## This Issue: The Returning Veteran

### From the Chief Research and Development Officer

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#### VA Researchers Honored with Presidential Award for Early Career Scientists

#### VA Research Career Scientist Named 2016 AAAS Fellow

#### Dr. Michael Charness Honored for Contributions to Understanding Alcohol’s Impact

#### VA Researchers Honored for Work on Psychiatric Disorders

#### VA’s Middleton Award to Researchers Studying Bone Diseases, Cancer

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Any health information in this newsletter is strictly for informational purposes and is not intended as medical advice. It should not be used to diagnose or treat any condition.
Progress and transformation

As VA’s new chief research and development officer, I sense we are entering an exciting time for the Office of Research and Development and the department as a whole. There will be many opportunities to work with the new administration and President Trump to continue what we do best: conduct innovative research and develop cutting-edge medical treatments for our nation’s Veterans.

VA has experienced significant challenges over the last several years, as public trust in our health care systems and providers has flagged. In response, we have rededicated ourselves to our mission to provide timely care and more effective services, and to become more responsive to the 21 million Veterans whom we serve.

Over the last several years, VA has instituted many changes and new processes that have yielded solid results. These are a few VA accomplishments that show we continue to make steady progress toward improved care for our Veterans:

• In a June 2016 survey, 60 percent of Veterans said they “trust the VA to fulfill our country’s commitment to Veterans,” up from 47 percent in December 2015;

• In a memo dated January 2017, (then undersecretary of health) Secretary of Veterans Affairs David J. Shulkin, M.D., announced that Veterans now have same-day service for primary care and mental health care in all 166 VA facilities; and

• A study conducted by the RAND Corporation and published in the Journal of General Internal Medicine concluded that VA performs better than or equal to private-sector health care systems in the areas of safety and effectiveness of care.

It is our intent to continue these improvements in care delivery, as well as continue the important contributions to medical research that VA is known for.

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VARQU investigators have a long tradition of groundbreaking research that has made possible remarkable innovations in medical care — for example, the nicotine patch, the first implantable cardiac pacemaker, the shingles vaccine, and the first liver transplant. Our scientists and clinicians also lead the way in important discoveries uniquely suited to our Veterans, like designing new prosthetic limbs and discovering more effective treatments for PTSD.

This issue of VARQU is dedicated to medical research that will help VA better care for the “Returning Veteran.” For instance, in “Spotlight on Career Development Awardees” we speak with Dr. Patrick Aubin, a research investigator who works in the Center for Limb Loss and Mobility at the VA Puget Sound Health Care System in Washington state. Aubin is working on designing a prosthetic lower limb that will help Veterans who have lost a leg walk with less physical effort. He and his team are using computer simulations to test their designs before they even construct a prototype to be field-tested in the lab, by Veteran prosthesis users.

A strong VA research program is vital to the health and well-being of all Americans, not just our Veterans. I look forward to rolling up my sleeves and getting to work.

Rachel B. Ramoni, D.M.D., Sc.D.
Chief Research and Development Officer
VA researchers study lung health in returning Veterans

Under the umbrella of **VA’s Cooperative Studies Program**, VA has funded research to assess the lung health of 4,500 Iraq and Afghanistan Veterans. The study, expected to be launched in 2017, is titled “Service and Health Among Deployed Veterans (SHADE).”

The objective of the study is to find out whether exposures to air pollution during deployments to U.S. bases overseas are associated with poor lung function. Of greatest concern is PM2.5, which are particles smaller than 2.5 microns in diameter that can lodge deep in the lungs of Veterans. Researchers will also examine the connection between exposure to PM2.5 and the development of asthma.

This study will:

- enroll a group of up to 6,200 Veterans and conduct an in-person assessment of lung function;
- create an exposure grid of environmental PM2.5 levels at locations where military personnel served;
- link each Veteran’s location and duration history with average PM2.5 exposures during each of these time periods; and
- conduct analyses to test hypotheses linking cumulative PM2.5 exposure to current respiratory health.

Preliminary research, to help lay the groundwork for SHADE, is reported in three studies by VA researcher Dr. Eric Garshick and colleagues in the *Journal of the Air & Waste Management Association*.

In these studies, VA researchers are developing methods to estimate

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A soldier with the 1st Cavalry Division wears a mask to protect himself from a dust storm in Baghdad, Iraq, in 2009. *Photo by Edwin L. Wriston, U.S. Navy*
exposures from dust and sandstorms for U.S. troops who fought in Iraq and Afghanistan. The goal is to build reliable tools for epidemiologists to evaluate the relationship between respiratory health in Veterans and exposure to air pollution. To read about the work they are doing see: “Satellites, airport visibility readings shed light on troops’ exposure to dust storms, pollution.”

Million Veteran Program assists in genome-wide studies

In collaboration with VA’s Million Veteran Program (MVP), Dr. Murray Stein at the VA San Diego Health Care System and Dr. Joel Gelernter of the VA Connecticut Health Care System are leading a research effort to look into the genetic underpinnings of posttraumatic stress disorder.

The team will conduct one of the largest genetic studies of PTSD, with the aim of improving understanding of PTSD neurobiology and the genes that could influence development of the illness in Veterans exposed to combat-related trauma.

Stein, who is considered an expert in the field of PTSD and anxiety disorders, has conducted many large-scale studies into PTSD. One such study, published in JAMA Psychiatry, used two data sets from the Army Study to Assess Risk and Resilience in Service Members (STARRS), which comprised 13,690 service members. About 18 percent of the Veterans enrolled in the study reported a diagnosis of PTSD.

In previous studies, researchers examined the entire genome of study participants — a method referred to as a genome-wide association (GWA) study — to see if they could identify genetic variants that might influence the development of PTSD. They also looked for specific genes known to affect the body’s response to stress. They did not find genome-wide evidence that applied to all races and that could be replicated across different studies. But they did find evidence of an association for the gene ANKRD55 with PTSD.
in African American service members.

Stein points out that GWA studies thrive on huge data sets. “MVP is a marvelous resource for the field. It’s going to be a lot of help,” he says. “Initially people were focused on dopamine genes and some others, because it was thought that’s where the biology was. But then these large GWA studies pointed them in directions nobody would have thought of if those prior studies hadn’t been conducted.”

To find out more about VA work on PTSD gene studies read “Hot on the Trail of PTSD Genes.”

**VA Research announces new PTSD Psychopharmacology Initiative**

VA has announced a new initiative to spur innovative research into drugs that can be used to treat PTSD in Veterans, called the PTSD Psychopharmacology Initiative (PPI).

In June 2016, VA convened an expert panel to review the body of available research on PTSD and drug treatments. The panel identified significant gaps in VA’s work to identify and test the most effective drugs to treat PTSD in Veterans. The review led to the new call for research proposals as well as other elements, such as training opportunities and clinical site surveys, to address this priority research need.

