



RESEARCH CURRENTS

Research News from the U.S. Department of Veterans Affairs

Photo by Steve Ruh



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High altitude may negatively affect brain chemistry

Living at a higher altitude could negatively affect brain chemistry, found a study by VA Salt Lake City researchers and colleagues. Epidemiological studies have suggested that living at high altitude may be a risk factor for mood disorders, substance abuse, and suicide. The researchers used brain imaging to compare metabolite levels in the brains of patients living in Utah, Massachusetts, and South Carolina. Metabolites are molecules that the brain needs to function properly. Patients in Utah, which is at a higher elevation, had lower levels of several brain metabolites, compared with patients in the two other locations closer to sea level. Larger studies are needed to examine how altitude affects brain chemistry and mental health conditions, according to the researchers. (*Psychiatry Research: Neuroimaging*, Aug. 30, 2021)

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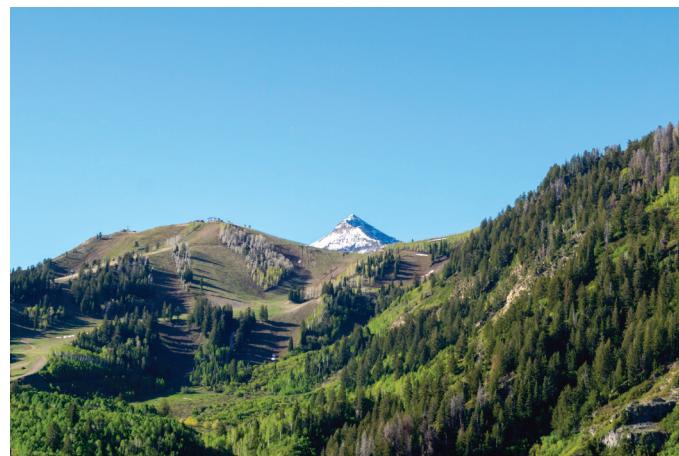


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COVID-19 pandemic has not increased suicide risk in Veterans

The COVID-19 pandemic has not increased suicidal behavior among Veterans, according to a VA National Center for PTSD study. Many scholars warned that hardships and isolation caused by the pandemic could create a “perfect storm” of suicide risk among vulnerable populations. Researchers surveyed more than 3,000 Veterans in November 2019, and again in November 2020. They found that rates of suicidal thoughts actually decreased by nearly a third during the pandemic, from 10.6% of Veterans surveyed to 7.8%. The number of suicide attempts did not increase during the study period. However, Veterans who contracted COVID-19 were more than twice as likely to report suicidal thoughts than they were before infection. The results suggest that the resiliency of Veterans and increased social support may be protective against suicide risk during a health crisis, according to the researchers. More research is needed into how the physical and social effects of COVID-19 infection may affect suicide, they say. ([JAMA Psychiatry](#), Aug. 25, 2021)



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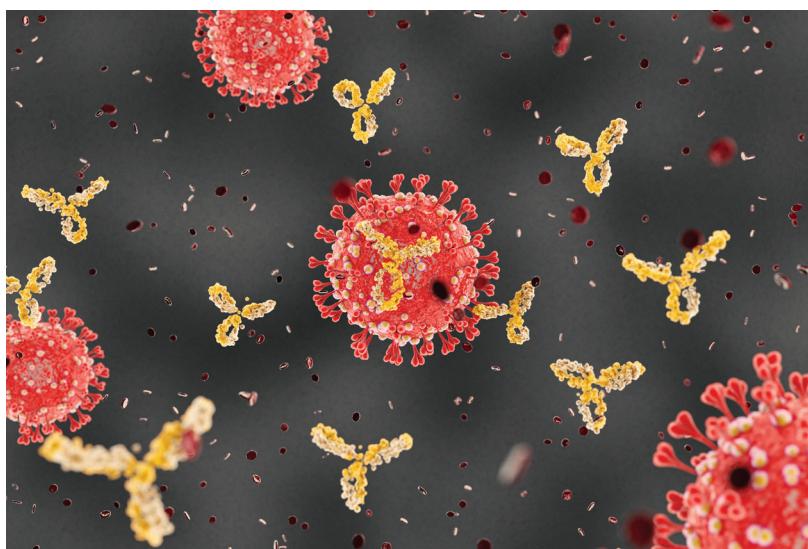


PTSD treatment improves sleep

PTSD treatments improve sleep difficulties, according to a review that included a VA Greater Los Angeles researcher. Patients with PTSD often have difficulties with sleep. Researchers reviewed 89 studies on various PTSD treatments. They found that treatments that improved PTSD symptoms also improved sleep. Different types of treatment all led to better sleep. Interventions that specifically targeted sleep were more effective at improving sleep outcomes than other PTSD treatments. The results show that treatments that target sleep improvement

may be helpful for patients with PTSD, say the researchers. ([Sleep Medicine](#), Aug. 19, 2021)

Photo: ©iStock/Floriane



was 6.5%, compared with 6.2% in other patients. The results show no meaningful differences between patients treated or not treated with convalescent plasma for non-severe COVID-19, according to the researchers. (*Journal of Infectious Disease*, June 21, 2021)

Convalescent plasma treatment did not affect COVID-19 mortality

Convalescent plasma treatment did not reduce mortality in patients with non-severe COVID-19, in a study of VA patients. Convalescent plasma is a treatment using the blood from a person who has recovered from COVID-19. Scientists hypothesized that transferring antibodies to the new patients could improve recovery. Out of nearly 5,000 VA patients admitted for non-severe COVID-19 between May and November of 2020, about 8% received convalescent plasma. Thirty-day mortality for the convalescent plasma patients

Photo: ©iStock/koto_fea



expression in the hippocampus. Genes involved in neuron health were downregulated after chemical exposure. The results suggest that exposure to these toxic substances could cause chronic neurodegeneration. The findings could help explain how Gulf War illness develops, according to the researchers. (*Life Sciences*, July 20, 2021)

Gulf War toxic exposure may be linked to damaging gene expression changes

Toxic exposure during the Gulf War may alter gene expression in the hippocampus, which could cause memory problems, found a VA New Jersey study. The hippocampus is a part of the brain involved in spatial memory. Researchers simulated Gulf War toxic exposure in mice using three chemicals: two insecticides and an anti-sarin prophylactic. The chemical exposure resulted in inflammation and other changes in gene



Knee replacement surgery at VA facilities leads to fewer complications than community surgeries

Veterans receiving knee replacement surgery at VA facilities generally have fewer complications than those who receive VA-purchased surgery in the community, found a VA study. In addition to delivering health care directly, VA is increasingly purchasing health care for Veterans in the community. Researchers compared post-surgery complications between Veterans who had knee replacement surgery at VA and in the community.

