

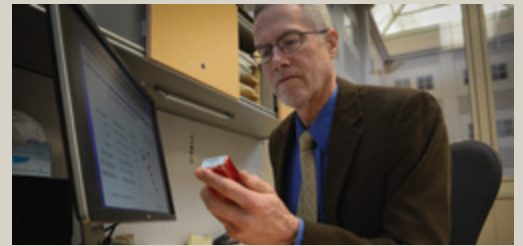
# VA

## RESEARCH CURRENTS

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

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Photo by Mitch Mirkin



**Which limb to prescribe?**  
Gait lab aims to build evidence base



## For mental health patients who smoke, more intensive phone support may boost quit rates

A study at six VA sites found that specialized counseling delivered by telephone may be more effective than state “quit-lines” to help smokers in mental health care kick the habit.

The study intervention yielded a quit rate of 26 percent at six months, versus 18 percent for the state quit-lines. The randomized trial included 522 Veterans, 270 of whom received the special intervention and 307 of whom were referred to their local quit-lines.

The cessation rates were based on patients’ self-reports, so they may not be fully accurate, point out the researchers. But the results seem to validate the tailored approach.

The study findings appear in the April 2016 issue of the *American Journal of Preventive Medicine*.

### State quit-lines offer mix of services

Smoking rates among those with mental health diagnoses are around 25 to 36 percent, compared with 16 to 21 percent among those without any such diagnosis.

Every state in the U.S. has a telephone quit-line that offers a mix of services, such as telephone behavioral counseling, supportive text messages, referrals to local support groups or online communities, and free or low-cost nicotine replacement therapy.


Research has found the services to be fairly effective. But studies have also suggested they may be somewhat less effective for those with mental health conditions such as depression, anxiety, PTSD, or schizophrenia.

The approach used in the VA study was custom-designed for patients receiving care in mental health clinics. The phone counseling incorporated motivational interviewing, problem-solving therapy, and cognitive behavioral therapy. Study counselors kept patients’ VA mental health providers abreast of the telephone sessions, via entries in the electronic medical record. They also encouraged patients to


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U.S. Department of Veterans Affairs  
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Office of Research and Development

talk about quitting with their psychologists or other mental health providers.

The counselors who delivered the protocol underwent four hours of training in motivational interviewing and 20 hours of additional training—including role plays.

They engaged in up to 10 calls with patients, including pre-quit and post-quit sessions, each lasting from about 30 to 60 minutes.

### Veterans randomized to state quit-line or intervention

Veterans who volunteered for the study were randomized to either a state quit-line or the study intervention. The quit-lines servicing the study participants varied in how many proactive counseling sessions they provided to callers, ranging from one to six.

Regardless of which study arm patients were randomly assigned to, the mental health providers who referred them were expected to provide initial prescriptions for nicotine replacement therapy or another cessation medication.

After six months, participants in the study intervention were more likely to report having used telephone counseling (67 vs. 42 percent) and nicotine replacement therapy (76 vs. 71 percent)—both mainstays of cessation treatment.

The researchers write: “The effectiveness of the specialized intervention can be partially explained

by the higher proportion of specialized counseling arm participants using telephone counseling and [nicotine replacement therapy]. Prior research has found that smokers with a mental health condition are more likely to quit if they receive both behavioral support and pharmacotherapy (and either alone may be ineffective).”

Although Veterans who received the special counseling reported higher satisfaction with their treatment, compared with those who used the state quit-lines, the quit-lines got high marks in their own right. The study authors note that “the majority of quit-line participants who engaged in counseling reported high satisfaction in counselor listening skills and nonjudgmental approach, usefulness of counseling, and convenience of counseling. This suggests that the approaches currently used by quit-lines are resulting in excellent service and patient experience.”

The researchers note that since more than 90 percent of the study participants were men, future research on the model should include more women—as well as non-Veterans. But mean-

while, they suggest that state quit-lines may want to look at incorporating some elements of the special counseling approach used in the study for their work with callers who have mental health conditions. ★



“Every state in the U.S. has a telephone quit-line that offers a mix of services.

Photo: ©iStock/pavlemarjanovic





VA researchers and colleagues analyzed data from long-term studies of aging in nuns and Japanese American men.

## Beyond Alzheimer's: Study reveals how mix of brain ailments drives dementia

A new analysis based on two long-term aging studies—one of Roman Catholic nuns, the other of Japanese American men—provides what may be the most compelling evidence yet that dementia commonly results from a blend of brain ailments, rather than from a single condition. This is often the case even when an Alzheimer's diagnosis has been given, say the researchers.

A team led by Dr. Lon White, with the University of Hawaii and the VA-affiliated Pacific Health Research and Education Institute, analyzed data on more than 1,100 people who had taken part in the Nun Study or the Honolulu-Asia Aging Study. Both studies followed hundreds of aging adults and included brain autopsies upon their death.

The analysis by White's team is in the March 15, 2016, issue of *Neurology*.

"The impact on clinical dementia and impairment is largely unrelated to the type of lesion, or type of lesion combination," said White in an email interview. "Rather, the driving factor seems to be just the total burden of disease."