“Considering the wide-ranging impact of PTSD from a personal, health care system, and societal perspective, VA must have a focused research program to systematically address the need for a rich PTSD pharmacotherapy evidence base,” said Dr. Terri Gleason, acting director of VA’s Clinical Science Research and Development Service (CSR&D). “We consider this effort to be one of the highest priorities for our clinical trials program and are counting on the scientific community to engage in this effort. CSR&D also convened an Industry Day to attract commercial partners in September 2016, and several new studies are being developed as a result of that activity. We further hope to develop more partnerships as the PPI moves forward.”

The PPI invites research proposals on PTSD medications from qualified VA investigators. There is an opportunity for clinical trials training for VA investigators interested in conducting studies in this area. Also, sites are
encouraged to complete surveys to address capacity needs for potential clinical trials.

VA research has a rich history of studying and developing PTSD treatments, including psychotherapies such as cognitive processing therapy, which is currently used widely in VA, along with prolonged exposure therapy. Ongoing studies range from investigations of the genetic or biochemical foundations of the disorder to evaluations of new or existing treatments.

For more information on the PPI, visit the CSR&D website. To learn more about VA research on PTSD in general, visit our PTSD topic page.

VA research program to look for new drugs to treat posttraumatic stress disorder. Photo:@iStock/motorolka
Improving care for Veterans with substance use disorders

Dr. Keith Humphreys is the associate director for the Health Services Research & Development Center for Innovation to Implementation in Palo Alto, California, and professor, department of psychiatry, Stanford University School of Medicine. He is also the principal investigator for a VA HSR&D CREATE initiative, which is a group of interrelated research projects. Humphreys’ CREATE focuses on care innovations for substance use disorders: Enhancing the Value of VA’s New Uniform Package of Health Services for Substance Abuse.

Dr. Michael Cucciare is associate director for research training at the South Central Mental Illness Research, Education, and Clinical Center (MIRECC) in Little Rock, Arkansas, and assistant professor, department of psychiatry and behavioral sciences, College of Medicine, University of Arkansas for Medical Sciences. He is also the principal investigator for the VA-funded study: Web-based Intervention to Reduce Alcohol Use in Veterans with Hepatitis C.

VARQU spoke with the two researchers about their work on substance use disorders among Veterans.

VARQU: Dr. Humphreys, can you tell us about the VA CREATE that you are spearheading?

Dr. Humphreys: The CREATE is an interconnected suite of projects that were co-designed by HSR&D experts in addiction and our operations partners at the Office of Mental Health Services, Office of Mental Health Operations, and Office of Public Health. One study is focused on quality measurement; one is focused on the different types of funding mechanisms; one is focused on engaging the population of Veterans who go through many,
many detoxifications, trying to get them engaged in treatment; and the last one is the hepatitis C one, which is Mike’s brainchild. Liver clinic staff know that they see a lot of people with alcohol problems, but they don’t have a lot of time to deal with them. So the idea is to develop some technology which would extend the impact of the staff by giving the Vets direct access to the tool which would help them understand their drinking and maybe consider making a change.

**What is the overall prevalence of substance use disorders in the Veteran population?**

**KH:** We know a couple of things about Veterans as a whole — the 23 million people who have served — not just those who use the VA health system. About one in five smokes tobacco, which is more than the general population. About 22.6 percent binged on alcohol use in the last month, which means they sat down and drank five or more drinks at a sitting. About 7.5 percent are heavy alcohol users, meaning in the last month alone, they drank five or more drinks at a sitting, at least five times. And about 4.5 percent used illicit drugs in the last month. All of those things are higher than you would see in a comparable group of non-Veterans. If you match a non-Veteran population by gender and age, Vets do seem to use more substances.

When you look at the VA health system using population — about a third of the total Veteran population — that’s even more the case. In our patients, substance use disorder involving tobacco, methamphetamine, alcohol, cocaine, heroin, lately OxyContin and things like that, are some of the most common and costly chronic conditions that we face in the health care system. These Veterans who seek treatment at a VA facility tend to be more ill, obviously. They tend to have lower incomes, and they have more substance use problems than do the Veteran population as a whole.

**Are Veterans who experience chronic illnesses at greater risk for substance use disorder? And do Veterans with substance use disorder tend to become sicker?**

**KH:** Both things are probably true. But it’s also true that the severity of substance use disorders and the response to treatment is often connected to how much social capital people have. So people who have more education, better jobs, better marriages, and better income are more likely to have a good outcome from treatment. The VA is a safety net provider, so we serve a lot of people who have fewer of those things. And that would include people who have been treated many times, and relapsed many times. They have very challenging lives.

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Does this susceptibility vary for Veterans who have served in a theater of war, like Operation Enduring Freedom or Operation Iraqi Freedom (OEF/OIF)?

KH: Yes, each cohort has had its own experiences with substances. If you go back to World War II, Korean War-era Vets, alcohol use disorder overwhelmingly dominates. If you look at Veterans who served in Southeast Asia, Vietnam, I would say many experienced exposure to opiates and cannabis. Particularly opiates. There was very pure, very cheap heroin in Vietnam. That’s where a lot of the drug treatment concern came about in the U.S. in the 1970s, from the Veterans who were addicted to heroin in Southeast Asia.

In the more recent conflicts — I should say I’ve been to Iraq — there wasn’t a lot of exposure to illicit drugs (at least in the early years) because Iraq was a very conservative society and had militarized borders. But there are a lot of pharmaceuticals loose in Iraq, and that includes leakage out of the corrupt Iraqi pharmaceutical system, but also from prescribed prescriptions from Army doctors. Soldiers are getting more potent opioids than they’ve ever had before. And sometimes they desperately need them; I’m not saying it’s wrong. But when you get a serious injury and are prescribed a lot of opioids in your transition out of the service, you are at risk of having an enduring problem. So the young men and women soldiers are far more likely to have a prescription drug problem, which makes them different than what VA has seen in the past with the Vietnam, Korea, and World War II Veterans.

Do the substance use problems for Veterans differ by gender? There are now many more women in the military than, say, during World War II.

KH: If you look at the world, men use more substances than women. That’s true for every place on Earth. It’s true in the United States. So given that the military has more men, you are going to have a lot more substance use, especially among young men. But one of the interesting things is that while male Veterans use more substances than male non-Veterans, the difference between female Veterans and female non-Veterans is even higher.

When you look at the Vietnam data, the rate of alcohol dependence among women who served in Vietnam was something like five times higher than women who didn’t. The differences for men weren’t that big. So we might see more substance use disorders in women Veterans relative to women in general. Even if most Veterans are male, the women who have served and are coming in [for treatment at VA] are a lot more likely to have trouble
than are women outside. And so that is something unique to their gender, relative to the men, where men are somewhat more likely [to have substance use problems], but not wildly more likely.