Overall, complication rates were significantly lower for VA-performed surgeries. However, there were five locations where VA-purchased care outperformed VA-delivered care. However, there were five locations where VA-purchased care outperformed VA-delivered care. In an email, lead researcher Dr. Alex Sox-Harris emphasized that the findings at those sites should not be “misinterpreted to mean those five facilities provided suboptimal care. We did not look at that directly. What we can say is that those five facilities managed to purchase care of even better quality than they delivered.” The results highlight the importance of monitoring quality of care both at VA facilities and where Veterans receive outside care, say the researchers. ([Health Affairs](#), August 2021)

Shorter antibiotic treatments effective at treating UTIs in men

A shorter course of antibiotics can effectively treat urinary tract infections in men, according to a study by Minneapolis VA and Michael E. DeBakey VA Medical Center researchers. Standard treatment for UTIs is antibiotics for 7 to 14 days. In a study of more than 300 men, taking antibiotics for seven days was as effective as a 14-day course at resolving symptoms. Being on antibiotics for a shorter period of time is easier on patients who may experience side effects, say the researchers. Shortening the course of



antibiotic treatment is also important for preserving the overall effectiveness of antibiotics. ([JAMA](#), July 27, 2021)

VA researcher exploring meditation as a therapy for PTSD



Photo by Christopher Menzle

Dr. Ariel Lang (second from right) practices meditation with associates from her lab. She's focusing on complementary and alternative techniques, such as yoga and meditation, as a therapy for patients with PTSD.

About two decades ago, Dr. Ariel Lang was completing her clinical internship and post-doctoral fellowship in clinical psychology at the University of California, San Francisco. One of her mentors was [Dr. Paul Ekman](#), a psychologist and professor at the university.

Ekman was a pioneer in the study of emotions and their relation to facial expressions. He forged a friendship with the Dalai Lama, the traditional high priest of Tibetan Buddhism. The two co-authored a book in which they engaged in a conversation about human emotions from a Buddhist philosophy and the pursuit of psychological fulfillment. The book, published in 2009, stressed the importance of meditation.

Knowing Ekman had been impactful in her career development, Lang eagerly read the book.

"Out of that, I became really interested in the ways in which they were talking about the philosophy behind meditation and how it seemed to match with some of the struggles that we see in people with PTSD," she says. "With PTSD, there's a lot of social withdrawal and loss of positive emotions like excitement and joy. Meditative approaches can create the opposite of those things. Compassion-based meditation, which is based on Buddhist tradition but has been adapted so anyone can participate, helps people feel warmth toward others. I became interested in meditation conceptually based on that."

"[The authors] weren't thinking about PTSD," she adds. "But the book just spoke to me in terms of what it might bring to PTSD care. That was definitely my inspiration for starting on a lot of my work."

Today, Lang is the director of the Center of Excellence for Stress and Mental Health at the VA San Diego Healthcare System. She's also a professor at the University of California, San Diego. Her research and clinical work are focused on trauma-related disorders, including the use of complementary and alternative techniques, such as meditation, for treating PTSD.

Lang has been involved with six studies related to meditation, including two projects that she led. She is exploring the following types of meditative practices for their potential to ease PTSD symptoms in Veterans:

Mindfulness: focusing on the present moment, while calmly acknowledging and accepting one's feelings, thoughts, and bodily sensations. Yoga can be thought of as a form of mindfulness because the focus is on pairing movement and breath.

Mantram repetition: silent repetition of a spiritual word or phrase to foster a sense of peace and relaxation, combined with holding concentration in a single direction and slowing down.

Transcendental meditation: detaching oneself from anxiety and promoting harmony and self-realization by meditation and repetition of a mantra, a word or sound repeated to aid concentration in meditation.

Loving kindness meditation: a repetition of wishes for safety, happiness, health, and peace for self and others (see sidebar).

Compassion meditation: a practice intended to cultivate the ability to extend and sustain compassion toward self and others. Meditation has been linked to a number of benefits, including decreased anxiety and lower cardiovascular risk. But research on the potential benefits of meditation for patients with PTSD has been inconclusive. For some patients, meditation appears to provide strong benefits. But others may not notice a change. Veterans who are interested in meditation, Lang says, should try different types to see which one is most helpful.

Lang spoke to VA Research Currents:

VA Research Currents: What are the benefits of meditation as a therapy for PTSD?

We're just learning that. Asking about what meditation does for PTSD is like asking about what medication does for PTSD. It really depends on which meditation we're talking about, just like it would depend on which drug we're talking about. Different meditations potentially do different things.

You can think of PTSD in some way as an attention disorder. What happens when someone has a flashback or an unwanted memory is their attention is diverted to someplace else, someplace they don't want to think about right now. If you think about it that way, managing PTSD is about keeping your attention where you

want it to be. One thing that meditation does—and this is certainly true of mindfulness meditation—is help to train attention. This is also why I'm interested in yoga because yoga trains attention. In fact, yoga will give you feedback if you're not paying attention. So if you're not paying attention and you're trying to balance on one foot, you're going to fall over.

The key with a meditation like compassion meditation or loving kindness meditation might be

one's sense of belonging or the ability to connect with others. Compassion meditation and loving kindness meditation are similar in that they focus on thinking about others in a more positive way, but they are based on distinct Buddhist concepts, and the practices are different. PTSD is often characterized by social withdrawal. Veterans often struggle with a sense of "in group" and "out group." It can be hard for them to relate to civilians, or certain people may remind them of former combatants. Meditations that focus on compassion and relief of suffering can be a really good match for those Veterans.

"It's really important to try to drive gains in research that are connected with the kinds of clinical care that we're providing, so there's a link between the innovation and outcome that we're trying to achieve."

PTSD is also a disorder of arousal, so you get the jumpiness, the physical sensations, the panic-like symptoms. It looks like meditations such as mantram repetition and transcendental meditation may be really helpful for easing hyperarousal symptoms. Ultimately, I would like to someday be able to guide people, "This is the way your PTSD is manifesting itself. Let's try this first because we think this type of treatment may match the trouble that you're having."

Is mindfulness synonymous with yoga?

No. But yoga often incorporates mindfulness. Mindfulness is just focusing on the present moment with an attitude of non-judgment and non-reactivity. In the case of yoga, that focus will be on pairing the breath with the movement. One can focus on many things during a mindfulness practice, though. Breathing, walking, and eating are examples. Mindfulness ends up being a building block for many practices. In order to do the compassion meditation we do, we first teach mindfulness. But yes, in terms of what they would do for PTSD, namely help with attention control, mindfulness and yoga are pretty similar.

Should meditative approaches be stand-alone therapies for patients with PTSD, or should they be used as a complementary therapy with one of VA's main trauma-focused psychotherapies and/or medication?

It can be any of the above. We can't at this point tell patients we know what's going to be best for them. We have our guesses based on averages, but an average never predicts to a person. At this point,

I wouldn't recommend meditation as the first thing you ever try. So if somebody comes to me, and they have newly diagnosed PTSD, I'm going to recommend a trauma-focused therapy, [cognitive processing therapy or prolonged exposure](#), because that's my best bet. On average, those are the most effective things that we have. Some people are going to go do one of those therapies, and they're going to get a whole lot better. End of story.

