’s processes and functions as a practical guide to diffusing innovative practices across an organization’s ecosystem and beyond. It shows organizations unique ways to empower their workforces, make their innovative efforts more readily accessible and understandable to peers and leadership, and unlock and amplify impacts.



DIFFUSION OF EXCELLENCE



EMBEDDING PHYSICAL THERAPY (PT) IN PATIENT ALIGNED CARE TEAM (PACT)

Early intervention physical therapy (PT) for musculoskeletal complaints has been shown to improve functional outcomes, reduce costs, and reduce the incidence of chronic pain. Embedding Physical Therapy (PT) in Patient Aligned Care Team (PACT) is a practice, established at VA Midwest Health Care Network, that places a physical therapist in primary care to address musculoskeletal complaints and increase Veteran access to care. By embedding PT into PACT, the Veteran can more readily access same-day care for musculoskeletal pain complaints or other concerns, reducing the risk of chronicity or other sequelae of delayed care. Veterans are also able to receive certain prosthetic items, such as gait assistive devices from a PT without travel to other parts of the hospital. The Embedding PT in PACT practice has been adopted at 18 VA Medical Centers and 42 Community Based Outpatient Clinics (CBOCs).

NATIONAL ORGANIZATION FOR NV-HAP PREVENTION (NOHAP)

Hospital-Acquired Pneumonia is the #1 hospital-acquired infection in the U.S. and 60% of those cases occur among non-ventilated patients. Providing consistent oral hygiene during hospital and long-term care admissions is a simple and effective way to reduce the risk of pneumonia by lowering the number of bacteria in the mouth that may be aspirated into the lungs. Fortunately, VA and industry partners are discovering effective ways to prevent Non-Ventilator Associated Hospital-Acquired Pneumonia (NV-HAP). Established in 2019, the National Organization for NV-HAP Prevention (NOHAP), a national level working group consisting of VA leadership and external representatives from the Centers for Disease Control and Prevention, the Joint Commission, the Food and Drug Administration, the Health Resources and Services Administration, insurers including Medicare and Medicaid, the Patient Safety Movement Foundation, academia, and private industry. NOHAP works to implement effective prevention strategies to improve patient safety, enhance quality of life, and save lives. To date, NOHAP has created several publications to spread the word about NV-HAP prevention and NV-HAP prevention has been adopted by every VA Medical Center nationwide.



PRACTICE HIGHLIGHTS



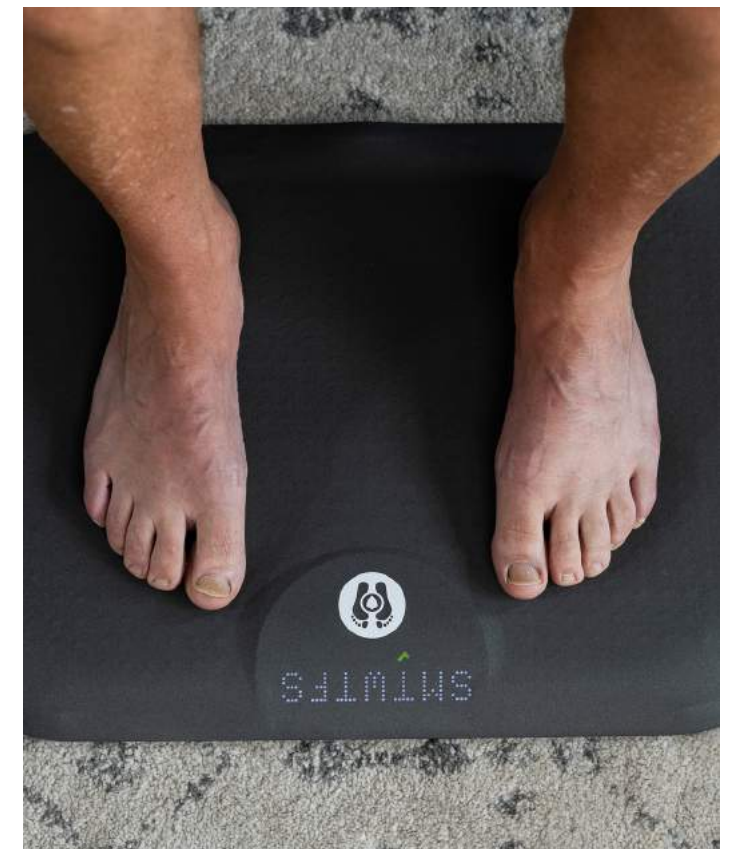
PRIDE IN ALL WHO SERVED (PRIDE)

"LGBTQ+ Veterans are at an increased risk for healthcare disparities, especially suicide, due in part to discrimination and difficulty accessing healthcare," said Dr. Michelle Hilgeman, clinical psychologist at Tuscaloosa VA Medical Center. Clinical psychologists, Dr. Hilgeman and Dr. Tiffany Lange co-created the PRIDE in All Who Served (PRIDE) program. PRIDE is a 10-week health education program that helps VHA clinical staff better provide affirming care to VA's numerous lesbian, gay, bisexual, transgender, and queer or questioning Veterans. PRIDE focuses on overall wellness, increasing social connectedness, and empowering LGBTQ+ Veterans to engage in VHA services relevant to their personal healthcare needs. As of June 2021, PRIDE has impacted over 500 Unique Veterans, trained nearly 900 clinical staff, and is implemented at 32 VA Medical Centers with plans to reach 50 facilities by fiscal year 2023.

REMOTE TEMPERATURE MONITORING IN AMPUTATION PREVENTION THROUGH TELEHEALTH

A Veteran who develops their first diabetic foot ulcer (DFU) faces a five-year mortality rate of 43%. With 25% of Veterans suffering from diabetes, DFUs are a major concern for VA. Remote Temperature Monitoring is a joint effort between VA and Podimetrics, a virtual care management company dedicated to preventing diabetic amputation. The Practice uses the Podimetrics SmartMat, which is the only FDA-cleared remote temperature monitoring technology and has been implemented in over 3,000 patient homes. In collaboration with The Initiative to End Diabetic Limb Loss at VA (TIEDLLV), the Remote Temperature Monitoring practice has been implemented at over 90 VA Medical Centers and reported the following clinical trial data:

- 97% identification of DFUs five weeks before they would have otherwise been detected
- 86% of patients used the Podimetrics SmartMat at a clinically meaningful level for 35 weeks
- 40% reduction in emergency room visits
- 52% reduction in hospitalizations
- Near elimination of DFUs in clinical trial patients
- Zero major diabetic amputations



EMERGING TECHNOLOGY TEAM

Emerging technologies, like extended reality (XR) applications that use immersive 3D, computer generated experiences to help address post-traumatic stress disorder (PTSD), anxiety, depression, and chronic pain, are being rapidly adopted at VAMCs across the country. While new technologies carry a lot of promise, they can also pose challenges, cause uncertainty, and create hurdles in scaling successful pilots. The Diffusion of Excellence Emerging Technology Team (Emerging Tech Team) is addressing this by building supportive communities around innovation and identifying, testing, and integrating cutting-edge technologies and innovative care models to transform service delivery. Over the past year, the Emerging Tech Team has focused on navigating the ever-evolving landscape of technology innovation, digital health, and data and analytics transformation to solve some of the most pressing healthcare challenges.



EXTENDED REALITY (XR)

The Emerging Tech Team established the XR Network and Community of Practice in response to the expansive growth of XR applications ranging from rehabilitation to address phantom limb pain to prolonged exposure therapy. VA even saw its first use of XR to immerse and distract patients who require “awake” surgery, improving their overall experience under otherwise stressful circumstances. The XR Network, which includes over 100 VA sites and 400 staff members interested in XR healthcare applications, developed a repository of resources addressing everything from hardware and software guides to standing up XR-related pilots. In 2020, the XR Network launched its first multiple-site pilot at 12 VA facilities evaluating six different use cases. These facilities will assess the value of XR use for falls risk assessment, neurological assessment, pain management, anxiety, and palliative care. The pilot aims to assess the interest of Veterans and clinicians in the use of VR across multiple scenarios, better understand the technical requirements of XR use across a variety of facilities, disciplines, and healthcare settings, and build a framework for multi-site collaboration and XR-related program development.



ARCHES

The Emerging Tech team collaborated with VA Office of the Chief Technology Officer (OCTO) to launch Arches, a cloud-based data analytics environment. One aspect of this environment, MDClone, can be used to identify cohorts of interest for innovation, quality improvement or research efforts, and can generate synthetic data to catalyze collaboration more readily with multiple users.

MDClone is an analytics tool that compiles patient-oriented data, facilitates analysis without needing programming skills, and creates realistic, yet synthetic clinical datasets. Synthetic data is generated via computer model that mirrors real-world information by observing attributes of real data. MDClone allows for increased access to data to solve important problems and meet healthcare needs without the risk to Veteran privacy of using real data. MDClone is being used for COVID-19 predictive model validation and in planning stages for multiple Artificial Intelligence (AI)/machine learning (ML)-based projects related to heart disease, kidney disease, Parkinson’s Disease, suicide risk, hospital-acquired infections, hypertension, and the impact of telehealth on readmission.

CLEAN MATS

The Emerging Tech Team collaborated with VA Pittsburgh Health Care System and AIONX Antimicrobial Technologies to pilot the use of self-cleaning mats in a VA Pittsburgh Community Living Center. The goal of this collaboration was to test the utility of these mats in areas typically at high risk for contamination and infection proliferation. The cleanSURFACES™ mats feature technology that identifies and then eliminates pathogens through an electric impulse and were placed in high traffic areas such as large countertops and medicine carts. Post-installation in the areas evaluated, VA Pittsburgh saw a 94% decrease in the presence of pathogens associated with Healthcare-Associated Infections (HAIs). The Emerging Tech Team is now working with VA Pittsburgh to further disseminate and scale this type of technology.

DIGITAL HEALTH PLATFORM

Widespread adoption of smart watches, health applications, and at-home medical devices pose unbridled potential for seamless integration of minute-by-minute health data into care models. With privacy and consent as guiding principles, the Emerging Tech Team is leading the creation of a Digital Health Platform that will allow select integration of third-party health data into VA electronic health record systems. This platform will help Veterans share timely, accurate, and critical health data with their cardiologists, psychiatrists, sleep specialists and more. The Emerging Tech Team, in collaboration with OCTO, is championing multiple projects across a continuum of digital health technologies. In January, they launched a collaboration with Fitbit that is connecting Veterans with smart watches to track health metrics like electrocardiogram (EKG), blood oxygen levels (SpO2), sleep cycles, and more. The Emerging Tech team is working with Whole Health at the Atlanta VA Health Care System and other clinics across the nation to explore the integration of Fitbit data into Veteran care.