Dr. Cucciare, can you tell us about the research that you are doing for the CREATE study which looks at substance use interventions for Veterans with hepatitis C?

Dr. Cucciare: This study is a two-site clinical trial. The focus of it is really to determine whether a brief intervention delivered on the computer essentially one time is effective for reducing alcohol use in Veterans who have consumed any amount of alcohol in the past 30 days, and also have hepatitis C. We’ve actually broadened that out to include Veterans with any liver disease. The intervention we’re using is borne out of the college drinking literature. There’s a lot of literature over the past 10 even 15 years using very brief, one-time, computer-delivered interventions to reduce binge drinking in college students. As we all know, that can be a problem in that setting. We’ve slowly applied that intervention to the larger population using a public health approach, where you try to get that intervention to as many people as you can. The intervention we’re using is very brief, and it tends to have very small effects. So you are not taking someone who has an alcohol use disorder and making them abstinent. But these interventions tend to reduce, for example, the frequency of binge drinking, which we know is terribly harmful to your health. So even reducing that even a little bit can be helpful in the long run.

That’s what we are doing in this study, taking this very brief intervention and putting it in clinics, in San Francisco and Palo Alto VA liver clinics. As Dr. Humphreys mentioned before, the reason why we have interest in doing this is these clinics are terribly busy. They have many clinical issues to address when these patients come in, especially with these new anti-viral treatments being implemented in VA. More and more Veterans are coming in and wanting information about those interventions, and wanting that treatment.

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How is the intervention structured?

MC: It takes about 20 minutes for the Veteran to go through the intervention from start to finish. And it consists of two parts: there’s a brief assessment of their alcohol use and some of the consequences of their alcohol use. That information is then given back to the Veteran in the form of personalized feedback. So a piece of that feedback is letting the Veteran know, compared to other men or women your same age, here’s how your drinking compares to them. And it also lets them know feedback about the health effects of drinking on their liver, on the efficacy of the anti-viral therapy, although that’s staring to change now with the new treatments.

It tries to tailor the feedback specifically to help the Veteran understand how drinking can affect their disease. That’s really what it is targeting. And then they can print out a feedback report that they can take with them. So even though the intervention is short, they can take that material with them, read it, and try to digest it. And if they desire, they can bring it back and discuss it with their physician during a visit.

How often do patients need to go through these interventions to benefit?

MC: That’s a good question, and I think largely the literature says there is some benefit to doing them one time. I don’t think that the literature has come to any conclusions about frequency. There’s some debate on whether multiple, brief interventions over a period of time have any additional benefit. That first time is really where the bang is, especially with these kinds of interventions, these personalized interventions. There are other brief interventions where that is not the case. So it’s one time and then they take that information and go with it. And then we follow them for six months to see if there’s any change.

The study abstract says that this intervention makes liberal use of pictures and graphs. Why is that?

MC: Before we jumped into the clinical trial, we did a lot of work to try to update and revise the intervention to make it look new, to make sure that we were giving Veterans content in a way that was digestible. It wasn’t text-heavy, but as you say, it had images and graphs that were easy to understand and comprehend. So we did a lot of upfront work to make sure the intervention was understandable, that Veterans liked it, and could understand the content, before we actually started this larger trial. I think it was critical before we jumped into the study looking at effectiveness.
A Chat with Our Experts

**KH:** I agree with that. I think it’s important to mention that’s what VA and HSR&D supported, in part, was making sure that the intervention would fit the people we were taking care of.

**Your study mentions that there are newer drug therapies being used to treat hepatitis C, which have fewer side effects than older drugs. How is that changing your work with Veterans?**

**MC:** That’s a very good question. The short answer is we are not entirely sure yet. It has been a moving target. The VA has been really at the forefront of implementing these wonderful treatments for hepatitis C, which in my understanding require the Veteran to take them for shorter periods of time. They also have fewer side effects and fewer contraindications, so more people can take them who have more health conditions. How that’s affecting this study has been a big question over the course of it. One thought is, it is perhaps changing the landscape of the clinic a bit. The characteristics of users, the people coming into these liver clinics have changed. And we are not entirely sure what that means.

For example, in some of our recruitment efforts in some of the clinics, at different times, we have noticed that the number of Veterans who have been drinking, at least more recently, has declined. That isn’t based on any big study. This is sort of our anecdotal observation of what we are seeing. I don’t know if this is across the nation, or if it pertains just to the two clinics where we are doing our study.

It does seem to be apparent that the characteristics of Veterans who are coming in for treatment are changing a bit. I think we’ll start to learn more as researchers start to investigate the characteristics of Veterans that are coming in now, and we’ll start to see bigger papers come out of the national VA data looking at that research question.

**Why is it that Veterans with hepatitis C have higher rates of alcohol use disorders?**

**MC:** I thought long and hard about it when you sent the question to me. It is true — we do know Veterans with substance use disorders have high rates of hepatitis C infection and vice versa. And the literature shows us that having a substance use disorder is really a predisposing factor for hepatitis C infection.

But to my knowledge the exact pathways by which having a substance use disorder may put you at risk for hepatitis C infection have remained unclear.

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A Chat with Our Experts

It really hasn’t been spelled out in the literature. Certainly we can speculate about that: having a substance use disorder puts you at greater risk for activities, for example, that might lead to exposure to hepatitis C or HIV—like unsafe sex.

KH: You engage in behaviors that might convey risk, but you are still not going to get hepatitis C or HIV without the virus. One thing that is strongly suspected for HIV acquisition is that the heavy alcohol use suppresses the body’s immune response. I am not a gastroenterologist or hepatologist, so I don’t know if that is true of hepatitis C or not, but it wouldn’t be surprising.

So does this mean that your study is very important for this subset of Veterans who are heavy alcohol users?

MC: Yes, I think that is true. Especially pertaining to liver health, there’s evidence that suggests that even low or moderate drinking can harm the liver in people with hepatitis C. So what might be low-risk drinking for a healthy adult in his 40s, would not be low-risk drinking for an adult in his 40s with hepatitis C. Even beyond having an alcohol use disorder, for people who are consuming even low to moderate levels of alcohol, I think there is benefit in reducing that level of alcohol use as well.

KH: Our VA partners are committed to roll this intervention out if it works. That was one of the key points of the CREATE project. We aren’t doing this because we are trying to prove a theory or just get another paper on our vitae. This is something affordable, scalable, and if it works, VA is committed to giving this to everybody, and giving it to other health care systems too if they want to use it. All the clinics can have it for free, as far as we are concerned.

Isn’t that often the case, that VA innovations are eventually adopted in the larger medical community?