But a lot of other people are going to tell me, "Doc, no way, I'm not talking about my trauma." So what do

"If you ask Veterans what they want as a part of their overall wellness program, meditation is something that they want. VA listens to Veterans."

you do for those people? That's one of the places where meditation comes in. It's another therapy we can try. We'll see what benefit we get. You do 100% better, you're merrily on your way. If you don't, maybe you've found some things that help, maybe you trust me a

bit more, and then we figure out together what's the next step for you. In my experience—I started with the Vietnam Vets in 1992—PTSD is not a one-and-done thing very often. It works out that way for a few people. But most patients have to try something and get a bit better, then try something else and more forward again. It becomes an ongoing process of putting together a new lifestyle with support from therapy, maybe medication, maybe alternative practices that help them to really manage their symptoms. I really hope that a Veteran will never give up. It will never be as if the trauma never happened. But if the Veteran takes recovery one day at a time, life can still become really good.

Read more at www.research.va.gov/currents ★

Sailing as a therapy?

Dr. William Marchand is an avid recreational sailor. To him, the scenery, wind, and water are calming and compatible with mindfulness.

Mindfulness involves focusing on the present moment, while calmly acknowledging and accepting one's feelings, thoughts, and bodily sensations. Walking, hiking, meditation, and yoga can help someone achieve a state of mindfulness—as can any other type of sport or recreational activity—if one is focused on the present.

So an idea dawned on Marchand, a psychiatrist at the VA Salt Lake City Health Care System. Understanding that many Veterans with mental conditions and substance use disorders do not experience full remission from conventional treatments or engage in such therapies at all, he and VA colleagues embarked on testing a recreational program that would encourage participation by offering an enjoyable experience, while imparting a therapeutic benefit.

His choice: mindfulness-based therapeutic sailing (MBTS).

"There isn't a rule that says treatment can't be fun," he reasons.

'Bringing one back to the present moment'

Marchand has led three pilot studies thus far, including one with nature exposure through recreational sailing and another with nature exposure through sailing combined with mindfulness training. The latter teaches one to have a non-judgmental awareness of the present and to differentiate that from autopilot thinking, or thinking instinctively, about the past and the future, according to Marchand.

"The practice involves being aware of that autopilot thinking and bringing one back to the present moment," he says. "That's primarily what we wanted as the take home message about mindfulness, something that people could grasp in a short period of time and could start using."

Marchand's most recent research was based on what he and his colleagues learned from the first two pilot studies: The concept appeared to be feasible and warranted further evaluation, and the sessions should



Dr. William Marchand's most recent study on sailing as a recreational therapy included 25 Veterans, each of whom had had at least one mental health condition or substance use disorder.

include only sailing and not classroom-only sessions. The study included mindfulness training and was aimed at establishing a version of MBTS that would be ready for a rigorous controlled study with a large number of participants. The findings appeared in the journal Military Medicine in February 2021.

The study included 25 Veterans, all but two of whom were men (see sidebar). Each participant had at least one mental health condition or substance use disorder, and more than 90% had two or more conditions. With help from the Park City Sailing Association in Utah, the Veterans engaged in three sailing sessions of at least an hour each at the Jordanelle Reservoir State Park in Utah.

The researchers used a physical activity enjoyment scale to determine how much the participants liked the program. Scores indicated that most of the participants enjoyed the sailing, and that it was potentially linked to a decline in substance use treatment services. But the latter finding, Marchand cautions, is a correlation and not a cause and effect. He says it's unclear how MBTS is related to less need for substance abuse treatment.

"The sailing possibly helped participants decrease substance use, and thus less treatment was needed," Marchand says. "But more rigorous studies will be needed to further explore this finding."

Read more at www.research.va.gov/currents ★

Study links PTSD, anxiety fears in women with history of military sexual trauma

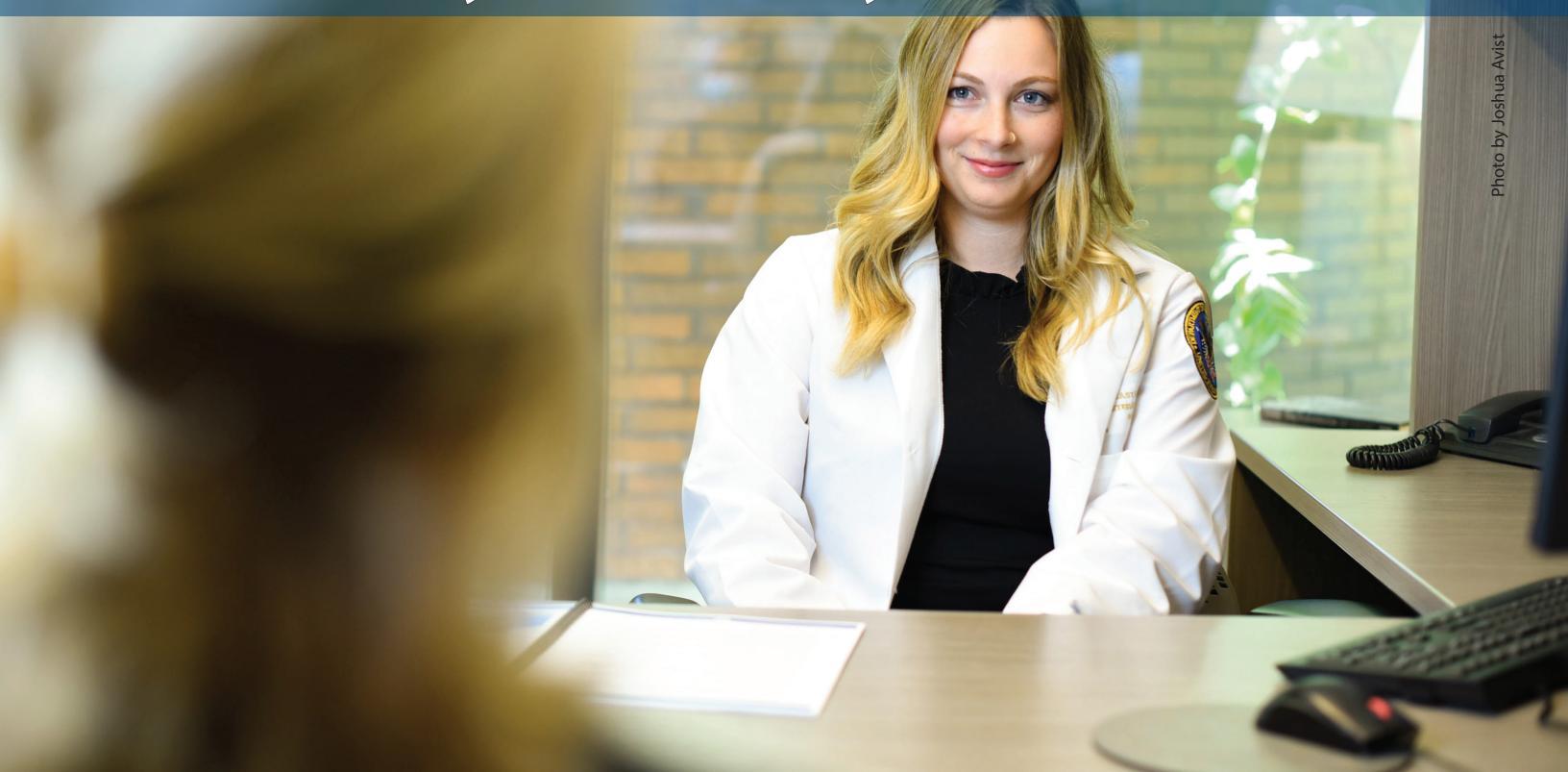


Photo by Joshua Avist

Dr. Chelsea Ennis, who led the study, is a clinical psychologist at the Southeast Louisiana Veterans Health Care System.