LONG COVID

Long COVID is an emergent concern for Veterans and their care teams. Loss of smell and taste, joint pains, muscle aches, fogginess, extreme fatigue, mood swings, chest pains, and changes in memory and thinking are just a few of the persistent Long COVID symptoms that people are experiencing four or more weeks after initial COVID-19 infection. Identifying symptoms and even defining the condition is challenging.

The Emerging Tech team is leveraging data and analytics to support the VHA Post COVID Clinical Interest Group, a community engaging 27 VHA facilities and over 90 direct care clinicians in learning more about the short- and long-term health effects associated with Long COVID. In the past year, the team created a prototype long COVID predictive model using AI and completed an environmental scan of 119 VHA facilities to determine the current state of clinical care for long COVID across VHA. They identified 16 current long COVID clinics, 26 sites interested in developing formal clinics, and an additional 77 who detailed current care pathways. They also conducted experience interviews with Veterans, caregivers, and VA staff to better understand the human component of the care experience. OCTO and the Emerging Tech Team are analyzing these responses with the goal of identifying and testing cutting-edge technology solutions to optimize care pathways for long COVID clinical care.

THE NATIONAL CENTERS FOR INNOVATION TO IMPACT

Healthcare is faced with three profound interrelated challenges. 1) Our rapidly growing older adult population is living with multiple co-morbidities requiring complex resource-intensive care; 2) healthcare spending in the US is growing at an extraordinary rate, surpassing \$3 trillion a year; and 3) at the same time, there is a growing deficit in the number of available providers and caregivers. Consequently, it has become apparent that the traditional approaches to care will not meet the expanding demands even if we could afford it.

The collision of these three dramatic forces will not only profoundly impact the Veteran community, but also society as a whole. As a result, we are at a critical inflection-point requiring innovative and scalable solutions to tackle these challenges. This will require the organized collaboration of experts from diverse disciplines and perspectives to deliver timely, codeveloped solutions. VHA IE National Centers for Innovation to Impact (NCI2I) aim to foster collaboration between both internal and external partners and select, local VA medical centers to address VHA’s most pressing healthcare challenges. While each center is designed to have a unique “sweet spot” in relation to VHA’s overarching challenges, the tie that binds these centers together is the collective objective to bridge VHA strategic priorities with frontline solutions that are transformational, scalable, and responsive to the needs of Veterans. This vision can only be realized through frontline-lead incubation, co-development, and testing of solutions with Veterans themselves and support from a diverse cadre of internal partners such as VA Office of Information & Technology and VHA Office of Research & Development, and external partners from academia, industry, nonprofits, and other government agencies. These partners can serve as force multipliers and will help build both the culture and capacity for innovation across VHA.

To date, VHA IE has launched three of six planned NCI2I centers: (1) National Center for Healthcare Innovation (NCCHI) at VA Palo Alto Health Care System (VAPAHCS) located in Palo Alto, California, (2) VA Ventures at VA Puget Sound Health Care System (VAPSHCS) in Seattle, Washington, and (3) VA New England Center for Innovation Excellence (NECIE) at Veterans Integrated Service Network (VISN) located in Manchester, New Hampshire.

FRONTLINE PERSPECTIVE + PARTNER COLLABORATION = DELIVERING MORE, TOGETHER



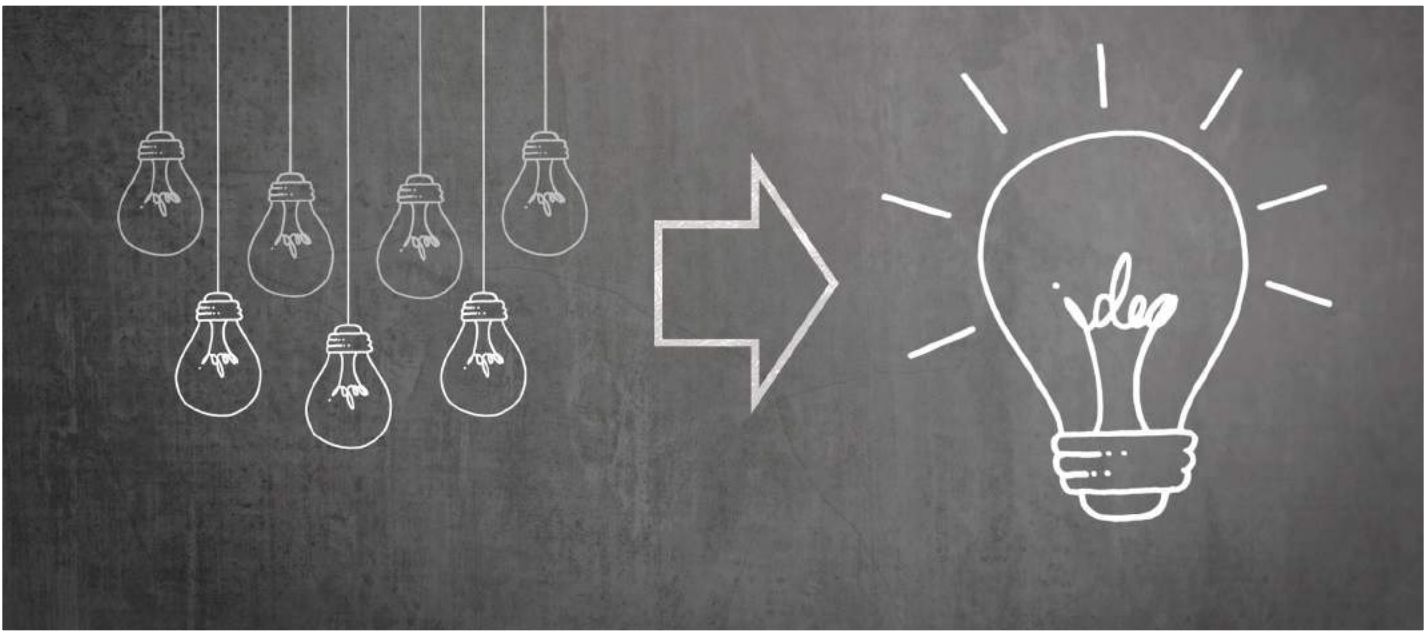
WELCOME, NEW ENGLAND CENTER FOR INNOVATION EXCELLENCE

Innovation and ingenuity have long been a part of VA’s care for Veterans. However, the mission of providing the best care for all who served cannot be carried out alone. This is especially true in the modern healthcare space, where new ideas require considerable technical knowledge and rigorous testing. That’s why VHA IE has launched VA New England Center for Innovation Excellence (NECIE), the third VHA IE National Center for Innovation to Impact, in collaboration with the VA New England Healthcare System.

NECIE provides the Innovation community with practical healthcare provider input to the development process, a natural clinical partner, and real-world patient input from the Veteran community as part of the design to accelerate “innovation to impact”. NECIE and the VHA Innovation Ecosystem are exceptionally aligned and positioned to design, develop, and broadly share positively impactful healthcare solutions.

NECIE focuses on innovations in these key areas:

- **Technology Solutions for Chronic and/or Complex Illness and Injury**
- **Rural Access to World Class Healthcare**
- **Healthcare and Lifestyle Solutions for Aging Veterans**



THE NATIONAL CENTER FOR COLLABORATIVE HEALTHCARE INNOVATION

Located in Silicon Valley, the National Center for Collaborative Healthcare Innovation (NCCHI) collaborates broadly with industry partners, other government agencies, academia, and throughout VA to create far-reaching positive impact for Veteran care. NCCHI is translating complex technologies from the research bench to the clinical bedside.

NCCHI OBJECTIVES

- Act as a catalyst to enhance Veteran care through collaboration
- Transform illness to wellness
- Help build the healthcare system of the future



SMART WHITE CANE FOR THE BLIND

The traditional “white cane”, for the visually impaired, has not significantly changed in the last 100 years– until now. NCCHI is collaborating closely with Brian Higgins, a Blind Rehab Specialist at VA Palo Alto’s Western Blind Rehab Center, in the development of an advanced “smart cane” with sensors, such as LIDAR and ultrasound, connected to feedback tools such as sound and haptics. This breakthrough invention is designed for increased freedom, safety, and independence through technologically enhanced mobility and navigation.



FALL PREVENTION

The average yearly cost of fatal and non-fatal falls in the U.S. is approximately \$50 billion – a staggering cost for potentially preventable injury and disability. In collaboration with the medical company Palarum, NCCHI has designed and implemented a novel solution to utilize their smart sensor sock system to immediately detect and alert nurses when a fall-risk patient attempts to get out of bed. The system is optimized for efficient clinical response, empowering nurses to be in the right place, at the right time to prevent patient falls.



VIRTUAL REALITY

The NCCHI team has identified multiple ways to leverage virtual reality (VR) to enhance care. In collaboration with Innovation Specialist, Caitlin Rawlins, at Ashville VA Medical Center, they have quantified and published the benefits of VR to reduce Pain and Anxiety. They are also leveraging VR at Palo Alto for surgical procedural reduction pain and anxiety as well as with different teams for nursing employee wellness. Finally, NCCHI is also collaborating with Buffalo VA Medical Center on the use of VR for visual rehabilitation.



COVID OPERATIONAL READINESS

COVID-19 has emphasized the need for advanced staffing coordination, planning, and efficiency. In collaboration with the company Issio, the NCCHI team has implemented a cloud-based system that has connected over two thousand nurses. The recent addition of predictive analytics can increase productivity and support workforce optimization.



ADVANCED ANALYTICS

Dr. Osborne and his team at NCCHI have worked to leverage the VA Electronic Health Record and cutting-edge analytics (such as artificial intelligence) to uncover clinical insights and understandings for some of the most pressing Veteran challenges. They have empowered our caregivers with advanced healthcare system knowledge of COVID-19, surgical care, neurodegenerative disease, acute kidney injury, prostate cancer, and departmental efficiency.



AUGMENTED REALITY AND 5G

Project CONVERGENCE brings “science fiction to life” through its cutting-edge 5G and augmented reality program. NCCHI has created one of the first 5G-enabled hospitals in the world at our home base at VA Palo Alto Health Care System. This collaboration brings cutting-edge wireless healthcare solutions, including augmented reality for clinical training, presurgical planning and operative guidance. The collaboration includes 5G wireless connectivity from Verizon, clinical augmented reality software from Medivis, and HoloLens 2 headsets and engineering from Microsoft.