KH: Yes that is often true. In fact, that’s been particularly true in addiction. If you look over the last 40 years, it is very, very hard to think of a psycho-social treatment or a pharmacotherapy for addiction that was not tested in the VA. The critical studies on disulfiram, buprenorphine, naltrexone, some of the classic studies on cognitive behavioral treatment and 12-step treatment programs, were all done in the VA. VA has been a leader in substance use disorders for half a century. So this is definitely a good springboard. If this works, I think VA has the “cred” to help this translate to people outside our health care system who are trying to work with people who have problems with substances.
Building a better artificial limb

Dr. Patrick Aubin

Dr. Patrick Aubin is a research investigator with the VA Puget Sound Health Care System in the Rehabilitation Research & Development (RR&D) Center for Limb Loss and Mobility (CLIMB). He is also an affiliate assistant professor in the department of mechanical engineering at the University of Washington. Dr. Aubin received his Ph.D. in electrical engineering, with a focus on robotics and controls, at the University of Washington. After completing his Ph.D., he received Fulbright and Whittaker International grants to carry out a research project in Lithuania for two years. Returning to the U.S. in 2013, he completed a postdoctoral fellowship at the Wyss Institute for Biologically Inspired Engineering, Harvard University, working to develop “soft” exoskeletons, or exosuits, to help soldiers in the field walk with heavy loads.

Dr. Aubin, what type of work is being done at CLIMB?

Our center’s mission is to preserve and enhance mobility in Veterans and others with lower-limb musculoskeletal impairment or limb loss. Basically we focus on helping people walk better. There’s a biomechanics thrust, which is addressing the problems that come with arthritis and diabetes, preventing it and having improved treatments for it. And then there is the prosthetic and rehabilitation thrust, which is what my Career Development Award (CDA) is under. We are developing state-of-the-art prosthetic legs to help people walk better. We have about eight principle investigators, and each of those people has a research team that works with them. I am one of those principle investigators.

What area of research is your Career Development Award in? What will you study?

We are trying to design a better prosthetic leg for people who have had lower-limb loss. It really just boils down to helping them walk better and giving them a solution that is better than current commercial devices.
There are many different types of prostheses, for instance those that a professional runner would wear. What would be the typical prosthesis that a Veteran who lost a lower limb would wear?

Our Veterans are prescribed legs that help them attain their goals and fit their lifestyles, which vary from individual to individual. For example, most people just need a foot that helps them do their daily activities, like grocery shopping, walking around the community, etc. Those feet typically consist of a socket, which is a hard shell that goes over the residual limb. That’s attached to what we call a pylon, which is typically an aluminum tube. And that connects to the actual prosthetic foot, which is typically carbon fiber — we call it a passive-elastic foot, meaning it can bend and flex, but it is not motorized in any way. Covering the foot is what we call the cosmesis, which is a flesh colored piece of plastic that looks like a foot. It is basically a shell. Those are the main components that make up a prosthetic lower limb.

What are the limitations of using a prosthesis like you describe?

If you think about an intact limb, there is a muscle that’s called gastrocnemius (GAS), and it actually couples what the ankle is doing and the knee is doing. It connects from the calcaneus bone, which is your heel below your ankle, to your femur (thigh bone), which is above the knee. People who have an amputation lose the function of their GAS. And typical commercial prosthesis, like the ones I just described to you — basically a socket with a pylon and a passive elastic foot — also do not have GAS function. So current commercial prosthetic feet are missing the coupling between the ankle and knee joint.

If you pick your foot up and flex your foot or tap your foot, you are using the GAS muscle to flex your foot down. And you use it when you walk. The GAS is unique; it’s what we call biarticular. That’s a key word in the title of my project meaning to span across two articulations. The term articulation is just a fancy word for a joint, so the knee and ankle are articulations. The GAS muscle helps you walk by coupling the knee and ankle joint and assisting with the push off phase of gait. Biologically we have this built-in coupling between the ankle and the knee, and that helps us walk very efficiently. That unique coupling is one of the factors that help us do all the amazing things that we can do in a mobility sense.
So a Veteran who is using a standard prosthesis would not have this coupling. What are some of the difficulties he or she might have when walking?

The standard prostheses on the market that one might wear, they are pretty good at allowing people to walk. The passive-elastic foot is pretty good; it recovers most of the walking function that someone would need. But it doesn’t do everything. One of the limitations that current amputees face, for example, is that they walk at a slower preferred walking speed. When they walk they expend more energy to walk. We call that the metabolic cost associated with walking. It is more difficult, more taxing for them to walk. It is more of a workout to do the same walking that you or I would do. They also have what we call a gait asymmetry, which just means that the limb that has been amputated is not mirroring in a variety of ways with what the intact limb is doing. One type of asymmetry would be ankle power.

What would be the benefits of wearing a biarticulated prosthesis?

One of the first aims of the project will be to understand what happens if we can restore the function of the GAS muscle. How will an amputee walk with that restored function, versus without it? That’s the first step, adding in that muscular function with prosthetic componentry and asking, “How does that change amputees’ walking?” We are hoping to find that it helps them walk with less energy — so the metabolic cost will come down. It will be easier to walk. As well as help reduce some of those asymmetries [in gait] that I mentioned. Specifically, at the ankle, it might help with push off power. We divide walking into several stages; at the very beginning is initial contact — that is where your foot hits the ground. At the end there is swing phase where your leg is off the ground. This prosthetic foot might help initiate the leg into swing phase, which is propelling the leg forward when an amputee takes it off the ground.

What I’ve described to you is the passive-elastic prosthesis. The opposite of that is a motorized prosthetic device which has a motor and a battery and would try to replicate how your ankle functions and pushes off the ground to help you walk. The device that we are trying to develop is between those two. It is a quasi-passive prosthetic device which consumes only a tiny amount of power for the onboard computer. A powered prosthesis has a motor and a battery delivering power to the...
foot to help it walk forward. The key elements of our device are a clutch and a spring. And that spring gets loaded through the natural kinematics of walking. As you walk, just as your GAS muscle would normally get stretched in late stance, we have a spring that’s replicating that function and is getting stretched. And then the energy that is stored in the spring gets returned to the user, to the ankle and to the knee. We are hoping to get some of the benefits of a powered device without powering it.

**How is your prototype made? What are the components?**

In its current incarnation, which will likely change in the next five years, you have a thigh cuff that allows the spring to be attached above the knee. And then there is a clutch that’s in series with that spring. The clutch engages at midstance, when you bend your knee so that in late stance, the spring gets stretched and stores energy. In late stance the energy in the spring is returned to the knee and ankle. During swing phase the biarticular element is passive to allow the user to get ready for the next step. The foot we are using is currently just a standard passive-elastic foot. It has a single pin joint at the ankle which allows for some dorsiflexion and plantar flexion of the foot. The key element is the spring and clutch which replicates how the GAS muscle functions.