A new VA study finds a strong link between PTSD symptom severity and anxiety sensitivity among female Veterans who have experienced military sexual trauma. The researchers say treating the anxiety problem may be a way to ease core PTSD symptoms.

Anxiety sensitivity reflects a fear of physical sensations that accompany anxiety. A person with high levels of anxiety sensitivity may misinterpret normal bodily sensations, such as a racing heart in some situations, as an indicator of heart problems. Someone with low anxiety sensitivity would likely regard this sensation as uncomfortable but non-threatening.

The [results](#) appeared in the journal *Military Psychology* in September 2021.

Dr. Chelsea Ennis, a clinical psychologist at the Southeast Louisiana Veterans Health Care System, led the study. She and her colleagues examined the connection between anxiety sensitivity and PTSD symptom severity in a group of female Veterans with a history of military sexual trauma. The Veterans volunteered for the study. Although the link between anxiety sensitivity and PTSD has been well-established, the researchers determined that anxiety sensitivity had not been studied among women who've experienced military sexual trauma.

PTSD is characterized by various symptoms grouped together due to their similarity, with four known clusters:

- Intrusion (nightmares, distressing memories)
- Avoidance (of people, places, or things that remind one of a traumatic event)

- Negative thoughts and emotions (beliefs that the world is dangerous, a lack of positive emotions)
- Arousal (hypervigilance, exaggerated startle).

Reducing anxiety sensitivity can reduce PTSD symptoms

The researchers found that anxiety sensitivity was strongly related to two of the clusters—arousal and reactivity, and negative changes in cognition and mood—but not to intrusion and avoidance. “Given the [treatable] nature of [anxiety sensitivity], future research should examine the extent to which targeting this cognitive-behavioral construct reduces PTSD symptoms among such samples,” Ennis and her team write.

A growing body of [research](#) is showing that brief psychological treatments designed to combat myths regarding the danger of physical symptoms of anxiety, coupled with repeated exposure to these sensations, can lead to reductions in anxiety sensitivity, according to Ennis. Interoceptive exposure, which is based on getting someone used to the physical sensations of anxiety, is one such treatment.

“For example, for someone who really fears their heart is racing because they’re worried that they’re going to have a heart attack, we may have them run in place over and over again to get them used to that physical sensation,” Ennis says. “Or for someone who feels like they get really nervous when their breathing changes ... when they’re anxious, we may have them hyperventilate over and over again to show them that there’s no danger in hyperventilating and that nothing bad happens.”

Interoceptive exposure, Ennis notes, is mainly used as a treatment for panic disorder because anxiety

sensitivity is strongly linked to panic disorder. It could be used as a complementary treatment to medication or one of the trauma-focused psychotherapies VA uses to treat patients with PTSD—cognitive processing therapy or prolonged exposure.

“Importantly, [research](#) has shown that reducing a person’s anxiety sensitivity can, in turn, reduce his or her PTSD symptoms,” she adds.

‘People with PTSD have panicky feelings’

Dr. Ariel Lang is a clinical psychologist at the VA San Diego Healthcare System who specializes in anxiety- and trauma-related disorders. She’s not surprised about the strong link in Ennis’ research between anxiety sensitivity and the PTSD symptom clusters of arousal and negative thoughts.

“Anxiety sensitivity is when you’re afraid of your own anxiety-related physical sensations,” Lang explains. “It drives people who have panic disorder and is super-common in PTSD, because people with PTSD have these panicky feelings. When something terrible happens to you, your body’s fight-or-flight response kicks in, and you get this rush of fear.

“People can be very uncomfortable with that feeling,” she adds. “It’s not pleasant to have that fearful feeling, which can happen at times when people don’t want it to happen. It takes on its own life because you’re essentially creating a vicious circle. The more afraid you are of your fear, the more fearful you’ve become, and the more you have to be afraid of. That’s why it would relate to the hyperarousal symptoms and some of the other symptoms that are involved in the way you look at the world.”

Read more at www.research.va.gov/currents ★

U.S. pullout from Afghanistan: How it impacts Veterans, service members



Dr. Joseph Geraci discusses his experiences transitioning out of the military as he certifies a group of people who have volunteered to help service members reintegrate into society.

Dr. Joseph Geraci fought on the battlefield in Afghanistan. After 9/11, he deployed four times to the country as an Army combat leader with elite special operations, ranger, airborne, and infantry units. He risked his life on multiple missions and lost comrades like one who was killed in a gun battle after being ambushed by more than 100 Taliban fighters.

He retired in 2018 as an infantry lieutenant colonel and is now a clinical psychologist at the James J. Peters VA Medical Center in the Bronx, New York. He's affiliated with the [VISN 2 Mental Illness Research, Education and Clinical Centers \(MIRECC\)](#).

Like many of the more than 4 million Veterans or active-duty personnel who have served since 9/11, he's battling a sense of heartbreak, frustration, and confusion following the U.S. withdrawal from Afghanistan and the subsequent Taliban takeover of the country—the same Taliban that harbored al-Qaida terrorists who planned the 9/11 attacks.

Was our service for naught, he and others are asking themselves? What did our nation get in return for us sacrificing so much blood and treasure over the past 20 years? Will I be welcomed back as I try to transition to civilian life?

With this in mind, Geraci believes his role as a clinical psychologist and as co-director of the [Transitioning Service-member/Veteran and Suicide Prevention Center \(TASC\)](#) is more urgent than ever. With co-director Dr. Marianne Goodman and the TASC team, Geraci studies and develops programs aimed at reducing the reintegration difficulties of Veterans and preventing suicide.

Within the TASC, Geraci leads two national VA initiatives that focus on reintegration and seek to bridge the Veteran-civilian divide: Veteran Cultural Competence Training, a day-long experience through which VA and non-VA professionals gain a new perspective on Veteran identity and emotional experiences; and VA's Transitioning Servicemember/Veteran Sponsorship Initiative, which assesses the effectiveness of service members being helped by volunteer and certified sponsors from nonprofit endeavors.