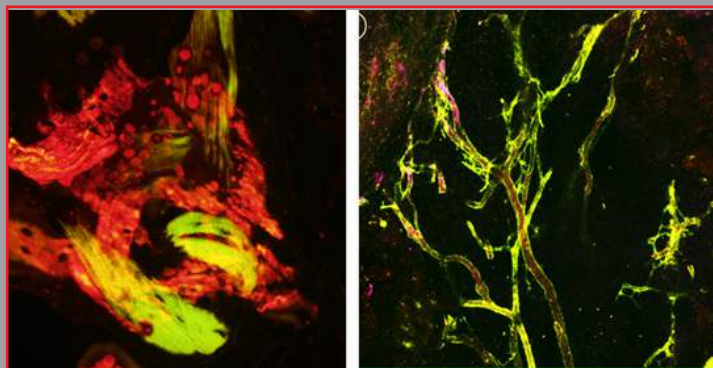
VA VENTURES

VA Ventures is an innovation incubator designed to promote early collaboration between VA, academia, start-ups and industry. Ventures works with a diverse network of partners to identify, develop, and promote rapid commercialization of innovative solutions. Currently, efforts are focused on 3D and bioprinting, and will expand to artificial intelligence and machine learning, robotics, augmented and virtual reality, and rural access.

VA Ventures seeks to bolster technology that directly impacts VHA's ability to care for Veterans. One of Ventures' focus areas, for example, is driven by VHA surgeons' needs for a viable alternative to existing bone graft options. Bones grafts are used to replace a piece of a patient's bone that is lost to trauma, infection or a tumor. Bone grafts from natural sources are in limited supply, can fail, and can lead to long healing times when sourced from the patient. Synthetic bone grafts also have compatibility risks that limit their use in larger bone defects. The solution? Creating living, vascularized bone.

FOCUS AREAS

- 3D and Bioprinting
- Artificial Intelligence and Machine Learning (imaging)
- Immersive Technology (Augmented Reality/Virtual Reality)
- Robotics
- Rural Access

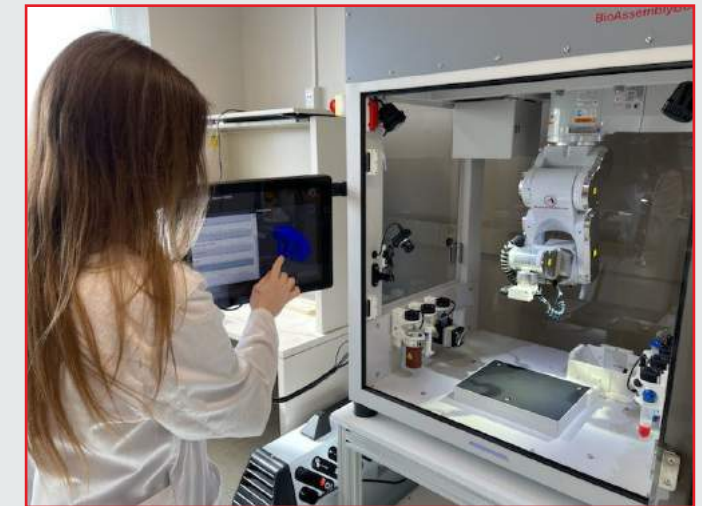


BIOFABRICATION COMMUNITY OF SCIENCE

VA Ventures and VA's Office of Research and Development collaborated to establish the Biofabrication Community of Science (CoS), a network of researchers, innovators, clinicians, engineers, and other staff members developing an integrated infrastructure to provide Veterans with customized biofabricated solutions. Biofabrication is the process of using bioengineering principles with biological materials and cells to manufacture constructs for medical applications; for example, using bioprinting and bioassembly to repair, replace, or treat damaged or diseased tissues. The CoS is building a robust network of internal and external stakeholders across the biofabrication continuum to learn, ideate, research, and build solutions for Veterans. Aligned with this goal, CoS will be holding the first annual Biofabrication symposium to convene and knowledge-share with experts in the field. The CoS is also pioneering a set of practices and resources to develop biofabricated solutions across every stage of the development process. Current efforts at VA are focused on biofabricating muscle, nerve, vessels, and bone – and are even expanding to other complex tissues, like lungs and cornea. VA innovators believe this technology may one day close the growing gap between supply and demand for organs and tissues.

BIOBONE

VA Ventures is leading the BIOBONE project in collaboration with Advanced Solutions Life Sciences, which lays the foundation for fabricating patient-matched living grafts for bone repair. BIOBONE grafts bring all the advantages of current solutions to the medical field: patient autologous cells, compatibility, no extra surgeries, and on demand manufacturing. BIOBONE will serve as a source of "ready to go" 3D printed bone grafts by creating a dedicated clean room space within VA hospitals. The space will be equipped with an automated workflow comprising a bioprinter to manufacture living bone grafts, an enclosed confocal microscope to validate them, and a bio-storage solution to cultivate patients' cells and incubate the grafts until their "ready to use" day. Ultimately, the BIOBONE project aims to 3D print customized living bone tissues for any Veteran in need within VAMCs.



VHA POWERED AIR PURIFYING RESPIRATOR (PAPR) HOOD

VA Ventures team members developed a universal Powered Air Purifying Respirator (PAPR) hood to protect healthcare providers and patients from exposure to infectious disease. The hood is uniquely interchangeable across multiple types of respirator systems and is designed with improved cleanability and materials sourced primarily from US-based manufacturing to accommodate the national supply chain crisis caused by COVID-19. In support of VA Ventures' local community, 100 hoods were delivered to VA Puget Sound Health Care System and a license agreement with a regional hospital supplier provides a pathway for healthcare systems across the Pacific Northwest to obtain this product, should the supply chain falter again.



The Ventures team filed a provisional patent for the PAPR hood and collaborated with Dr. Jennifer DeLaney and Washington University in St. Louis to develop a full PAPR system to help fulfill VA's Fourth Mission of supporting the US healthcare system in times of national emergency. The PAPR system received Public Health Emergency approval from the National Institute for Occupational Safety and Health and is listed on the Center for Disease Control's certified equipment list. Dr. DeLaney's business, PAPR Force, is deploying these PAPR systems (VA hood, collaborator respirator) around the world, including 250 to India, Africa, and South America.

NEW ENGLAND CENTER FOR INNOVATION EXCELLENCE

The New England Center for Innovative Excellence (NECIE), located in Manchester, New Hampshire, focuses on sourcing and implementing technology solutions for chronic illnesses and injuries, improving accessibility for rural Veterans, and providing innovative healthcare solutions for VA's aging population. In just seven months, NECIE, has served as conduit to launching life-altering innovations that are increasing care and quality of life for our Nation's Veterans. NECIE is delivering cutting-edge care to Veterans with projects like the Rideshare Project and IBOT, which are mobilizing homeless Veterans for greater Access to Care and offering new independence for disabled Veterans.

FOCUS AREAS

- Technology Solutions for Chronic and/or Complex Illness or Injury
- Rural Access
- Solutions for Aging populations



IBOT PERSONAL MOBILITY DEVICE

Walking up a flight of stairs or taking a photo standing eye-level with loved ones are just two of the small moments that many able-bodied Americans take for granted. NECIE is striving to restore these moments for disabled Veterans and improve quality of life through the iBOT Personal Mobility Device (iBOT PMD).

The iBOT PMD is allowing NECIE to transform the way disabled Veterans interact with the world. The device, also called the "ATV of robotic wheelchairs," enables disabled Veterans to navigate various terrains – stairs, snow, ice, sand, gravel, and more. This new device offers Veterans new levels of mobility in previously inaccessible environments.

NECIE is leading a collaborative project with Mobius Mobility LLC to deliver iBOT PMDs to each of the 25 VA Spinal Cord Injury and Disability (SCI/D) Center Hubs for training and demonstration purposes. Veterans across the nation will benefit from a donation of 50 iBOT PMDs. The NECIE team is excited to facilitate meaningful experiences with the iBOT, like the one delivered to a father returning from deployment, who was able to 'walk' his daughter down the aisle.



THE RIDESHARE PROJECT

Transportation can be a major barrier to care for Veterans experiencing homelessness. NECIE is committed to removing this barrier by providing rideshare services for VHA Homeless Programs. Since August 2021, The Rideshare Project has enabled NECIE to facilitate more than 75,000 miles in rides, or 1,250 hours in travel, for our Nation's Veterans to begin breaking down these barriers. These miles are impactful because they translate to life-altering access to housing, employment, food, and community services for our Veterans experiencing homelessness.

The NECIE Rideshare project enables VHA Homeless Program staff to efficiently deliver whole health support for the Veterans that need it the most. This past year, the program provided Veterans within the



VHA Homeless Program with rideshare services to nearly 2,300 medical appointments and connected 203 unique Veterans with potential employment opportunities. NECIE's Rideshare Project also helped a Veteran avoid eviction by coordinating transportation to a vaccination appointment for their support animal.

The project has also been deployed during times of crises, such as the successful evacuation of Veterans from Southeast Louisiana when Hurricane Ida made landfall this fall and the emergency evacuation of Veterans from facilities during raging wildfires in the Northwest. To further efforts for emergent needs, NECIE is now looking to expand the rideshare concept to Veterans eligible for the COVID-19 vaccination and booster shots. The Rideshare Project is breaking down barriers to housing and health services through transportation, empowering Veterans with access and a sense of independence.

"Since its implementation in August 2021, VA staff and our Veterans have praised the Rideshare Program for its ability to empower Veterans, allowing them a higher level of independence that was not there before. The benefits of the program go beyond rides to medical appointments or to meet a landlord. Rideshare offers the opportunity for the Veterans to address their needs holistically and return to some sense of normalcy. Our hope for the future is to see homeless staff become more comfortable using the program as a day-to-day resource as well as expanding the Rideshare program drivers' stock to address the needs of our Veterans in rural areas."