**How does the clutch work in this prosthesis?**

A clutch is kind of like the brakes on your bike, so when the clutch is disengaged, it is like the brakes are turned off and the wheels can spin freely. In the prosthetic foot, when the clutch is disengaged the knee is not coupled to the ankle. The spring can move freely — it’s in what we call a transparent mode — so basically no energy is stored when the user moves around.

When the clutch is engaged, it is like the brakes locking onto the wheel, it stops the wheel from moving. For the biarticular foot it is simulating when the GAS muscle is active, the muscle locks up so that knee extension and ankle dorsiflexion stretch the GAS — so in the biarticular foot, the
clutch grabs on to the spring essentially. And then as you extend your knee it stretches that spring, much in the same way you would stretch your GAS muscle when you walk.

When you walk you are unconsciously doing this. Your muscles engage, they flex, they stretch, and they store energy like a spring. And then they recoil and that energy gets returned back to the joints. The clutch is basically replicating turning the muscle on and off — in the device there’s a computer that controls the clutch. The computer, which is about the size of a postage stamp, replicates the timing of the GAS muscle by measuring the gait cycle with sensors.

The key thing for our foot is it doesn’t have a heavy battery or a heavy motor. The spring is getting stretched through the natural walking pattern. That’s beneficial, because motors and batteries are expensive and they are also heavy and complicated. So we can eliminate those components from the device.

**How will you test the new prosthesis?**

First we build it, which is the phase we are in now. An interesting point is how we use simulation to inform the design of the device. If you think about how an airplane or car is built right now, engineers will first build a computer simulation of the system to test how it works. Say you were going to build an airplane wing. You first design and build the wing in simulation and test it in the computer model to see how it will perform, and then adjust it in the computer model until you are happy with the performance. Then you would build an actual prototype once the design has been optimized.

When you think about how we build devices that interact with humans, that step is not available. It’s very difficult to use simulation or computer modeling to help design a prosthetic device. We are very much stuck in a time (until now) where we actually build a prosthetic limb/foot and have someone walk on it and see how it works. And then build it again, until you get it right. You lose out on the benefits of computer simulated design — which means you can alter the design any number of times and see how it changes the performance or the function of the device, before you build an actual prototype.

One of the goals of this project is to use computer simulation during the design phase to find out how someone would walk on the new device. We
Spotlight on Career Development Awardees

have a computer model of someone walking, so we are hoping to build the device in the computer and then use these simulations to determine if it would be helpful to a lower-limb amputee.

Where do you see your research going in the next two to five years?
The CDA project goes for five years, and we are just getting started. For that project, success would really be developing a prosthetic foot that is commercially viable, that shows that it is beneficial over the current standard of care. Within the broader scope of my research program, I’m very interested in how we can augment human performance (walking performance in particular or mobility performance) through the use of robotic and artificial intelligence aids — basically anywhere there is a machine and a human user and they are working together.

I’m working on a smart walking cane right now for people who have knee arthritis. The idea is to take simple existing devices, like a walking cane or knee brace, and make them smarter and work better by exploiting recent advances in robotics, artificial intelligence, and mechatronics. So how do we make walking canes more effective and help people walk better? How do we make the human and the machine work together in a way that really benefits the users and makes it easier for them to walk? The overarching goal here is to increase people’s mobility so they can get out and do the things they like to do, simple things like playing with their grandchildren.
Homelessness among U.S. male and female Veterans linked to military sexual trauma — Researchers at the VA Salt Lake City Health Care System and VA’s National Center for PTSD found Veterans who had experienced military sexual trauma are at greater risk for homelessness once they leave military service. The retrospective study results were published in the June 1, 2016 issue of JAMA Psychiatry.

VA researchers reviewed medical data from the Department of Defense and VA belonging to 601,892 U.S. Veterans who served in Iraq or Afghanistan. They looked for signs of homelessness in Veterans 30 days, one year, and five years after leaving military service.

The study discovered 1.6 percent of Veterans who were exposed to sexual trauma during their service were homeless within 30 days after leaving the military. That rate went up to 4.4 percent within one year and was 9.6 percent within five years. That is double the rate for Veterans who had not experienced military sexual trauma. The study also found that men who went through military sexual trauma experienced higher rates of homelessness than women who had similar experiences.

The researchers said the study results underscored the importance of screening for sexual trauma in Veterans. Roughly 25 percent of female Veterans and 1 percent of male Veterans have experienced military sexual trauma. Not only is it a risk factor for homelessness, it is often related to serious mental health problems and can contribute to physical illness and substance abuse.
Spinal Cord Injury Vocational Integration Program — In two multi-center studies, VA researchers found that working one-on-one with Veterans who had spinal cord injuries (SCIs) using supported employment techniques had the best chance of success for job placement and continued employment.

In the first study, “Spinal Cord Injury Vocational Integration Program (SCI-VIP),” Dr. Lisa Ottomanelli and her team followed the progress of 201 Veterans who suffered SCIs who were seeking employment. The group was split into two parts: Veterans who received standard job search services and Veterans who received specialized support services. Researchers concluded that Veterans who were in the Supported Employment (SE) group were 2.5 times more likely to become employed than those in the control group.

The findings in the first study were used to build a second, longitudinal study that enrolled 213 Veterans with SCI during an episode of inpatient hospital care or outpatient care. Researchers followed subjects over a period of 24 months to determine the effectiveness of Individual Placement and Support (IPS) techniques to help them find and keep employment.

The study, “Predictive Outcome Model Over Time for Employment (PrOMOTE),” found that 43 percent of the Veterans who participated found jobs (92 participants); for those Veterans who had SCI and traumatic brain injury (TBI), the employment rate was 52 percent. In light of the study results, researchers recommended offering IPS services to all Veterans with SCI who were interested in finding jobs.

Because SCIs can affect many different areas of daily living, a large number of Veterans with these types of injuries have difficulty finding work and staying employed. Overall, the number of people with SCI who find and keep a job is only 9 percent. Researchers say that this percentage is even lower for Veterans who have suffered an SCI.

Ottomanelli is a clinical psychologist at the VA Center of Innovation on Disability and Rehabilitation Research (CINDRR) in Tampa, Florida. She has over 20 years of research experience in the area of disability and rehabilitation.
STEP-Home: Improving reintegration for OEF/OIF Veterans —

Researchers at the VA Boston Health Care System have adapted a civilian rehabilitation program to create a 12-week workshop to help Veterans who have returned home to the U.S. after serving in Iraq or Afghanistan. The aim of the “STEP-Home” workshop is to strengthen behavioral and emotional skills so that Veterans are better equipped to rejoin their families and civilian communities.

STEP-Home is a short-term treatment program (12 two-hour weekly group meetings, plus three to six individual sessions) based on a mild traumatic brain injury rehab program for civilians called STEP. STEP-Home meetings take key ingredients from the civilian program and modify them to better address problem areas for Veterans. The treatment topics adapted from the STEP program include problem-solving, emotional regulation, and attention training. Researchers added topics that Veterans are more likely to have problems with, such as vocational counseling, substance misuse, and anger management.