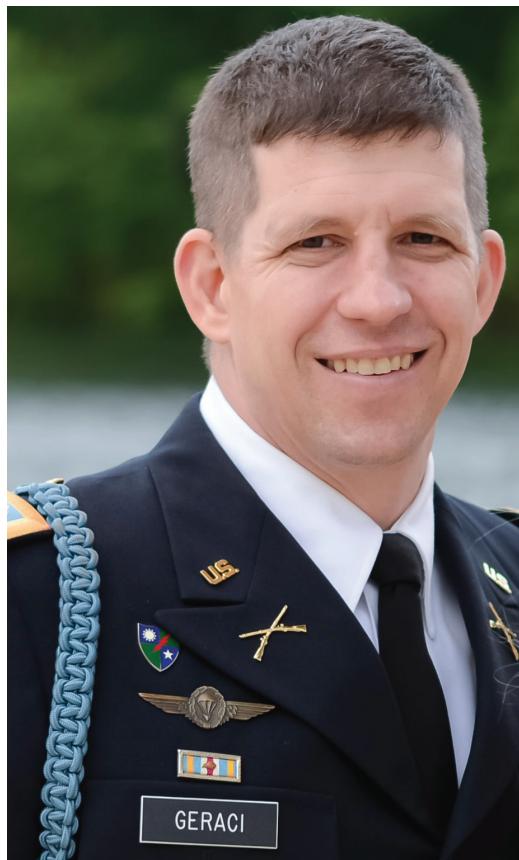
Geraci spoke to [VA Research Currents](#) about the mental and social challenges he expects post-9/11 Veterans to face, whether or not they served in Afghanistan:

VA Research Currents: What kinds of patients do you see?

Geraci: Most of the Veterans we see in the TASC are recently transitioned Veterans with combat experience who struggle with reintegration to civilian life. Many times, these struggles manifest as acute suicide risk, anxiety, depression, PTSD, substance use, and adjustment disorder. Some of our patients are still on active duty, are on VA's high-risk suicide list, and/or were assigned to us prior to discharge from our VA in-patient facility.

How vulnerable are your patients and post-9/11 Veterans in general to experiencing mental disorders, including suicidal thoughts, from what has transpired in Afghanistan?

We as post-9/11 Veterans are very resilient and can make significant and positive contributions to society. But at the same time, our military service and the difficulties we face reintegrating to civilian life make us one of the highest-risk Veteran populations. In fact, the [suicide rate has doubled](#) for the youngest post-9/11 Veterans over the last 13 years. Our research shows that it isn't just the combat. It isn't just the PTSD. It's also the reintegration difficulties we face as we transition. These difficulties greatly increase the risk for suicide. Therefore, in one of our publications, we describe the period between exiting the military



Geraci, an Army Veteran, deployed four times to Afghanistan and earned multiple honors, including the Bronze Star, the Air Medal, and Combat Infantryman Badge.

and successful reintegration as the "[deadly gap](#)."

When combined with what is currently being played out in Afghanistan—which can be viewed by some as a form of moral injury—it has the potential to leave us more susceptible to psychological challenges. Processing the emotions related to the Afghanistan withdrawal may be a sizeable burden for some Veterans that can weigh them down. It is yet another heavy rock for them to carry in their “rucksacks.” At this point, it’s just anecdotal, but I am concerned that the situation in Afghanistan is going to increase the suicide risk for some post-9/11 Veterans. Therefore, I am thankful that my VA colleagues have posted many of the VA and non-VA resources available to post-9/11 Veterans.

Read more at www.research.va.gov/currents ★

Concept to reality: bringing innovations to market



Photo by Jeff Grandon

Dr. Tracy Frech, a VA rheumatologist, is working with VA-TEAM in hopes that her software aimed at benefiting Veterans with Raynaud's phenomenon will eventually reach the marketplace.

Frustration set in for Dr. Tracy Frech. A rheumatologist at the VA Salt Lake City Health Care System, she has long sought to improve care for patients with a condition called [Raynaud's phenomenon](#), a decrease in blood flow mostly to the fingers and toes usually because of cold, stress, or emotional suffering. The most severe cases can lead to amputation.

Frech launched a telemedicine program at VA in 2011 and learned, for one, that many of her patients had suffered injuries to their fingers due to bitter cold temperatures while serving in Afghanistan. She also received complaints that some patients weren't getting timely evaluations.

"One of the issues with Raynaud's phenomenon is that 95% of the time, it's okay for a delay," she says. "Patients eventually get a rheumatologist. But in about 5% of patients, an earlier diagnosis can lead to outcomes that are substantially better, and we can save fingers. I thought to myself I wish we had the ability of getting patients in sooner using advances in telemedicine."

VA researcher receives education, mentoring

Frech, who is also affiliated with the University of Utah, envisioned a software package that would allow a patient to upload an image of the base of the finger. The software would analyze the photo and pull the relevant data to get the patient to the right health care provider, assigning urgency to those who possibly have Raynaud's phenomenon.

But Frech needed help in developing the concept and understanding how to get it to market so it would have value to all stakeholders, including patients, hospital administrators, and physicians in primary care, surgery, infectious disease, and rheumatology. She thus turned to a new program that calls for trained business advisors to provide education, mentoring, and other assistance to VA researchers who are pioneering VA-funded innovations that can potentially reach the marketplace.

In Frech's case, the [VA Translational Education and Mentoring Center \(VA-TEAM\)](#) has offered direction through videos, consultation, and other means on refining her software so it can be approved by the U.S. Food and Drug Administration (FDA). Her product was one of 16 VA innovations accepted into phase one of VA-TEAM based on its potential to qualify for a VA technology transfer license to industry. A committee of business experts and VA representatives chose the innovations, each of which was assigned a project manager and business advisor.

The chosen projects had to include VA-owned intellectual property.

Eight of the 16 projects will be tapped for phase two, which provides a much more hands-on and comprehensive experience for the researchers. Phase 2 involves weekly meetings with an advisor and work in understanding each project's unique approach to government regulations, development, testing, and implementation, among other things. The researchers also spend much time learning how to communicate the value of their inventions to a business- or investment-minded audience.

Frech has been impressed with the guidance provided by VA-TEAM.

"The real strength in the program is not just in the videos," she says. "They meet with you every week to talk about where you're at with the product, how you

can develop it further, how to reach more stakeholders, and how your interviews are going. The amount of investment they put in to make sure that you do a really good job at getting a product that is exciting to the people you're pitching it to is commendable. They also walk you through all of the paperwork. Presentations explain patents and therapeutics and how you get things to market. Not only is it what I would say an educational program. It really determines how to put your best product forward."

'What else would you like us to do?'

[VA's Biomedical Laboratory Research and Development program \(BLR&D\)](#), which supports and conducts preclinical research to advance science and understand how diseases affect Veterans, funds VA-TEAM. Housed at the Louis Stokes Cleveland VA Medical Center, VA-TEAM is led by Dr. Andrew Cornwell, a biomedical engineer at the Cleveland VA.