Bill Cress, LCSW
VISN 4 Network Homeless Coordinator,
Pittsburgh, PA



THANK YOU NATIONAL CENTERS FOR INNOVATION TO IMPACT TEAMS



NCCHI INNOVATION TEAM



Lisa M. Howard
Director, VAPAHCS
Executive Sponsor
innovation superpower: vision



David Arreola, MCSE
Technology Integration Specialist
innovation superpower: resolution



Michael Kozal, M.D.
COS VAPAHCS
Executive Sponsor
innovation superpower: experience



Ilya Vrublevskiy, PMP
Project Manager
innovation superpower: persistence



Thomas Osborne, M.D.
Director, NCCHI
innovation superpower: grit



Kayln Essex, M.P.A.
Innovation Specialist
innovation superpower: balance



Paola Suarez, M.P.H.
Data Scientist
innovation superpower: perseverance



Zach Veigulis, M.S.
Data Scientist
innovation superpower: ingenuity

VA VENTURES INNOVATION TEAM



Kathryn Sherrill
Deputy Director VA Puget Sound HCS
Executive Sponsor
innovation superpower: operations



Beth Ripley, M.D., Ph.D.
Deputy Chief Officer, VHA OHIL
innovation superpower: vision



Brian Strzelecki
Director of Quality
innovation superpower: resourcefulness



Arrianna Willis
Director of Operations
innovation superpower: systems thinking



Chris Richburg
Director of Teams
innovation superpower: bringing order to chaos



Joseph Iaquinto, Ph.D.
Director of Research & Development and Crisis Operations
innovation superpower: vivacious



Dmitry Levin
Director of Clinical 3D Printing
innovation superpower: tenacity



Ryan Vezeau
Administrative Officer
innovation superpower: cold-hearted logic

NECIE INNOVATION TEAM



Ryan Lilly, M.P.A.
Network Director, VA New England Healthcare System
Executive Sponsor
innovation superpower: moxie



Lisa Doyon, M.B.A., M.S.M.L.
Director, VISN 1 VA New England Healthcare System Performance Improvement
innovation superpower: inspiration



Leandro DaSilva
Acting Director, NECIE
innovation superpower: versatility



Stacey Lewis
Data Scientist, NECIE
innovation superpower: inquisitive



Kristin Pressly
Public Affair Officer, NECIE and VAMC Manchester
innovation superpower: communication



Charles Franklin
Project Manager, NECIE
innovation superpower: heart

“ALONE WE CAN
DO SO LITTLE,
TOGETHER WE CAN
DO SO MUCH.”
—HELEN KELLER

A YEAR OF SimLEARN



Healthcare providers face many day-to-day challenges that can often be mitigated by proper training. Take, for example, preventable harm caused by poor quality cardiopulmonary resuscitation (CPR). With over 290,000 annual adult in-hospital cardiac arrests, proper CPR techniques can save lives. The Simulation Learning, Evaluation, Assessment and Research Network (SimLEARN) national program office is addressing these needs at VHA by providing training solutions to equip local facilities with the tools and resources to deliver quality, simulation training programs that contribute to the advancement and innovation of VHA healthcare. SimLEARN provides staff with immersive training experiences – building simulated environments that are as close as possible to an actual clinical situation without placing our patients at risk. The program office also supports VHA's journey as a high reliability and learning organization through the coordination of all national VHA simulation-based clinical education products and activities supporting enterprise level innovative healthcare solutions. Over the past year, SimLEARN accelerated the adoption of emerging health technology through simulation and learning, assessing the technology landscape, and identifying solutions that advance the standard of clinical learning and simulation.

As of October 1, 2020, SimLEARN was organizationally realigned to VHA Office of Healthcare Innovation and Learning (OHIL) as a sister organization to VHA Innovation Ecosystem (VHA IE) under VHA Office of Discovery, Education, and Affiliate Networks. SimLEARN continues to collaborate with VHA IE to explore cutting-edge technology that can be implemented into VHA simulation labs and medical facilities. As part of the VHA OHIL family, SimLEARN is positioning itself as a testing site for innovative technologies and practices for validation through simulation to address educational challenges in the simulation healthcare industry.

SIMLEARN LEADERSHIP



Eric Bruns, M.B.A.
Executive Director, Simulation Learning,
Evaluation, Assessment & Research Network (SimLEARN)
innovation superpower: calmly impactful



Scott Wiltz, M.D., M.P.H., FFAFP
Medical Director, Simulation Learning,
Evaluation, Assessment & Research Network (SimLEARN)
innovation superpower: wordsmithing



Lisa Baker, R.N., B.S.N., M.Ed.
Director, Clinical Learning and Innovation
innovation superpower: tenacity

CURRENT SIMLEARN INITIATIVES INCLUDE:

RESUSCITATION SIMULATION SYSTEM TESTING

The Resuscitation Education and Innovation (REdI) program ensures that resuscitation training is standardized across VHA and equips employees with the right tools, processes and technologies to respond during a medical emergency. REdI provides focused, quality reviews through Resuscitation Simulation System Testing (RSST), which reviews facility data and tests the process through a simulation-based strategy to identify and mitigate potential hazards related to the medical emergency response and ensure VHA has emergency response capability to manage cardiac arrests on VHA property.

ELECTRONIC HEALTH RECORDS

Electronic Health Records modernization (EHRM) leads to new user interfaces and processes that are challenging for new and long-time users to adapt to. SimLEARN is supporting frontline staff in clinical and non-clinical roles that have struggled to implement changes required for using the new EHR. SimLEARN is leveraging its expertise in experiential learning, testing and validation of clinical performance and innovation for new behaviors and processes to address the lack of hands-on, end-to-end experience.

CONSTRUCTION FACILITIES MANAGEMENT

In June, SimLEARN, in collaboration with the Office of Facilities Standards Service and the Office of Construction and Facilities Management, leveraged its expertise in Simulation-based Hospital Design Testing (SbHDT) to validate designs prior to the start of construction and avoid corrective costs. SbHDT uses common and high-risk clinical scenarios to determine if a room's configuration can accommodate a variety of staff configurates, equipment and workflows to effectively meet the needs of clinical staff providing care to Veterans. SimLEARN created a full-scale mock-up of multiple treatment areas along with developmental equipment and supplies from the new Emergency Services Design Guide to inform significant changes in layout, emergency equipment placement, and orientation of beds in a room.

SimLEARN aims to set the standard for healthcare with reliable, relevant, and data driven simulation-based clinical education and tools, robust assessment and research that add enterprise-wide impact and value. As an indispensable asset to the enterprise and its collaborators, SimLEARN strives to provide world class services to all Veterans through innovation and simulation education. SimLEARN's current and future programs will continue to improve staff member readiness for various healthcare scenarios, ensuring Veterans receive safe and reliable care, every time.

CURRENT SimLEARN INITIATIVES



HIGH-TECHNOLOGY, IMMERSIVE ENVIRONMENT FOR TRAIN-THE-TRAINER ACTIVITIES



OPERATIONAL HUB FOR COORDINATION FOR NATIONAL VHA CLINICAL SIMULATION



CRITICAL TRAINING SUPPORT FOR MEDICAL CENTER CLINICAL AND NON-CLINICAL EMPLOYEE FIELD TRAINING



STANDARDIZATION OF BEST PRACTICES FOR IMPROVED QUALITY, OPPORTUNITIES FOR INNOVATION, AND NETWORKING

WELCOME, CENTER FOR CARE AND PAYMENT INNOVATION!

On June 6, 2018, the President of the United States signed the VA Maintaining Internal Systems and Strengthening Integrated Outside Networks (MISSION) Act of 2018 into law, thereby establishing the Center for Care and Payment Innovation (CCPI) under section 152. Since then, CCPI has been collaborating with VA program offices and the healthcare industry to develop and test innovative approaches to payment and service delivery models. CCPI aims to reduce the cost of care, while preserving or enhancing the quality of care provided to Veterans.

As the healthcare landscape resituates and undergoes several changes post-COVID, CCPI is uniquely able to support VA in reemerging as a healthcare leader. In order to test innovative models of care and payment, the MISSION Act authorizes CCPI to submit proposals to the VA Secretary waiving statutes that govern Veterans' benefits related to hospital, nursing home, domiciliary, and medical care. Subject to Congressional approval and reporting, this waiver authority positions CCPI to accelerate VA's move towards sustainable, value-based healthcare transformation – with Veterans at the center.

Figure 1. CCPI Pilot Lifecycle



As of April 1, 2021, CCPI has been organizationally realigned to VHA Office of Healthcare Innovation and Learning (OHIL) as a sister organization to VHA Innovation Ecosystem (VHA IE) under VHA Office of Discovery, Education, and Affiliate Networks. This realignment provides an avenue to tie care and payment innovation pilots more closely to the broader VHA OHIL innovation portfolio and allows for improved oversight by the VHA Governance Board, ensuring that selected pilots meet the needs of the organization. CCPI is currently evaluating several pilot program concepts targeting important Veteran needs, such as improved coordination and utilization of emergency care; integration of Whole Health patient-centered care principles to address opioid use; and leveraging telehealth, advanced case management, and contracting models to improve care delivery and realize efficiencies. VHA OHIL is excited to welcome CCPI and looks forward to future collaborations in the development of innovative payment and care delivery models.

PILOT SPOTLIGHTS

VETSMILE

VETSmile is the first waiver request and pilot program submitted to Congress by CCPI. Through VETSmile, CCPI is connecting VHA-enrolled Veterans (who are not eligible for dental benefits through VA) to comprehensive, state of the art, free and discounted dental services at New York University (NYU) College of Dentistry and Zufall Health Center in northern New Jersey. The two initial pilot sites will serve approximately 2,700 Veterans, including 6,000 patient visits in the first year. VETSmile aims to improve Veteran access to dental services for continuous, accessible, and affordable oral healthcare, which will also improve overall wellbeing. During this pilot program, CCPI will evaluate opportunities to expand to additional geographic areas.



MEDICAL FOSTER HOMES

In collaboration with the Office of Geriatrics and Extended Care, CCPI is pursuing a waiver allowing VA to pay for Veterans to receive care in Medical Foster Homes as an alternative to institutionalized care settings (i.e., nursing homes). VA's Medical Foster Home Program provides community-based residential homes that serve Veterans who are unable to live independently due to functional, cognitive, or psychosocial impairment resulting from conditions such as complex chronic disease, psychological disorder, spinal cord injury, or polytrauma. By improving access to Medical Foster Homes, CCPI aims to honor Veterans' preferences to age in the community at home, provide Veterans with more individualized, high-quality care, reduce avoidable hospitalizations, and reduce unnecessary costs to VA.



CCPI LEADERSHIP



Roshni Ghosh, M.D., M.P.H.
Executive Director
Center for Care and Payment Innovation
innovation superpower: transformer

BREAKING BOUNDARIES

“IF YOU WANT TO GO FAST, GO ALONE. IF YOU WANT TO FAR, GO TOGETHER.”

-AFRICAN PROVERB

WE ARE BREAKING BOUNDARIES.

When people hear innovation, they often think amazing or groundbreaking new technology. While technology plays an important role, it is not the centerpiece of innovation. Transformative innovation is about breaking the boundaries that confine us, the institutional and operational silos that constrain our ability to collaborate. Transformative innovation is about looking outside ourselves, building communities, and learning together how to approach problems in new ways.