Because many Veterans struggle with moderating their emotions once they are back in the community, a typical problem addressed in a STEP-Home session is how Veterans can deal with anger directed at civilians, such as road rage. Memories of driving in military convoys can trigger feelings of threat in Veterans who are cut off or tailgated in traffic. STEP-Home trainers teach Vets a set of tactics they can use to regain control of their emotions using cognitive behavioral concepts. Vets are taught to identify the event (being cut off), their feelings (anger), their thoughts (I am under attack), and finally their behaviors (screaming at the driver). To stop the cycle of rage, Veterans are encouraged to think of alternate actions they could take to help them calm down and de-escalate the situation. For instance, pulling over and stopping the car so they can call another Vet to vent and get support.

In a recent feasibility study, 69 Veterans who had served in Operation Enduring Freedom (OEF), Operation Iraqi Freedom (OIF), or Operation
New Dawn (OND) were enrolled in STEP-Home. Most were referred from VA health clinics or research centers. A majority had some type of mental health condition — 86 percent were diagnosed with PTSD; 35 percent had at least one traumatic brain injury; and many had also been diagnosed with a mood, anxiety, or substance use disorder.

Of the 69 participants, 58 Veterans completed the STEP-Home workshop. Of those, 34 showed improvements in functional status as measured on a disability assessment tool. Significant gains in attention, problem-solving, and emotional regulation skills indicated positive change during treatment.

The Veterans were also asked to share their opinions about the program by filling out questionnaires after completing the workshop:

- 68 percent said they better understood how PTSD could relate to problems in civilian life after deployment;
- 40 percent said they experienced an increase in achieving their individual goals;
- 72 percent said they experienced an increase in feeling supported by other Vets;
- 31 percent said they experienced an increase in feeling connected to the VA; and
- 96 percent said they would recommend STEP-Home to other Vets.

The researchers concluded that STEP-Home is an acceptable treatment program for returning Veterans who suffer emotional difficulties as they try to reintegrate into their home communities. Veterans found the program tolerable and showed excellent compliance with program activities. Drop-out rates were less than half for those undergoing standard treatment for PTSD in OEF/OIF/OND Veterans.

Lead researcher Dr. Catherine B. Fortier is associate clinical director for the VA Rehabilitation Research & Development, National Center for TBI Research, and an assistant professor of psychology at Harvard Medical School. She has spent her research career at VA studying the effects of conditions like PTSD and TBI on returning Veterans, and the problems they experience as a consequence.

“Most important,” says Fortier, “Veterans who completed STEP-Home reported greater openness to other VA services, and outcome data supported
this with greater treatment and community engagement after completing STEP-Home. We believe that STEP-Home may function as a gateway for Veterans who are hesitant to participate in traditional but critically needed mental health treatments at the VA.”

Fortier recently presented the findings from her pilot study at the American College of Rehabilitation Medicine (ACRM) and the IBIA Eleventh World Congress on Brain Injury, and is preparing the findings for publication.

Veterans with PTSD like using online technology to manage care — VA researchers report that Veterans with posttraumatic stress disorder (PTSD) that occurs along with other illnesses welcome the use of eHealth tools to help manage their health. The study was published in the October 2016 issue of the Journal of Medical Internet Research.

Dr. Julia M. Whealin is a research health scientist at the National Center for PTSD Pacific Islands Division, in Honolulu. She and her team wanted to find out how Veterans with PTSD and co-occurring health conditions were using health care technology. They mailed surveys to a random sample of
1,500 patients who received care at a VA facility and were registered users of the VA’s online personal health record. Of those recruited, 479 Veterans responded to the survey and 119 reported having PTSD with at least one other health condition.

The results revealed that 44.6 percent of Veterans said they used health-related technology one to three times a month, for example, using the computer to look up health information or ordering medical supplies online. Another 21.4 percent of those surveyed said they used technology less than once a month. The researchers found 79 percent of Veterans used technology most often to look up questions about their health online, 71 percent used it to talk to their doctors, and 65 percent used it to keep track of medicines.

After they collected and analyzed the survey results, the researchers held two in-person focus groups to talk to Veterans and ask them how they used technology to manage their health. Five themes appeared: receiving support to cope with symptoms or a crisis, using online tools to manage symptoms, talking to doctors in a timely manner, finding accurate health information, and coordinating care between different doctors.

PTSD that occurs alongside other chronic illnesses is very common in returning Veterans and can complicate treatment. Many researchers, such as Whealin’s group, believe that helping Veterans “self-manage” some of their own health care can be an important part of the solution.
Quality of life for post-9/11 Veterans with PTSD
In the News

Probing probiotics as potential PTSD, TBI treatment

Military Times covered work underway at the VA Rocky Mountain Mental Illness Research and Education Clinical Center to learn whether restoring friendly bacteria in the gut might counter symptoms of PTSD and traumatic brain injury. (02/01/2017)

How aggressively should blood pressure be treated?

CNN covered a study by a Portland (Oregon) VA team that looked at the benefits and harms of intensive blood pressure treatment in older adults. The researchers analyzed data from 24 past studies. (01/18/2017)

Frailty screening boosts surgery outcomes

The Pittsburgh Post-Gazette covered a study by a VA Pittsburgh team that found that screening older patients for frailty before their surgeries significantly increased post-surgery survival rates. The study was published in JAMA Surgery. (01/06/2017)

Study tracks melanoma rates

The Associated Press reported on a VA study in JAMA Dermatology that tracked trends in melanoma — the most serious skin cancer — region by region in the U.S. between 2003 and 2013. New England was the only region to show an overall drop in both death and incidence rates. The authors believe strong public-awareness programs in the area may have driven the trend. (12/29/2016)
VA researcher cited in NYT piece on weed killer

Dr. Samuel Goldman, a researcher with the Parkinson’s Disease Research, Education and Clinical Center at the San Francisco VA Health Care System, was quoted in a Dec. 21, 2016, New York Times article on possible links between Parkinson’s disease and the herbicide paraquat, which is used widely in the United States. Goldman said there is “overwhelming data” tying the weed killer to the disease. (12/22/2016)

PTSD exposure therapy via videoconference

Fox News and other media outlets ran a Reuters piece on a VA study involving 132 Veterans with PTSD. The study was led by a team at the Ralph H. Johnson VA Medical Center in Charleston, South Carolina. It found that prolonged exposure therapy – one of the two main evidence-based psychotherapies VA recommends for PTSD – could be delivered just as effectively by videoconferencing as in person. This could enable Veterans to benefit from the treatment at home without having to travel to a VA site. (12/14/2016)
Honorable Mentions

January 18, 2017

VA researchers honored with Presidential Award for Early Career Scientists

Shortly before the end of his term, President Obama honored three VA researchers with The Presidential Early Career Award for Scientists and Engineers (PECASE). The award is considered to be the highest honor given by the United States government for investigators in the beginning of their research careers. This year, 102 scientists and researchers from 13 federal departments and agencies were named recipients of the award.