Cornwell and his VA-TEAM colleagues are working closely with [VA's Office of Research and Development \(ORD\) and VA's Technology Transfer Program](#). ORD has been instrumental in guiding VA-TEAM and making sure it has the resources to be successful. The Technology

Transfer Program facilitates the commercialization of VA inventions by assisting in patenting and licensing.

VA-TEAM grew out of the belief that too many VA investigators have been unable to move their innovations from concept to the marketplace, says Dr. Arun Sharma, a health science officer in the Office of Research and Development. BLR&D thus created surveys in 2019 to assess what type of support VA researchers need to advance their inventions to the commercial stage. The surveys essentially asked, "We have funding, what else would you like us to do?" Sharma notes.

Read more at www.research.va.gov/currents ★

One-two punch helps Veterans with weight loss



Photo by Michael Drake, VA NY-Harbor.

Dr. Jose Aleman is director of the NY-MOVE! Endocrinology Weight Management Clinic at VA NY-Harbor Healthcare System. He is pictured with a medical student, Ms. Laetitia Zhang.

You've tried to do everything right. You've passed on the Buffalo chicken wings on poker night. You've cut back on alcohol and switched to light beer. You've even joined the local gym. Nothing seems to work—those extra 50 lbs. won't budge.

Well, you are not alone.

Obesity is a chronic disease where the pathways that control how much we eat can lead us to take in too many calories and accumulate excess fat that promotes health complications, says Dr. Jose O. Aleman, an endocrinologist at the VA New York Harbor Healthcare System, Manhattan Campus. When coupled with easy access to poorly nutritious food, individuals with obesity often struggle with their weight loss goals.

Aleman is the director of the NY-MOVE! Endocrinology Weight Management Clinic at the NY-Harbor VA. He also leads clinical research to find the best ways to help Veterans reach a healthier weight.

Aleman and his team published a [study](#) in the journal *Obesity* that examined the effectiveness of pharmacotherapy—weight-loss medication—when combined with lifestyle changes. The study confirmed the benefits of medication, but noted significant variability among individual patients. The researchers found the most effective weight-loss agents were phentermine/topiramate (Qsymia), followed by liraglutide (Saxenda), and orlistat (Alli).

"Both at the local and national level, we found obesity pharmacotherapy is effective in changing the trajectory of weight in Veterans in addition to lifestyle changes, said Aleman.

The study examined data for 43 local Veterans who were enrolled in the NY-MOVE! weight-loss program and who were prescribed an obesity medication. The most commonly prescribed medications at the local level were metformin (Glucophage), liraglutide, and phentermine/topiramate.

The research team wanted to know how well the local group of Veterans were doing in comparison to the larger VA population. Aleman's team reviewed nearly 578,000 VA health records nationwide for Veterans who had an obesity diagnosis or metformin prescription in their VA health record. Metformin is a commonly prescribed diabetes drug that [can help](#) with weight loss.

In comparison to the New York group, the national group of Veterans had greater numbers of men, were less racially diverse, and were later in their disease progression—86% had type 2 diabetes, compared with 44% of the local group.

On average the New York group lost 8.8 pounds over the initial six-month period. Over a one-year period, 75% of the national group lost between 5.5 to 11 pounds after starting weight-loss medication.

Don't do it alone

Diet and exercise are typically first-line treatments for weight loss. In the case of Veterans, Aleman says excess weight may be related to the lack of structure they encounter after their military service is over. That is why the VA-MOVE! Weight Management Program is designed to reintroduce structure for Veterans.

VA-MOVE! makes use of behavioral interventions, like group counseling, with lifestyle guidance and nutritional education. The program offers Veterans a range of tools—for example, food journals, a mobile app to track diet and exercise, and, in some cases, access to gyms.

Studies have shown that participants in VA-MOVE! typically achieve modest, short-term weight loss—with an average of 0.28 lbs. to 7.3 lbs. at the one-year mark.

Aleman says a typical weight-loss goal might be losing 5% of your baseline weight within 3 to 6 months. For a 200-pound Veteran, that would be 10 pounds.

"I tell my Veteran patients that even though 10 pounds doesn't sound like a large amount of weight, it is the type of weight loss that tends to be sustainable. It will also help with health complications, which is really the goal."

The NY-MOVE! weight management clinic uses a team-centered approach to care that includes access to psychologists, nutritionists, and physicians who are trained in obesity medicine and endocrinology. The clinic provides individual or group counseling and weight-centered management of type 2 diabetes.

Drugs, surgery are options for some patients

Many years ago it became clear to scientists that weight-loss therapies that used only lifestyle interventions—like diet and exercise—would not work for everyone. That's where medications and surgery come in.

Read more at www.research.va.gov/currents ★

MVP study shows ability of genetic tool to screen for breast cancer



Photo by Michael Moody

Dr. Shiu-Wen Luoh led a study using MVP data to validate a new genetic risk model for breast cancer.

A study by VA's Million Veteran Program showed that a genetic risk model could accurately predict breast cancer in a large group of women Veterans. The tool assesses patients' DNA for many different genetic variations that, when added together, can elevate a woman's lifetime risk of breast cancer to 20% or higher, a trigger which usually calls for more actions in current practice.

By scanning a patient's genome for gene variants using this tool, doctors can create individualized breast cancer screening and risk-reduction plans.

The [results](#) appeared in the July 21, 2021, issue of *JCO Precision Oncology*.

Refining breast cancer screening strategies

Breast cancer is the most common form of cancer for American women. Although mammogram screenings have lowered the number of deaths from breast cancer, better screening methods could help determine risk and help prevent the cancer before it develops, according to the study researchers.

Previous genome-wide association studies—studies that examine the genes of many people for shared traits related to disease risk—have identified multiple gene variations that appear to increase the risk of breast cancer.

While studies have shown that genetic testing for these variations can help predict breast cancer risk, it is less clear whether they would be as accurate for women Veterans. Veterans experience different environmental exposures

and psychological stressors than the general population because of their military service, which may affect disease risk.

By evaluating women Veterans' individualized genetic risk for breast cancer, specific screening plans could be developed for each patient, according to Dr. Shiu-Wen Luoh, who led the MVP study. "The goal is to find the right amount of screening that's not too expensive and not too emotionally burdensome," explains Luoh, "but also effective at detecting breast cancer early in woman with that specific risk."

Luoh is a researcher with the VA Portland Health Care System and the Knight Cancer Institute at the Oregon Health & Science University. Dr. Sally G. Haskell of the VA Women Veterans Health Care program and Dr. Cindy Brandt, both with the VA Connecticut Health Care System and Yale University, co-led the research project.

If genetic testing can help determine a woman's risk for breast cancer, then prevention and screening measures can be tailored to her needs. "Some women may need a mammogram more frequently than every one to two years," says Luoh. "For others, in addition to mammogram, they may need abbreviated MRI, a shorter form of the scan that studies have shown could be effective and less expensive than a full MRI. Maybe some women may need less frequent screenings and/or don't need to begin regular mammogram screening until later if their risk is lower."