This past year, the VHA Office of Healthcare Innovation and Learning has taken a strategic approach to breaking boundaries in the form of three nationwide initiatives we'd like to share with you in this segment of the report. In the next few pages, we'll show you the Community Engagement Offerings Menus and Innovation Pathfinder that act as a “front door to innovation”, the Reimaging Veteran Care Initiative that aims to design solutions for a more diverse and inclusive VA, and the Advanced Manufacturing Initiative that offers a pipeline to source problems, embrace ideas, leverage innovative capabilities in 3D printing, and offers a manufacturing and regulatory infrastructure to enable the delivery of clinical and economic value for VA and Veterans in real time.

To build these solutions and enable these initiatives, we connected deeply with communities across all sectors of academia, industry, nonprofit, other government agencies and Veteran Service Organizations. We met with stakeholders in board rooms, virtual meeting rooms, clinics, in Veterans' communities and in their homes. During these meetings we listened empathetically and approached everyone as a ‘customer of innovation’. Through this, we sought to better understand the challenges they face, the goals that drive them, and what matters most to them in this changing world. From this, we are developing multiple solutions to better serve these communities as customers, and in turn, to create a more innovative and collaborative VA.

Throughout this piece, you'll have the opportunity to meet the customers of innovation, explore what we learned, and see the solutions we are introducing this fall. I hope you see yourself represented as a customer of innovation here and are inspired by the opportunity that awaits you.

**--Suzanne Shirley, LCSW
Director, Community Engagement & Fellowship**

VHA IE COMMUNITY DISCOVERY

DEVELOPING EMPATHY FOR OUR STAKEHOLDERS AND INNOVATION CUSTOMERS

VA is the largest integrated health care system in the US and its employees work tirelessly to deliver the best possible care to our Nation's Veterans. But VA cannot innovate alone. To us, breaking boundaries isn't just thinking outside the box; it's closing our eyes and reimagining what it means to be innovative.

This year, the VHA IE Community Engagement team set out on a HCD journey that put the customers of innovation at the center of our mission to change and save Veteran lives. This meant tapping a diverse group of customers from all corners of the ecosystem to determine what it means to innovate with VA, how to make the process more accessible, and how we can design and deliver our offerings and resources to empower internal and external innovators.

We heard stories from over 100 such innovation customers. By personally connecting with our customers to pinpoint their needs and challenges, we were able to design a slate of transformative innovation offerings.

Here's a roadmap of our customer discovery, including who we engaged, what we learned, and how we're incorporating customer feedback in the design of VHA IE Community Engagement strategies.

1

PUBLIC & PRIVATE SECTOR DISCOVERY

In the fall of 2020, we spoke with 41 external entities, including startups, large firms, non-profits, academia, other government agencies, and Veteran Service Organizations. We wanted to learn more about their needs as we strive to make innovation accessible for all customers who are interested in serving Veterans. We found that external innovators need help at all stages of the innovation lifecycle: discover; test; replicate; scale.

2

VA FIELD DISCOVERY

In the winter of 2020, spoke with 33 frontline staff, clinicians, and researchers to better understand how our innovation toolkit is currently serving them, and how we could design our products with their unique needs in mind. We wanted to learn more about how innovative solutions enable them to provide more seamless and empathetic care, and how VHA IE can enhance VA's reputation as a learning organization.

HEAR MORE FROM OUR CUSTOMERS...



"The Elizabeth Dole Foundation is fortunate to continue working alongside VA to transform the Veteran caregiver space. In the last year, we have reached over 1600 Veteran caregivers through our innovative Respite Relief program. This program provides caregivers compassionate and needed relief during this stressful time. We encourage all eligible caregivers to take advantage of the Respite Relief Program, which is available nationally."

- **Rashi Venkataraman Romanoff**
Vice President For Programs & Partnerships
The Elizabeth Dole Foundation

"Our partners at VA have given us thoughtful feedback that helped us adapt our audio-based solutions to best meet Veteran needs. We've moved through the process quicker than expected and have had clear communication along the way. Our team has worked cross-functionally with IE leaders, Office of Information and Technology designers, field investigators, and clinicians through our work with the Escreening team and Saul Weiner's multisite pilot, Contextualizing Care. We're confident that this collaboration will help us improve our offering and enable us to deliver value in VA and across other enterprises."



- **Shiv Rao, M.D.**
Co-Founder and CEO
Abridge

3

VA LEADERSHIP DISCOVERY

In the spring of 2021, we spoke with 32 administrative and clinical leaders across VA. We learned about their priorities, experiences with innovation, and how VHA IE can best serve their organizations. From these listening sessions, we developed a Program Office and Field Leader Offerings Menu.

WHAT COMES NEXT?

With our wealth of customer insights, we will continue to iterate on new offerings for our innovation customers. In the spring of 2021, we are targeting the launch of a new slate of engagement solutions to make innovation more accessible for internal and external customers.

Up next, read more about our newly designed products and services, the Innovation Pathfinder and Program Officer and Field Leader Offerings Menu.

VHA IE COMMUNITY DISCOVERY

THE INNOVATION PATHFINDER

The Innovation Pathfinder (Pathfinder) is an online interactive tool that allows potential internal and external innovators to connect with VHA Innovation Ecosystem early and easily. We built our prototype based on insights gathered during our community discovery work.

The Pathfinder empowers internal and external innovators and serves as a starting point to explore the following offerings:



IDEA DEVELOPMENT



INNOVATIVE PRODUCTS



RESOURCES & EXPERTISE



GETTING INVOLVED

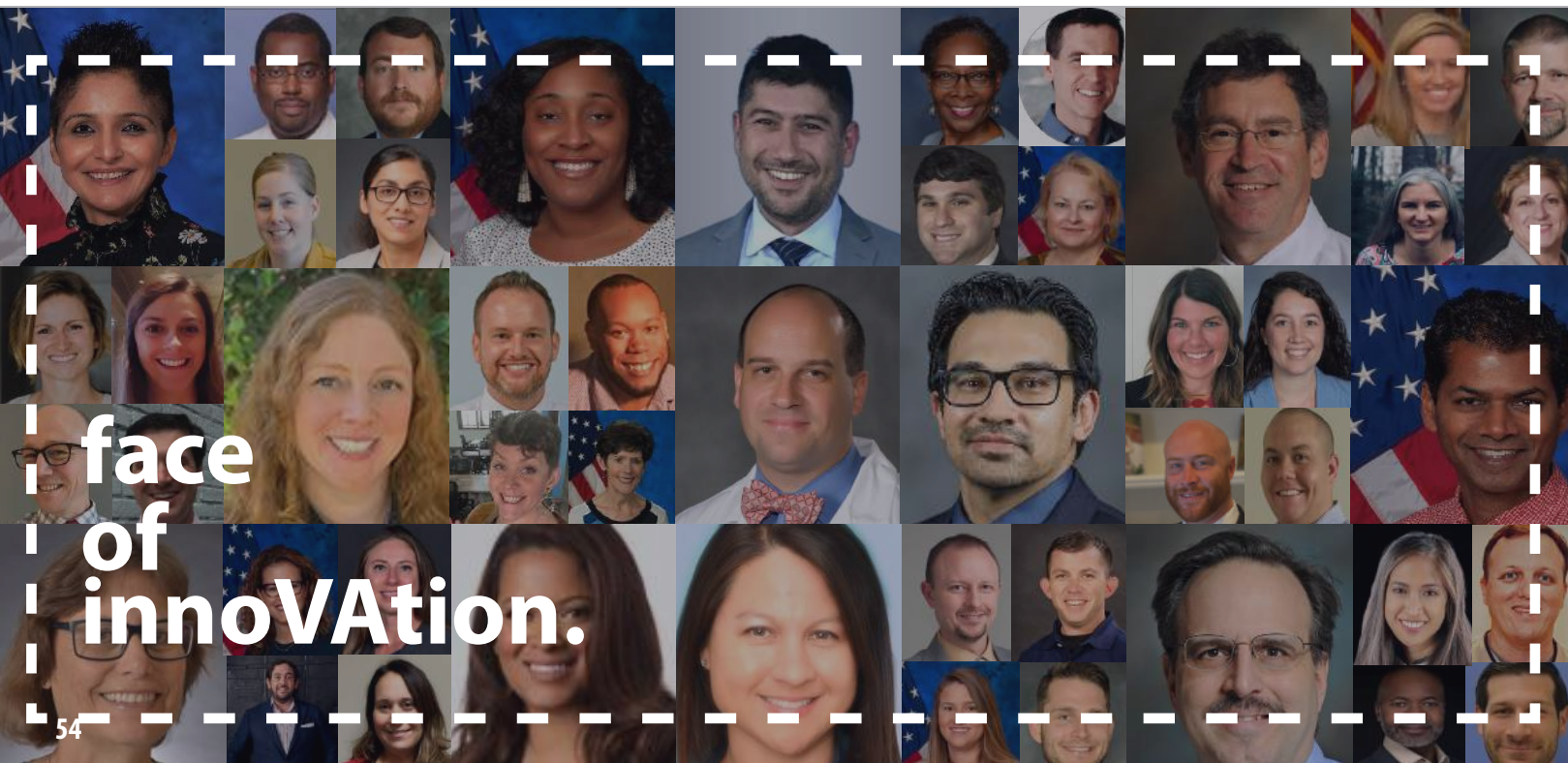


RESEARCH & ACADEMIC ACTIVITIES

As a part of our human centered design process, VHA IE continues to test and refine the Pathfinder prototype through a series of co-design sessions with the same set of internal and external innovators that informed the tool's design. This helps us ensure that the solution we launch is a customer-centric solution based on customer feedback and ideas.

You may be asking “When and how do I use the Innovation Pathfinder?” Once the Pathfinder tool is made available for broad use, innovators from within VA and outside VA will be able to find their own path by answering a short series of questions that will direct them to the best opportunities to innovate with VA.

We are pleased to announce the Innovation Pathfinder will be launching in 2022.



face
of
innoVAtion.

VHA IE PROGRAM OFFICE AND FIELD LEADER OFFERINGS MENU

Earlier this year, Suzanne Shirley, Director of Community Engagement and Fellowship, embarked on a journey to learn about the innovation health of the organization. In collaboration with the Quality Enhancement Research Initiative of VHA Health Services Research and Development Service (QUERI HSR&D) out of the Durham VA Medical Center, she led listening sessions with a diverse group of 20+ national program office leaders.

As a result of these listening sessions, we developed a set of innovation engagement offerings for Program Office and Field Leaders. The offerings are presented in a comprehensive yet straightforward menu that meets leaders where they are in their innovation journey with customized combinations of VHA IE expertise, services and products.