“I congratulate these outstanding scientists and engineers on their impactful work,” President Obama said in a Jan. 9, 2017, White House statement. “These innovators are working to help keep the United States on the cutting edge, showing that federal investments in science lead to advancements that expand our knowledge of the world around us and contribute to our economy.”

Awardees are selected for their pursuit of innovative research at the frontiers of science and technology. The VA awardees are Dr. Adam Rose, who was with the Edith Nourse Rogers Memorial Veterans Hospital in Bedford, Massachusetts, at the time of the award, and is now with RAND; Dr. Nasia Safdar, William S. Middleton Memorial Veterans Hospital in Madison, Wisconsin; and Dr. Joshua F. Yarrow, North Florida/South Georgia VA Health Care System.

Rose was recognized for his work on improving outpatient oral anticoagulation therapy. His studies have addressed how providers manage their patients on warfarin, a blood thinner used widely to help prevent heart attacks and strokes. Rose’s group developed a new composite measure that helps providers track the potential risks of the therapy more effectively than with existing measures, thus improving patient care. The new tool, known as the warfarin composite measure, also helps in comparing the performance of different facilities—for example, across the VA system—in terms of how well they manage their warfarin patients.
Honorable Mentions

Safdar was cited for achievements in the prevention and management of hospital-acquired infections (HAIs), along with related implementation research that bridges gaps between research and clinical practice. Her work examines work-system barriers to infection control in the hospital and identifies best practices to reduce the overall incidence of HAIs. In one ongoing study, her group is looking at the impact of a specific probiotic to reduce staph infections.

Yarrow received the honor for cutting-edge research regarding the musculoskeletal changes that occur after central nervous system injury. His work focuses on developing safe, effective, cost-efficient therapies to improve musculoskeletal and metabolic health in Veterans with spinal cord injury and other wasting conditions. In one current clinical trial, he is examining the benefits and risks of treating men with spinal cord injury who are low in testosterone with testosterone plus the drug finasteride, which is used to treat enlarged prostate, a possible side effect of testosterone replacement therapy.

December 2, 2016

VA research career scientist named 2016 AAAS fellow

VA researcher Shyam S. Mohapatra, Ph.D., MBA, has been named a 2016 fellow of the American Association for the Advancement of Science (AAAS) for outstanding contributions in the field of pharmaceutical and health sciences.

He was noted, in particular, for pioneering achievements in advancing biomedical nanotechnology (the use and application of very small particles that are measured in billionths of a meter) for inflammatory diseases.

Mohapatra is a research career scientist at the James A. Haley Veterans’ Hospital in Tampa, Florida. He is also a distinguished health professor at...
the University of South Florida, where he is director of translational medicine, associate dean of graduate programs in the College of Pharmacy, and a distinguished professor in the Institute for Advanced Discovery & Innovation. His research on the immunobiology of respiratory syncytial virus (RSV) and nanoparticle-mediated drug delivery and gene therapy, to name a few applications, has helped guide the fields of inflammation, immunology, infectious disease, biotherapeutics, and translational medicine.

RSV is a common viral illness that can present with a range of symptoms from mild to severe; almost all children are infected by 4 years of age. However, it can be troublesome for infants under 6 months of age, the elderly, and those individuals with weakened immune systems or congenital heart failure. It is a lower respiratory tract disease that, in its most severe form, can cause significant respiratory distress and pneumonia, and even death.

There is no cure or vaccine that is effective against the disease. However, Mohapatra’s research has led to greater understanding of the molecular mechanisms underlying RSV infection, and is thus paving the way for the development of a potential multigene vaccine and a new peptide-based treatment approach. He has also pioneered novel approaches for the potential treatment of allergies, asthma, traumatic brain injury, and cancers.

Mohapatra is also a fellow of the American Institute of Medical and Biological Engineers; the American Academy of Allergy, Asthma and Clinical Immunology; and the National Academy of Inventors. In addition, he is also among the inaugural inductees of the Florida Inventors Hall of Fame.

The AAAS is the world’s largest general scientific society, and publisher of the journal Science. Each year the association nominates a group of select members to become fellows. This year, the AAAS Council elected 391 members as fellows, in recognition of their contributions to innovation, education, and scientific leadership.

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**November 21, 2016**

**Dr. Michael Charness honored for contributions to understanding alcohol’s impact**

Michael E. Charness, M.D., professor of neurology at Boston University School of Medicine and associate dean of Veterans Affairs, was recently awarded the
2016 Mark Keller Honorary Award from the National Institute on Alcohol Abuse and Alcoholism (NIAAA).

Charness, who is also chief of staff at the VA Boston Healthcare System and professor of neurology and faculty associate dean at Harvard Medical School, was honored as an outstanding alcohol researcher who has made significant and long-term contributions to understanding alcohol’s effects on the body and mind.

Charness joined VA as a staff neurologist in 1989 and served as chief of neurology at the Brockton-West-Roxbury VA and the VA Boston Healthcare System from 1996 until 2003, when he became chief of staff. He serves on the Chief of Staff Advisory Committee to the VA principal deputy undersecretary for health and is VA’s representative on the Chief Medical Officer Group Steering Committee of the Association of American Medical Colleges.

Charness served as a member of the National Advisory Council of the NIAAA at the National Institutes of Health (NIH) and served as president of the Research Society on Alcoholism (RSA). He was awarded the Frank Seixas Award of RSA, a MERIT Award from NIAAA, the Excellence Award from the National Organization on Fetal Alcohol Syndrome, and the Henry Rosett Award from the Fetal Alcohol Spectrum Disorders Study Group of RSA.

His laboratory, with support from NIH and VA, studies the mechanisms of alcohol toxicity in the nervous system and the development of drugs that block alcohol toxicity.

He is scientific director of the NIAAA-funded Collaborative Initiative on Fetal Alcohol Spectrum Disorders and chairs the external advisory board for the NIH-funded Adolescent Brain and Cognitive Development study. He has cared for patients with neurological disorders throughout his career.

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November 10, 2016

**VA researchers honored for work on psychiatric disorders**

Four VA researchers received 2016 Outstanding Achievement Prizes for their work in neuroscience and psychiatric research from the Brain & Behavior Research Foundation. A panel of leading experts in brain and behavior research selected the winners. The award ceremony took place at the foundation’s 29th Annual National Awards Dinner in October.