To better home in on these specific risk factors, Luoh and colleagues turned to a tool called the Individualized Coherent Absolute Risk Estimator (iCARE). [iCARE](#), developed outside VA, is a computer program that allows researchers to build and evaluate models of risk based on multiple data sources. The models can

then be used to estimate an individual's risk of developing a disease.

The researchers used iCARE and incorporated a model of breast cancer genetic risk based on 313 single-nucleotide polymorphisms. A single-nucleotide polymorphism is one genetic variant at a specific location on the DNA molecule. The variants used in the model have previously been shown to modify breast cancer risk.

Luoh's team applied the prediction model to the genomes of more than 35,000 women Veterans who had volunteered for MVP. Of those, 338 developed breast cancer during an average follow-up of four years. The screening tool proved to be highly accurate at predicting breast cancer risk, especially in women

with European ancestry. Because more data is available on this population than for women of African ancestry or other minority groups, the results cannot be generalized to all populations.

"The goal is to find the right amount of screening that's not too expensive and not too emotionally burdensome, but also effective at detecting breast cancer early in woman with that specific risk."

of European ancestry, more work is needed to determine genetic risk factors of breast cancer in non-White Veterans. Most of the research that established the connection between breast cancer and the 313 gene variants was conducted with primarily white participants. It may be that these DNA locations are also involved in breast cancer risk for Black women, says Luoh, but it's also possible that genes that increase risk are located elsewhere on the genome in Black women.

Read more at www.research.va.gov/currents ★

VA to collaborate with National Institute of Allergy and Infectious Diseases



Photo by Lupe Hernandez

VA's Dr. Sunil Ahuja (left), seen here in a file photo with collaborator Dr. Matthew Dolan, is leading a joint project with NIAID to learn more about the factors that affect the severity of illness from COVID-19. The study is part of an expanding partnership between the two agencies.

A new agreement between VA and another federal agency will expand research on infectious diseases and related topics. The partnership is expected to benefit Veterans and all Americans, as well as people around the world.

VA signed a memorandum of agreement with the National Institute of Allergy and Infectious Diseases (NIAID) on June 28 to expand collaborative research.

NIAID is part of the National Institutes of Health. It is a world leader in research on infectious, immunologic and allergic diseases. Research funded by NIAID has led to numerous therapies, vaccines, and diagnostic tests. The head of the agency, Dr. Anthony Fauci, has become well-known to Americans for his leadership in the public health response to COVID-19.

Dr. Victoria Davey, VA's associate chief research and development officer for epidemiology and public health, says the hope is that the partnership will "improve VA's ability to care for Veterans and improve the health and lives of Veterans and others throughout the U.S. and the world."

Building on existing collaboration

VA and NIAID already collaborate on infectious diseases and immune system disorders. The agencies, as part of a broad international public-private partnership, work together on the [Accelerating COVID-19 Therapeutic Interventions](#)

[and Vaccines](#) initiative. The research has been evaluating the safety and effectiveness of antibodies and anti-viral medications targeting COVID-19, with Veterans being enrolled in trials at several VA medical centers.

Moreover, NIAID directly funds some 170 research projects at VA medical centers. These studies cover topics such as HIV, asthma, and drug-resistant “super bug” infections.

The new agreement will “continue and preserve” these efforts while promoting “greater synergy” by further leveraging the unique strengths of each agency. The formal agreement notes VA’s expertise in clinical trials, informatics, and genomics, among other areas.

Leveraging momentum from the pandemic

Dr. Rachel Ramoni, who heads the VA research program, notes that the new partnership was given momentum in part by the pandemic.

“We began strengthening our partnership with NIAID in the early days of the COVID-19 pandemic, mainly around clinical trials, and now we are looking at many other areas in which we can join forces,” she says.

The agreement will make it easier for researchers with VA and NIAID to share lab specimens, data, methods, and other resources. It will also involve new training opportunities such as workshops and seminars across the two agencies.

An initial set of joint projects expected to be launched through the agreement will focus on COVID-

19. Some will test potential new treatments based on antibodies or antiviral drugs as part of ACTIV. Others will analyze data on VA patients to learn about viral mutations—such as the Delta variant now spreading across the U.S. and much of the world—and vaccine effectiveness.

Taking a broad look at factors impacting COVID illness severity

One project already underway between the two agencies is a study led by Dr. Sunil Ahuja at the South Texas Veterans Health Care System. His group is following patients hospitalized with COVID-19, as well as accessing data from routine screenings and monitoring of health care workers caring for COVID patients. Ahuja and colleagues are focusing on two measures they believe help explain why the virus affects people so differently, with some experiencing only mild illness and others getting very sick. One factor is an impaired immune system. The other involves inflammation and tissue damage in the airways. Ahuja’s team is also studying postmortem specimens and mice as part of their investigation.

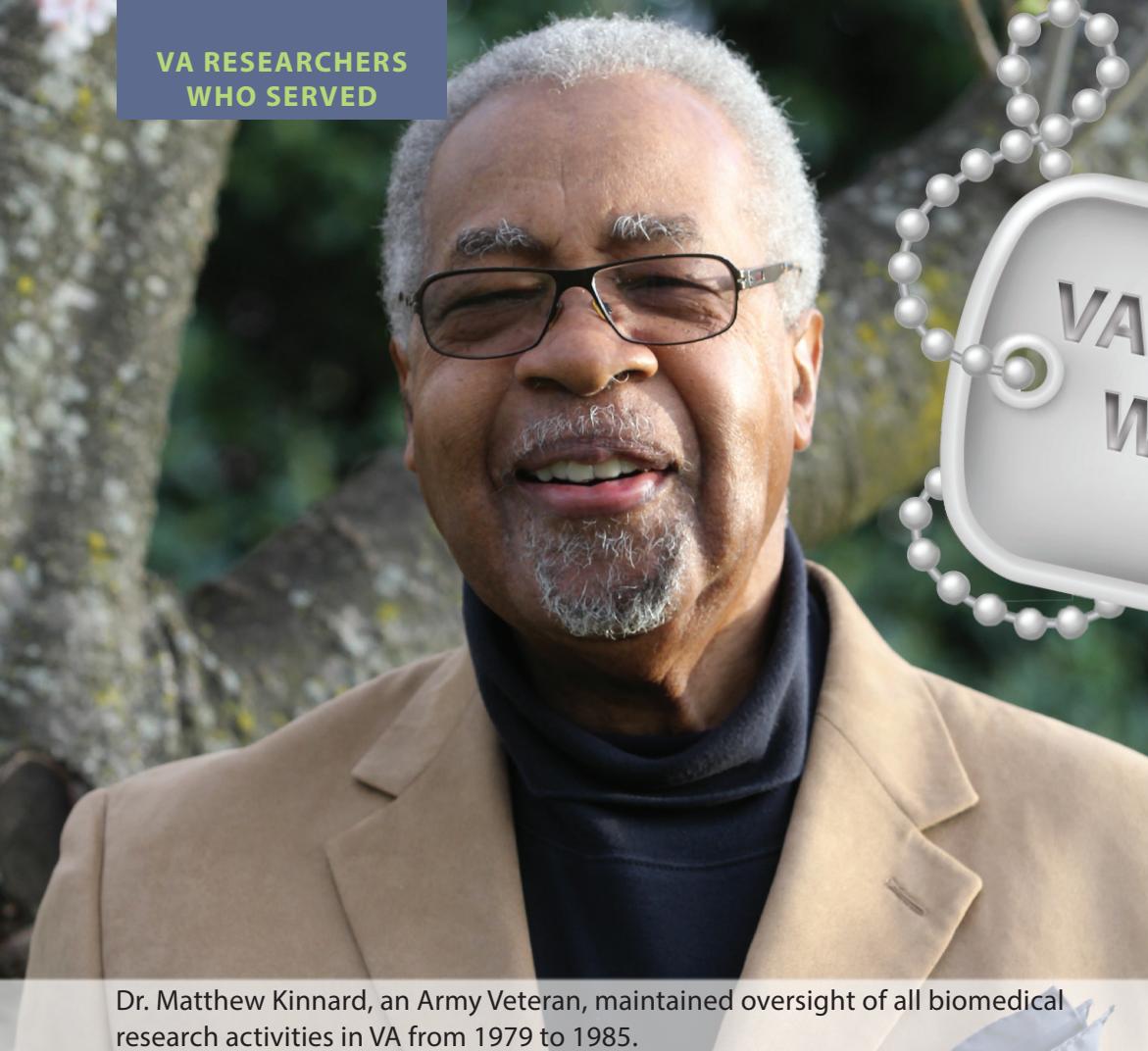
Besides COVID-19, the VA-NIAID agreement will cover “a wide range of infectious, immunologic, and allergic diseases of common concern.” Davey says the partnership should lead to better care across all of these conditions. In particular, she foresees more impact from VA research in this area.