INNOVATION CONSULT OFFERINGS MENU:



DESIGN THINKING CONSULT

Work with experienced innovators to assess a specific problem with an empathetic and customer-centric lens.



OPERATIONALIZE YOUR INNOVATION

Provides navigational leadership in securing funding, empowering clinical champions, engaging program office partners, facilitating clinical pilots and real-time evaluation.



HUMAN CENTERED DESIGN (HCD) TRAINING

Provide your teams with the opportunity to learn innovation concepts through in-depth and accredited design workshops facilitated by IE staff.



INNOVATION TALENT SHARING

Allows the opportunity for an Innovation Specialist to join a Program Office or Network Director in co-designing a specific project or defined initiative of that office. These assignments can occur for up to 120 days.



PITCH PRACTICE

Practice pitching to a team of VHA IE experts and receive feedback on how to better articulate a defined problem, solution and value proposition.

ADDITIONAL WAYS TO ENGAGE WITH VHA OHIL/IE COMMUNITY:



JOIN AN INITIATIVE

Join a VHA OHIL Initiative topics such as Digital Health Innovation, Electronic Health Record, Advanced Manufacturing, Immersive Technology for Enhanced Care Delivery, or Data Transformation.



VHA IE PROGRAMMING AND EVENTS

Participate in the innovation lifecycle through our Innovators Network and Diffusion of Excellence programming (Spark-Seed-Spread, Bootcamp, Shark Tank, Diffusion Academy) or IE events (Innovation Experience, Hackathons, Makeathons, Challenges).



VHA IE FELLOWSHIP

Serve as a senior mentor or thought partner to one of our dedicated Innovation Fellows.

JOIN A COMMUNITY OF PRACTICE

Join a Diffusion Community of Practice around emerging health topics such as Immersive Technology, 3D Printing, Data Transformation, Precision Medicine, etc.



VHA Innovation Ecosystem

PROGRAM OFFICE AND FIELD LEADER OFFERINGS IN ACTION



VA CENTER FOR DEVELOPMENT AND CIVIC ENGAGEMENT INNOVATION ACADEMY

In 2020, the VA Center for Development and Civic Engagement (VA CDCE) was thinking creatively about engaging volunteers in new ways. Given the limitations on in-person civic service engagements at medical centers across the country imposed by the COVID-19 Pandemic, VA CDCE quickly realized they would need to rethink how to engage volunteers and design innovative solutions for a changing world. At the same time, VA CDCE identified as a strategic priority to involve youth and students in active service opportunities on behalf of Veterans. The significance goes beyond instilling a sense of civic responsibility; these young people represent the next generation of public service employees as well as what we understand to be an increasingly diverse population. VA CDCE Director Sabrina Clark reached out to Suzanne Shirley, Director of Community Engagement and Fellowship, to explore collaborative opportunities. Together, Sabrina and Suzanne sought to design a solution that would deliver impactful ways of engaging student volunteers in making VA a more open, welcoming and inclusive environment for generations to come.

The result is a one-of-a-kind program called VA CDCE Innovation Academy. VA CDCE and IE established this offering through a formal collaboration with NAF, a national nonprofit bringing together education, business and community leaders to transform the high school experience, to provide opportunities for high school students to design solutions to specific VA challenges. Over 100 students are now participating in the VA CDCE Innovation Academy, designing solutions to VA challenges and guided by VA CDCE Program Managers

and Innovation Specialists on-site in Milwaukee, Buffalo and Providence VA Medical Centers. Students are being coached and receiving feedback on their projects through a cross-functional approach to discovery, subject matter expertise input and mentorship. As the problem cycles in each location close later this year, student teams will have the opportunity to pitch their solutions to an audience of executives from VA, NAF and within their communities. Selected teams will have a chance to test their solutions within their local VA Medical Center in the Spring of 2022 and be highlighted as a part of the 2022 Innovation Experience.



“VA CDCE is proud to be collaborating with VHA IE in the development and implementation of the Innovation Academy for high school students and teachers. Not only does it represent a unique learning opportunity for problem solving and innovation, but it shines a very positive spotlight on VA. This program also serves as a mechanism for career exploration and a potential talent pipeline for the next generation of VHA employees, volunteers, or simply advocates who care about the health and well being of Veterans. It’s never too early to start that awareness building campaign.”



SABRINA C. CLARK, Ph.D.
Director
VA Center for Development & Civic Engagement



OFFICE OF CONNECTED CARE, REMOTE PATIENT MONITORING DESIGN

In March, we spoke with Dr. Kevin Galpin, VHA Telehealth Services Director under the VHA Office of Connected Care (OCC), as a part of our Innovation Discovery with VHA Program Office leaders.

He shared a concept of using cross-disciplinary project teams to achieve short-term goals within a Program Office with our Community Engagement team. He had seen this model drive success with initiatives in OCC. Dr. Galpin’s model provided us with the idea to operationalize innovation talent sharing and immersion opportunities across VA by leveraging VHA IE’s Innovation Specialists across the Nation. With Dr. Galpin’s current need to develop a national strategy for Remote Patient Monitoring (RPM), VHA IE convened internally to examine how their expertise and resources could best meet this need to drive impact, explore challenges, and build solutions collaboratively.

VHA IE selected Dr. Lindsay Riegler, Research Speech-Language Pathologist, Innovation Specialist, and Certified Brain Injury Specialist at the Cincinnati VAMC, to join OCC in designing the RPM framework of the future. Dr. Riegler was an essential member of The Initiative to End Diabetic Limb Loss at VA with a history of utilizing telehealth modalities in her research and clinical care. Dr. Riegler recognized the need for clinician workload capture for successful national scaling of remote temperature monitoring and sought VISN 10 pilot approval for Store and Forward workload capture. Following the successful pilot, Riegler worked with OCC’s Sara Derycke, Asynchronous Telehealth Lead, to ensure enterprise-wide implementation of new RPM stop codes. These changes ensured that the correct procedures and incentives were in place as telehealth utilization boomed during the COVID-19 pandemic.

Dr. Riegler will continue to work alongside key stakeholders in the VHA Office of Connected Care to co-design the RPM framework of the future. We at VHA IE are proud to call Dr. Riegler a champion of employee-driven innovation and look forward to this new chapter of VHA innovation in the field of RPM.

“Continuing my work in remote patient monitoring at the national level alongside Dr. Galpin and VA Telehealth Services not only advances my professional development as an innovator and clinician; it provides exposure to new challenges and the opportunity to design new care models for Veterans. Forging relationships between program offices to create new pathways of care is something I didn’t envision when I began at the Cincinnati VA as a Speech-Language Pathologist 14 years ago. Providing an objective lens on problem discovery has led to unbiased input and has been well received across program offices. As a practicing clinician, I’m in the unique position of serving as an intermediate lifeline from the field back to the program office. An important lesson thus far has been to remain transparent while breaking down operational barriers; the work we are doing now, is quite literally, breaking boundaries to transform healthcare for our Veterans.”



LINDSAY RIEGLER, VHA CIN
Innovation Specialist & Research SLP
Cincinnati Veterans Affairs Medical Center

REIMAGINING VETERAN HEALTHCARE

The COVID-19 pandemic ignited rapid change across the healthcare industry and unearthed an opportunity for VHA to delve deeper: to identify the crucial transformations needed to meet the needs of our richly diverse Veteran and employee communities. We call this effort “Reimagining Veteran Healthcare” (RVH), a three-phase human-centered design (HCD) approach to discovering, designing, and then testing solutions to accelerate the positive changes associated with the pandemic and to remain ahead of future shifts.

In Phase One, RVH set out to learn about the permanent shifts surrounding the way that people experience their lives, their healthcare, and their employment. We started with people – sitting on front porches, in backyards, and over video chats to hear what they had to say. In total, we conducted interviews with a diverse group of 113 Veterans, Caregivers, Veteran Service Organizations (VSOs), and VA leaders. We have held six “Join the Conversation” workshops with over 100 VA employees to understand the impact of the pandemic on their lives and work, and to hear their ideas for change. To help VHA set the standard for transformation in the healthcare industry, we focused on four key areas: Needs of the Modern Veteran, Unserved and Underserved Populations, Shifts in Healthcare, and Novel Solutions.

Figure 1: RVH, three-phased HCD approach

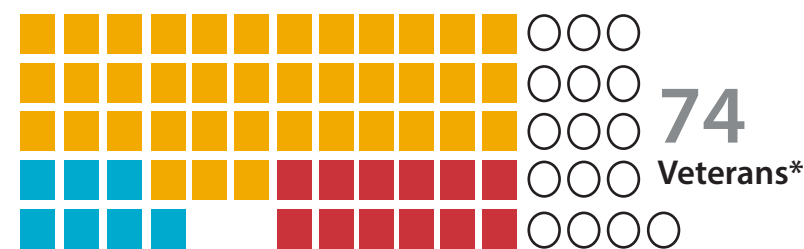


*Our goal is to develop breakthrough, nonlinear innovations of service delivery models to create or capture markets, services, products and customer segments **that do not yet exist.***



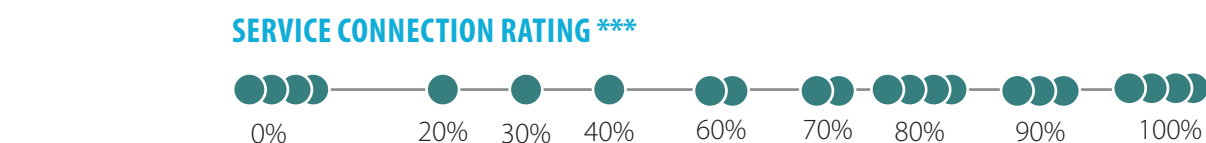
HERE'S A LOOK AT THE DEMOGRAPHICS OF OUR VETERAN PARTICIPANTS:

Sixty- to ninety-minute interviews were conducted with Veterans to understand their experience accessing and navigating VA healthcare and discuss their health care experiences at large.



engaged unenrolled enrolled, unengaged**

○ National Gathering interviewees****



*limited information exists for some Veterans, as demographic information was limited to what was shared in the interview, **enrolled, unengaged Veterans are enrolled in VHA but reported they have not accessed care within the last two years, ***data are limited by Veterans who did not know or did not share their rating, ****enrollment information not available

RACE AND ETHNICITY

Veterans Identifying as...

34 White

10 Black

1 Hispanic

15 American Indian/
Alaskan Native

3 Asian

9 Multiracial

GENDER IDENTITY & SEXUAL ORIENTATION

24 Women Veterans

14 LGBTQIA+ Identifying Veterans

VETERAN AGES

6 Aged 29 & under

36 Aged 30-49

10 Aged 50-69

6 Aged 70+

VETERANS



From our Veterans, we heard their need for seamless access to plug and play care – meaning when and where they need it. However, VA's complex systems often hinder Veterans' ability to access this care. Some give up entirely, while others sought help from another Veteran who could light the way. How can VHA create a welcoming, easy-to-use care system that does not depend on serendipitous relationships?