Continued on next page
Honorable Mentions

The Lieber Prize for Outstanding Achievement in Schizophrenia Research

Michael F. Green, Ph.D., Professor, Semel Institute for Neuroscience and Human Behavior at UCLA; Director VA Research Enhancement Award Program (REAP) on Enhancing Community Integration for Homeless Veterans; and Director Treatment Unit, VA VISN 22 Mental Illness Research, Education and Clinical Center (MIRECC).

Dr. Green’s clinical research laboratory explores the relationship between cognitive and social cognitive impairments in schizophrenia and activities of daily living. His team also explores the neural mechanisms of cognitive and social cognitive dysfunction in schizophrenia and bipolar disorder. Green is a leading researcher in the evaluation of social cognitive retraining and novel pharmacological interventions to improve cognitive impairments. His laboratory also studies the determinants of community integration for homeless Veterans, many of whom have psychotic disorders. His identification of the importance of cognition in schizophrenia launched the national Measurement and Treatment Research to Improve Cognition in Schizophrenia (MATRICS) effort, and stimulated novel and innovative treatments for cognitive dysfunction.

Stephen R. Marder, M.D., Daniel X. Freedman Professor of Psychiatry, Vice Chair for Education in Psychiatry and Director, Section on Psychosis, Semel Institute for Neuroscience and Human Behavior at UCLA; Director VA Desert Pacific MIRECC; NARSAD Distinguished Investigator 2011.

During his career, Dr. Marder has focused on pharmacological and non-pharmacological approaches to improving the outcomes of serious mental illnesses, particularly schizophrenia. His clinical intervention research began with studies that evaluated strategies for reducing adverse side effects of antipsychotic medications and studies that evaluated the interactions of psychosocial interventions and pharmacological approaches to improving the outcome of serious mental illnesses. Together with Green, his fellow Lieber Prize recipient, he led the NIMH-MATRICS initiative, which addressed key issues in the development of medications for improving cognition in schizophrenia.

Continued on next page
The Maltz Prize for Innovative & Promising Schizophrenia Research

William P. Horan, Ph.D., Research Psychologist, Department of Psychiatry and Biobehavioral Sciences University of California, Los Angeles; Clinical Research Psychologist, VA Greater Los Angeles Healthcare System; Faculty VISN 22 MIRECC; NARSAD Young Investigator 2008 and 2004.

Dr. Horan conducts translational research to identify factors that contribute to difficulties in community integration among people with schizophrenia and other forms of psychosis, and has been a leader in the development of innovative treatments that may help patients improve the quality of their lives. More recently, he has begun applying this translational research approach to investigations of bipolar disorder and homelessness. In addition, he has focused on the development and validation of the Social Cognitive Skills Training Program for people with psychosis. The goal of this research is to develop new treatments that enable people with psychosis to live independently, pursue personally meaningful vocational and educational goals, and develop more satisfying social networks in the community. His work has led to a deeper understanding of the impairments in motivation and social behaviors that affect the lives of many people with schizophrenia, previously viewed by most clinicians as untreatable, and led to a new sense of optimism that these problems can be addressed in the clinic.

Amanda McCleery, Ph.D., Assistant Research Psychologist, Semel Institute for Neuroscience and Human Behavior at UCLA, VA Greater Los Angeles Healthcare System VISN 22 MIRECC; NARSAD Young Investigator 2015.

Dr. McCleery’s research focuses on cognitive predictors of functional outcome in schizophrenia and related conditions. Her recent work uses electroencephalogram (EEG) techniques in conjunction with performance-based measures to better understand the nature of the relationships between early-stage information processing, higher-order cognition, and community functioning across phases of illness in schizophrenia. Her work is also informed by developmental psychopathology in order to gain a nuanced understanding of the trajectory of cognition over the course of illness to identify potential critical periods and targets for intervention, as well as possible mechanisms of change.
Honorable Mentions

October 20, 2016

VA’s Middleton Award to researchers studying bone diseases, cancer

The VA Office of Research and Development (ORD) has presented its 2016 Middleton Award to two researchers: Stavros C. Manolagas, M.D., Ph.D., of the Central Arkansas Veterans Healthcare System, who studies osteoporosis and other metabolic bone diseases, and Ann Richmond, Ph.D., of the VA Tennessee Valley Healthcare System, who studies cancer.

The Middleton Award is the highest honor from VA Biomedical Laboratory Research and Development, part of ORD. The annual award, established in 1960, honors senior VA research scientists for outstanding scientific contributions and achievements in biomedical and behavioral research relevant to Veterans’ health care.

Pioneering work on osteoporosis

Manolagas’ award recognizes his exemplary record of service to VA and the biomedical profession and his pioneering work on the mechanisms underlying osteoporosis and other metabolic bone diseases. He is credited with advances in skeletal biology that have changed clinical care. His discoveries, for example, resulted in improved management of chronic kidney disease through the administration of vitamin D. The treatment eases hyperparathyroidism—an excess of parathyroid hormone in the blood, due to overactive parathyroid glands, that can result from kidney disease.

His other trademark contributions include explaining the role of sex steroid hormones, including estrogen, in bone biology and osteoporosis in both men and women, and developing a treatment for postmenopausal osteoporosis and painful metastatic bone diseases.

Manolagas has spent nearly four decades studying bone and mineral metabolism and related topics. He is chief of the endocrinology section of the Central Arkansas VA and director of the division of endocrinology and metabolism at the University of Arkansas for Medical Sciences. Among other roles at the school, he is also the founder and director of the Center for Osteoporosis and Metabolic Bone Diseases.

Continued on next page
Honorable Mentions

**Advancing skin cancer treatment**

Richmond is a senior associate career scientist with VA in Nashville and a professor at Vanderbilt University School of Medicine. A cancer researcher, she was honored for significant contributions to understanding “chemokines,” inflammatory proteins that can regulate tumor growth. Her research has helped lay the foundation for understanding how to improve immunotherapies against melanoma, a potentially lethal skin cancer that affects Gulf War Veterans disproportionately.

Richmond says Gulf War Veterans are at higher risk of developing melanoma, and dying from the disease, compared to the general population because of the heavy sun exposure they incurred during their deployments.

“A lot of our work is linking how chemokines, as inflammatory mediators, play a role in the recruitment of anti-tumor leukocytes [white blood cells] into the tumor microenvironment to help boost the immune response to the tumor, and allow these immune cells to destroy tumor cells,” Richmond says. “Immunotherapy is the best treatment we have now for metastatic melanoma. We’ve made huge strides in understanding how to treat this disease.”

Richmond has been a Vanderbilt faculty member since 1989, and a VA researcher since 1983.

The VA award is named for the late William S. Middleton, M.D., who served as VA’s chief medical director from 1955 to 1963. He was instrumental in initiating and expanding VA research. Each awardee receives $50,000 per year for three years in research support from VA and a cash award of $5,000. VA also provides a plaque for the awardee and his or her medical center.