Read more at www.research.va.gov/currents ★



SAVE THE DATE: VA RESEARCH WEEK

May 15-21, 2022



Dr. Matthew Kinnard, an Army Veteran, maintained oversight of all biomedical research activities in VA from 1979 to 1985.

VA Researchers Who Served: Dr. Matthew Kinnard

Dr. Matthew Kinnard, an Army Veteran, maintained oversight of all biomedical research activities in VA from 1979 to 1985 as chief of field operations for the VA Medical Research Service, which is today the [VA Office of Research and Development](#). In his 43-year career in the federal service, he also carried out basic neurophysiology research on warm-blooded animals at the National Institutes of Health and served as a health scientist administrator for the National Institute of Dental Research and the National Institute of Child Health and Human Development. He served in the Army from 1959 to 1962 at the Water Reed Army Institute of Research, conducting lab research on viruses transmitted by insects. After retiring from the federal service in 2006, he worked as an adjunct professor of anatomy and physiology at the University of the District of Columbia for more than 10 years. He continues to serve as a science consultant for women and underrepresented minority institutions and as a mentor for students from high school through graduate and professional school.

What motivated you to join the military?

Based on my date of birth, it was my civic obligation to serve in the military, which I willingly did. I enlisted instead of being drafted so I could choose my permanent military occupational specialty, rather than risk being relegated to an advanced infantry unit. However, I mistakenly signed up for advanced training as a hospital medical nurse or as a corpsman treating and rescuing field casualties.

When I reported to Walter Reed Army Medical Center in 1959, as good fortune would have it, the placement officer

noticed that I had earned a master's degree in biology and offered me the chance to work in a lab designed to conduct Army research. Among the people who inspired me to fulfill my military obligation were my high school physical education instructor, himself a Korean War Veteran; several uncles and older cousins who had served and were serving in different branches of the military; a cousin and a brother-in-law, both of whom were original Tuskegee Airmen; and the entire air science (ROTC) faculty at Tennessee State University (TSU) that introduced me to a potential career in the U.S. Air Force.

What inspired your research career?

My inspiration for a research career started with my high school principal and professors, my college professors at TSU, and my co-workers at my permanent military duty station, Walter Reed, including Major Cliff Arrington, an African American. One person in particular was Jimmy Evans, a brilliant African American civilian microbiologist at Walter Reed, now deceased. Although he never formally earned a doctorate, Mr. Evans earned two master's degrees in microbiology. My inspiration continued with senior staff members of the National Institute of Mental Health and the National Institute of Neurological Diseases and Blindness.

Did you have mentors who inspired you in life, the military, or your research career?

Yes, at all stages of my career development. They included family members and Dr. Estelle Ramey, my graduate adviser at Georgetown University, where I earned a doctorate in 1971. When and where did you serve in the military? Describe your military experience.

I was at Fort Jackson in South Carolina, Brooke Army Medical Center in Texas, and the Walter Reed Army Medical Center in Washington. Fort Jackson was



Matthew Kinnard at Fort Jackson in South Carolina in 1959

physically challenging but necessary. Despite the fact that 60 years have elapsed since my basic training, I recall that the training cadre there consisted of a paratrooper company commander and an airborne ranger executive officer. Half the cadre of drill sergeants included former paratroopers. To further punctuate my basic training experience, my training unit was squarely atop the infamous "Tank Hill." I think that sums up the physical challenge pretty good.

Brooke Army Medical Center was very collegial and friendly compared to Fort Jackson. Walter Reed was educationally and socially beneficial, since I met my spouse of now 58 years while stationed there. I also met many lifelong friends at Walter Reed with whom I still associate. I particularly enjoyed the camaraderie of participating in all types of extramural sports and the civilian-like atmosphere, in general. Also, during my stint at Walter Reed I discovered the National Institutes of Health (NIH), the institution that heretofore was a total mystery to me. My research interest was sharpened when I enrolled in advanced evening science courses offered by NIH. I had the chance to meet some people already employed by NIH.

Read more at www.research.va.gov/currents ★



RESEARCH CURRENTS

Research News from the U.S. Department of Veterans Affairs

VA scientist, molecular biologist, blazed new trails in space

In June 1991, Dr. Millie Hughes-Fulford flew on NASA's first space mission dedicated to biomedical studies. The VA molecular biologist spent nine days aboard the shuttle Columbia, conducting experiments on the effects of space travel on humans. She and her crew flew more than 3 million miles while orbiting the Earth nearly 150 times, acquiring more medical data than any prior NASA flight.

The research shaped the rest of her career. Upon returning, she established the Hughes-Fulford Laboratory at the San Francisco VA Health Care System. The lab conducted experiments about the impact of weightlessness on astronauts' immune systems and the loss of bone mass.

That work led to studies on the effects of space flight on bone and T-cell dysfunction on later shuttle and Space-X missions and at the International Space Station. T cells are important white blood cells of the immune system and play a key role in immune response. [Read more at www.research.va.gov/currents](http://www.research.va.gov/currents) ★



Photo courtesy of NASA



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