CAREGIVERS



From our caregivers, we heard that while they are aware of some of the VA resources available to them, they feel the VA does not understand how difficult their roles are, which can accelerate the pace of burnout. How can VHA envision a future healthcare system that is multiplayer, fully empowering, and engaging Veteran care ecosystems beyond our traditional borders?

LEADERS

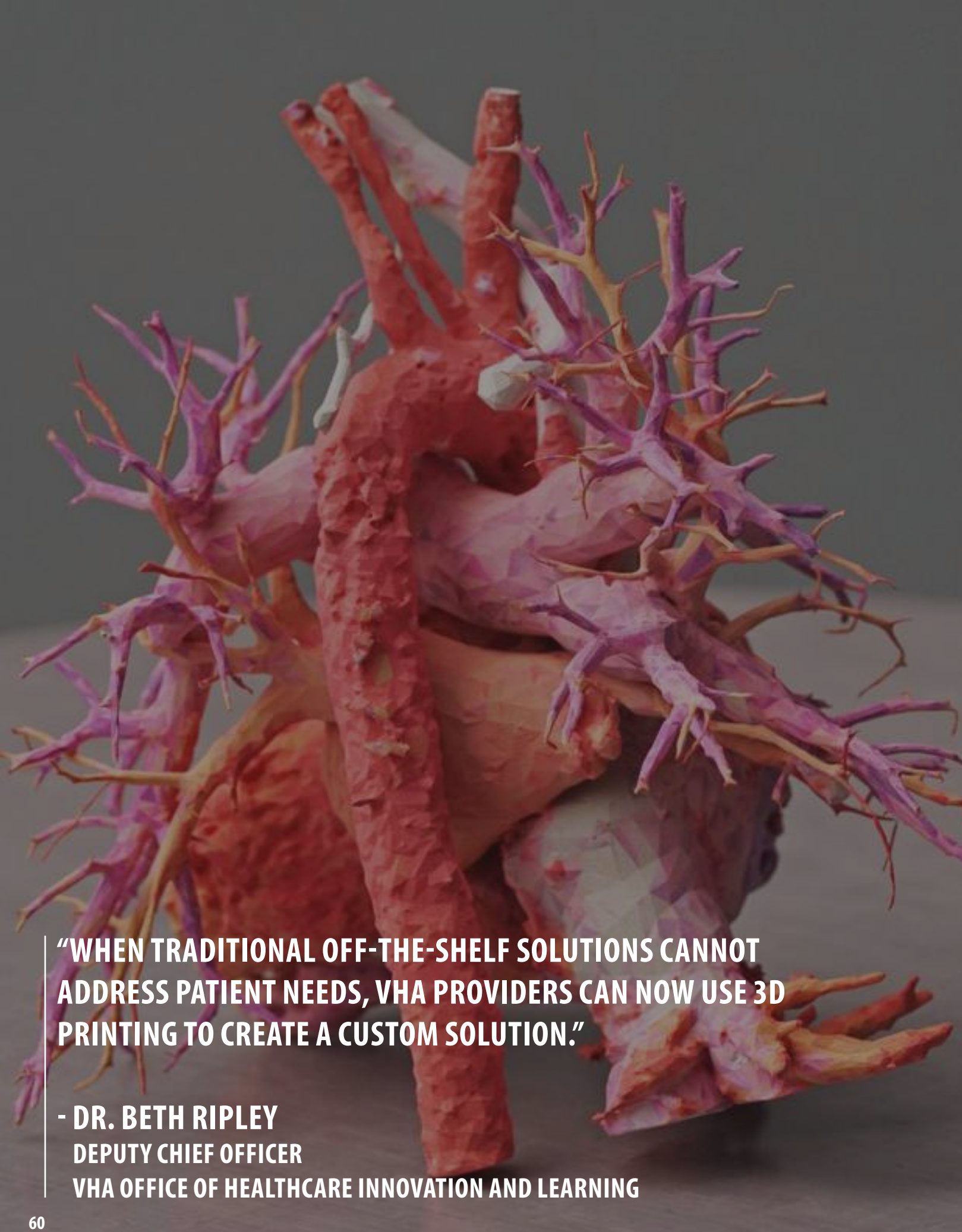


EMPLOYEES



And from our employees, we heard that the pandemic enabled them to rapidly innovate and solve problems in the moment -and they crave the ability to continue this long after the pandemic eases. How can VHA empower frontline staff to innovate and coordinate across silos while maintaining procedural oversight?

By Reimagining Veteran Healthcare, the VA is not just improving care - ***we are revolutionizing it.***



“WHEN TRADITIONAL OFF-THE-SHELF SOLUTIONS CANNOT ADDRESS PATIENT NEEDS, VHA PROVIDERS CAN NOW USE 3D PRINTING TO CREATE A CUSTOM SOLUTION.”

**- DR. BETH RIPLEY
DEPUTY CHIEF OFFICER
VHA OFFICE OF HEALTHCARE INNOVATION AND LEARNING**

ADVANCED MANUFACTURING



DELIVERING PERSONALIZED CARE WITH ADVANCED MANUFACTURING

Vietnam War Veteran, Michael Nicoletti, noticed that his hearing was off. Even when he doubled his wife’s television volume settings from twenty to forty, he was still straining to hear. Having spent over 30 years of his life as an engineer, Nicoletti started to tinker and found an at-home solution – drinking straws.

With this idea in mind, Nicoletti visited his Audiologist, Dr. Kent Flannagan, at Ralph H. Johnson VA Medical Center in Charleston, South Carolina. Dr. Flannagan diagnosed Nicoletti with acquired atresia, cartilage collapse in both ears preventing sound from reaching his inner ear. While alarmed by the idea of his patient sticking straws in his ears, Dr. Flannagan knew that they could leverage this idea to avoid surgery and find a less invasive solution to improving Nicoletti’s hearing. He reached out to biomedical engineer, Nikki Beitenman, who runs the Charleston VA Advanced Manufacturing Hub, to design and print a stent that the Veteran could use to help prop his ear canals open. 3D Printing (3DP) is an advanced manufacturing (AM) technology that allows people to make unique graspable products, adding material to an object, layer by layer. This process enables the production of complex shapes that use less material than traditional manufacturing methods. After six prototypes that incorporated the Veteran and Charleston Advanced Manufacturing team’s design iterations to fit, finish, and functionality, a personalized ear canal stent was created for the Veteran.

In February 2021, VA received compassionate use approval from the Food and Drug Administration (FDA) for the groundbreaking in-house developed GioStent medical device, named after Nicoletti’s grandson, Giovanni. FDA’s compassionate use authorization enables specific, individual patients to prototype unique treatments outside of clinical trials when there are no comparable alternative therapy options.



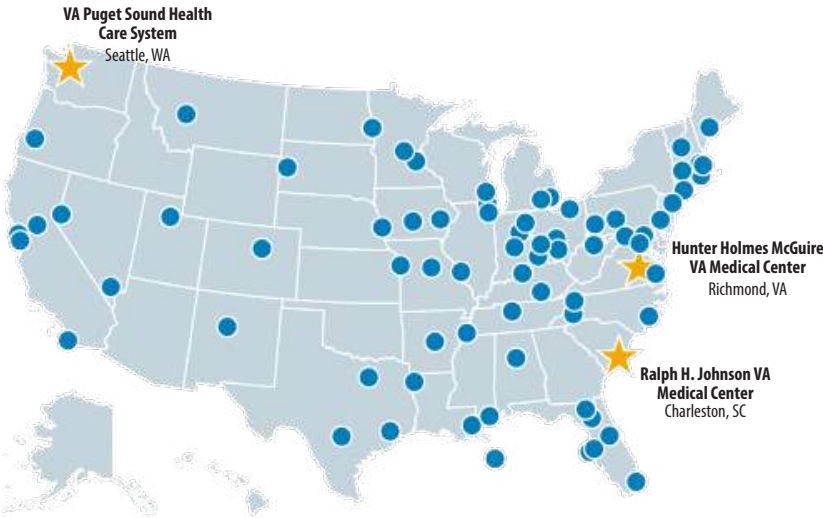
ADVANCED MANUFACTURING

3D PRINTING AT VHA

Expanding access to 3DP capabilities can address several current state challenges to scale and allow Veterans to have equitable access to innovative, timely, and personalized care. VHA is working to achieve this with the help of the VHA 3D Printing Network. The VHA 3D Printing Network is a conduit to share expertise, pool resources, test innovations, and scale 3D printing capabilities across the enterprise, growing from three sites in 2017, to 75 sites and growing in 2021.

ADVANCED MANUFACTURING HUBS

In 2020, three 3DP Network sites became VHA Advanced Manufacturing (AM) Hubs, VA Medical Centers with FDA-registered advanced manufacturing facilities. These sites were chosen for their historical 3DP applications, expertise, VAMC leadership support, and agility and ability to design, test, and iterate on prototypes to help address the pandemic-constrained PPE supply. AM hubs are building a 3DP infrastructure that focuses on training, quality and patient safety, product development, and leveraging advanced manufacturing technologies to deliver customized health solutions and 3D Printed medical devices to Veterans.



3D PRINTING NETWORK SITES

- Bay Pines VA Healthcare System
 - Birmingham VA Medical Center
 - Captain James A. Lovell (North Chicago) Federal Health Care Center
 - Central Arkansas (Little Rock) Veterans Healthcare System
 - Central Virginia (Richmond) VA Health Care System
 - Chalmers P. Wylie (Columbus) Ambulatory Care Center
 - Charles George (Asheville) VA Medical Center
 - Chillicothe VA Medical Center
 - Cincinnati VA Medical Center
 - Clement J. Zablocki (Milwaukee) Veterans Affairs Medical Center
 - Corporal Michael J. Crescenz (Philadelphia) VA Medical Center
 - Dayton VA Medical Center
 - Edward Hines Jr. VA Hospital
 - Fargo VA Health Care System
 - Fort Harrison VA Medical Center
 - Hampton VA Medical Center
 - Harry S. Truman Memorial Veterans' Hospital (Columbia)
 - Iowa City VA Health Care System
 - Jacksonville VA Clinic
 - James A. Haley (Tampa) Veterans' Hospital
 - James E. Van Zandt (Altoona) VA Medical Center
 - James H. Quillen (Johnson City) VA Medical Center
 - John D. Dingell (Detroit) VA Medical Center
 - Kansas City VA Medical Center
 - Lexington VA Health Care System
 - Louis A. Johnson (Clarksburg) VA Medical Center
 - Malcom Randall (Gainesville) VA Medical Center
 - Marion VA Medical Center
- Martinsburg VA Medical Center
 - Memphis VA Medical Center
 - Miami VA Healthcare System
 - Michael E. DeBakey (Houston) VA Medical Center
 - Minneapolis VA Health Care System
 - North Florida/South Georgia (Lake City) Veterans Health System
 - Orlando VA Medical Center
 - Overton Brooks (Shreveport) VA Medical Center
 - Providence VA Medical Center
 - Ralph H. Johnson (Charleston) VA Medical Center
 - Raymond G. Murphy (Albuquerque) VA Medical Center
 - Richard L. Roudebush (Indianapolis) VA Medical Center
 - Robley Rex (Louisville) VA Medical Center
 - Roseburg VA Health Care System
 - San Francisco VA Health Care System
 - South Texas (San Antonio) Veterans Health Care System
 - Southeast Louisiana (New Orleans) Veterans Health Care System
 - St. Cloud VA Health Care System
 - Tennessee Valley (Nashville) Healthcare System
 - Togus (Augusta) VA Medical Center
 - VA Ann Arbor Healthcare System
 - VA Bedford Healthcare System
 - VA Black Hills (Fort Meade) Health Care System
 - VA Boston Healthcare System
 - VA Caribbean (San Juan) Healthcare System
 - VA Central Iowa (Des Moines) Health Care System
 - VA Central Western Massachusetts (Leeds) Healthcare System
 - VA Connecticut (West Haven) Healthcare System
- VA Eastern Colorado (Aurora) Health Care System
 - VA Gulf Coast (Biloxi) Healthcare System
 - VA Maryland Health Care System
 - VA Nebraska-Western Iowa (Omaha) Health Care System
 - VA North Texas Health Care System
 - VA Northeast Ohio Healthcare System
 - VA Northern California Health Care System
 - VA Northern Indiana (Fort Wayne) Health Care System
 - VA NY Harbor (Manhattan) Healthcare System
 - VA Palo Alto Health Care System
 - VA Pittsburgh Healthcare System
 - VA Puget Sound (Seattle) Health Care System
 - VA Salt Lake City Health Care System
 - VA San Diego Healthcare System
 - VA Sierra Nevada (Reno) Health Care System
 - VA Southern Nevada Healthcare System
 - VA St. Louis Health Care System
 - Washington DC VA Medical Center
 - White River Junction VA Medical Center

VHA ADVANCED MANUFACTURING HUB PRODUCT PIPELINE

There are several products currently in the advanced manufacturing pipeline, the first three patient-matched products are outlined below. Each of these products moves through five formal phases of development that involve close collaboration with clinicians, engineers, designers, technicians, researchers, and regulators: investigation and viability, product planning, detailed development, clinical testing, and regulatory submission and market introduction. VHA is leading the field in leveraging advanced manufacturing technologies in customized healthcare applications, breaking away from a one-size-fits all model and moving towards solutions that address the unique needs of patients, when and where they need them.

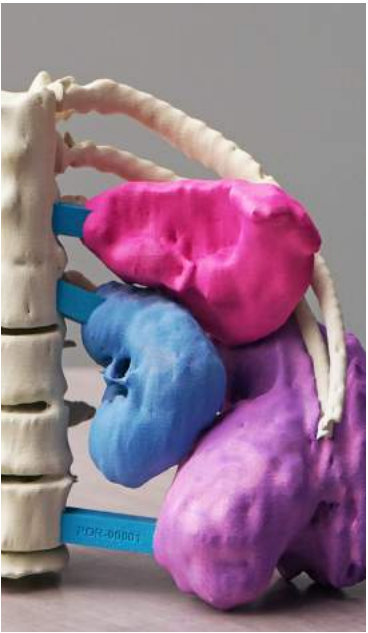


1. SURGICAL CUTTING GUIDES AND ANATOMIC MODELS FOR MAXILLOFACIAL RECONSTRUCTIVE SURGERY

These guides supplement surgical capability by providing pre-planned guides to improve surgical speed and joining of reconstructed bone. This product serves Veterans with cancers, chronic infections, or complex trauma to the maxilla or mandible (jawbone) that require removal of a portion of bone and reconstruction.

2. RADIOTHERAPY BOLUSES FOR FACIAL MALIGNANCIES

A bolus modulates therapy beam energy to improve dose delivery and uniformity to cancerous tissues, particularly in areas of complex facial anatomy (such as around the eyes, ears, and nose), where the off-the-shelf standard of care performs poorly. This 3DP product serves Veterans with superficial facial malignancies who need rapid treatment.



3. PRE-SURGICAL PLANNING MODEL FOR INTERVENTIONAL CARDIAC PROCEDURES

A presurgical planning model is a digital and/or physical 3D visualization of patient anatomy, derived from imaging. The primary benefit of these models is that the clinician is looking at a true three-dimensional object, versus the current standard of care, which are two-dimensional slices of a 3D object. These models serve Veterans by providing their physician additional information to help choose the best approach and device size to repair heart valves during minimally invasive procedures.



In 2021, VA Employee Education System, VHA Simulation Learning, Evaluation, Assessment, and Research Network (SimLEARN), and the Advanced Manufacturing Hubs launched a VHA 3DP introductory training to increase stakeholder exposure advanced manufacturing technologies and applications.

3D Printing in the VA Health Care System: Building the Hospital of the Future is an hour-long accredited VA Talent Management System (TMS) program that is the first of-its-kind in the Nation to introduce 3D Printing to VHA healthcare teams. The content includes the power of 3DP, history, current printer technology, imaging and design process, and current and future VHA AM applications in pre-surgical planning, dental implants, assistive technology, orthotic and prosthetic creation, facility management, surgical cut guides, and audiology.

The theme of this year's VHA State of Innovation report is Breaking Boundaries. To us, breaking boundaries is more than just challenging the status quo. It's shattering the status quo. In the context of VA healthcare, it's listening directly to Veterans and frontline providers in order to think differently, beyond the traditional healthcare constructs. It's convergence of this feedback and thinking with a robust innovation ecosystem to drive revolutionary changes in healthcare culture, policy, process, and technology. Breaking boundaries is how we move beyond the healthcare of today in order to deliver a new standard of care tomorrow.

I hope you enjoyed reading through this report and learning about the numerous examples of collaborations where VA is breaking boundaries in healthcare. Whether it's the human-centered design work to reimagine post-pandemic Veteran healthcare, utilizing in-hospital advanced manufacturing to enable personalized solutions at the point-of-care, or revolutionizing mobility of Veterans through our development of an advanced, sensor-enabled smart white cane for the blind, VA is working to deliver a new standard of care. I truly believe that there is no institution better positioned to lead the Nation toward the future of healthcare.

So why do I feel that VA is uniquely positioned to lead the Nation's healthcare revolution? Maybe it's because VA is the largest integrated health care system in the United States serving over 9 million Veterans through a network of 171 VA medical centers and 1,112 outpatient clinics in 50 states and several territories? Or could it be that VA is the largest provider of healthcare training in the United States with approximately 70% of all practicing physicians having trained at VA at some point in their career? Maybe it's VA's world-class health research infrastructure embedded into our frontline clinical operations? How about VA's unique perspective as both payer and provider in all markets, among all populations? That it's VHA's "Fourth Mission" to serve as the backup health care system for the Nation in times of emergency?

These are all compelling reasons why VA is uniquely positioned on a national scale, but they don't make the case, either individually or collectively, why the VA should lead this Nation's healthcare revolution. That reason uniquely lies with our mission to care for our Nation's Veterans. It's this mission that motivates our frontline staff to innovate; to work tirelessly, day in, day out, to give back to those men and women who have given so much for their country and their communities, to serve those who served. It's this mission that motivates our leadership to embrace change and create a culture of permission-less innovation so that VA can deliver solutions that change and save Veteran lives. It's this mission that attracts collaborators from across academia, industry, nonprofits, and other government agencies to be a part of something bigger than themselves. It's this mission that is uniquely VA and our single greatest asset. It's the glue that holds our innovation ecosystem together and compels us to lead, not only for Veterans, but for the Nation at large.

We are VA. Please join us in the revolution and let's break boundaries together.



Kristopher "Kit" Teague
Executive Director
VHA Innovation Ecosystem

On behalf of the VHA Innovation Ecosystem, THANK YOU to the following colleagues who work tirelessly behind the scenes to enable the amazing innovation that VHA delivers to Veterans everyday.

Without their support day in, day out, none of this would be possible.

- | | | |
|--|---|---|
| VA Center for Development and Civic Engagement | VHA Center for Limb Loss and MoBility | VHA Office of Rehabilitation and Prosthetic Services |
| VA Financial Services Center | VHA Chief Strategy Office | VHA Office of Research and Development |
| VA Infrastructure Operations, IT Franchise Fund | VHA National Center for Health Promotion and Disease Prevention | VHA Office of Rural Health |
| VA Medical Centers' Public Affairs Offices | VHA National Center for Patient Safety | VHA Office of Systems Redesign and Improvement |
| VA Office of Enterprise Integration | VHA Office of Academic Affiliations | VHA Office of the Assistant Under Secretary for Health for Operations |
| VA Office of General Counsel | VHA Office of Analytics and Performance Integration | VHA Office of the Assistant Under Secretary for Health for Patient Care Service (Chief Medical Officer) |
| VA Office of Information and Technology | VHA Office of Communications | VHA Office of the Assistant Under Secretary Health for Clinical Services (Chief Nursing Officer) |
| VA Office of Public and Intergovernmental Affairs | VHA Office of Connected Care | VHA Office of Veterans Access to Care |
| VA Regional Procurement Office East | VHA Office of Emergency Management | VHA Program Contracting Activity Central |
| Network Contracting Office 5 | VHA Office of Finance | VHA Rehabilitation and Prosthetic Services |
| VA Secretary's Center for Strategic Partnerships | VHA Office of Health Equity | VHA Workforce Management Consulting |
| VA Secretary's Veterans Services Organizations (VSO) Liaison | VHA Office of Mental Health and Suicide Prevention | |
| VA Strategic Acquisition Center | VHA Office of Population Health | |
| VA Technical Acquisition Center | VHA Office of Primary Care | |
| VA Technology Transfer Program | VHA Office of Procurement & Logistics | |
| VA Veterans Experience Office | | |





For more information, visit <https://www.va.gov/innovationecosystem>, or email vhainnovation@va.gov.