Read more at [www.research.va.gov/currents](http://www.research.va.gov/currents)

## High opioid doses could be marker for suicide risk

In a VA study of nearly 124,000 Veterans, those receiving the highest doses of opioid painkillers were more than twice as likely to die by suicide, compared with those receiving the lowest doses. But it's unclear from the study whether there's a direct causal link between the pain medications and suicide risk. Rather, the high doses may be a marker for other factors that drive suicide—including unresolved severe chronic pain.

The findings appeared online Jan. 5, 2016, in the journal *Pain*.

"This relationship is likely more complicated than an increase in access to opioids leading to an increase in intentional overdoses," wrote the authors, led by Dr. Mark Ilgen.

Ilgen, based in Ann Arbor, Mich., is with the VA Serious Mental Illness Treatment Resource and Evaluation Center, and the VA Center for Clinical Management Research. He is also on the psychiatry faculty at the University of Michigan.

The study analyzed data on 123,946 Veterans who received VA care in 2004 and 2005. All of them had non-cancer chronic pain and received prescriptions for opioids. Using the National Death Index, the



Chronic pain by itself is a risk factor for suicide. Researchers are trying to tease out how treatment with opioids may affect the risk.

researchers identified 2,601 of these patients who died by suicide before the end of 2009. Then they compared prescribed daily doses of opioids between the suicide group and the overall group. They also looked at the types of prescriptions the Veterans had received: regularly scheduled doses, only as needed, or a combination.

The researchers controlled for an array of demographic and clinical factors, to tease out the dose-suicide relationships. They used a standard formula to calculate morphine equivalencies for the different opioid drugs that patients may have received.

The main finding was that suicide risk rose as dose increased. Compared with patients taking 20 milligrams a day or less, those in the highest dose category—100 or more milligrams per day—were more than twice as likely to die by suicide.

[Read more at www.research.va.gov/currents](http://www.research.va.gov/currents)

### Study offers snapshot of colonoscopy quality in VA versus private sector

A study at one VA medical center found that the detection rate for potentially precancerous polyps—a key measure of colonoscopy quality—was substantially higher among patients whose procedures were done in VA than among similar VA patients who were referred out for colonoscopy to private facilities.

The study, performed at the White River Junction VA Medical Center in Vermont, may not be representative of all VA medical centers.

“I don’t want to negate our results, but it’s difficult to generalize

our findings,” said Dr. Heiko Pohl, the study’s senior author. Pohl is a researcher and gastroenterologist at the White River Junction VAMC and the VA Outcomes Group, and an associate professor at Dartmouth’s Geisel School of Medicine and the Dartmouth Institute.

The study appeared online in *Gastrointestinal Endoscopy* on Jan. 16, 2015. Pohl’s coauthors were Drs. Douglas Robertson, also with the White River Junction VA; and Michael Bartel, of the Mayo Clinic.

### Study compares ‘adenoma detection rates’

The main outcome measure of the study was what gastroenterologists call the “adenoma detection rate,” or ADR. An adenoma is a type of polyp, or growth, that occurs on the lining of the colon. Adenomas can harbor cancer, or turn cancerous. Doctors snip them out during a colonoscopy and send them to the lab to be biopsied.

Colorectal cancer is the third most common cancer in the U.S. It is also the second leading cause of cancer deaths, behind lung cancer. VA diagnoses some 4,000 new cases of the disease each year in Veterans.

The Vermont study involved 818 patients in all, almost all men, between ages 50 and 85. Half underwent a colonoscopy at the White River Junction VAMC. The other half had their procedures at an outside facility.

The White River Junction VA, like other VA medical centers, has contracts in place that allow it to refer patients to outside providers for certain services, at VA’s expense. This was the case even before the passage of the 2014 Veterans Choice Act.

Nationally, about a third of VA patients who undergo colonoscopies

	25	26
	1	2

Colonoscopy  
8 am @ VA

A study at the White River Junction VAMC in Vermont compared colonoscopies performed at that facility to those done at outside facilities to which VA patients were referred.

have them at outside facilities.

Pohl's study included patients who had procedures between 2007 and 2010. He says during this time, only about 10 percent of the colonoscopies done for White River Junction VA patients were performed at outside facilities.

He says the White River Junction VA generally tries to handle all colonoscopies in-house, but during times of peak demand, the facility will give Veterans an option to go to an outside provider.

The study found that the ADR for patients referred to outside providers during the study period was 38 percent. In other words, the procedures detected at least one adenoma, or polyp, in 38 percent of the 409 patients referred to the outside facilities, which included 30 nonacademic centers and 2 academic, or teaching, hospitals.

In comparison, the ADR among those patients who had a colonoscopy at the VA hospital was 52 percent. The patients were matched on age, gender, and year of procedure to the group that had the test done outside.

Both figures represent good care, stresses Pohl.

“On the whole, our findings suggest there's good quality inside and outside,” he says. “No matter where patients got their colonoscopy, the quality benchmarks were reached.”

Read more at

[www.research.va.gov/currents](http://www.research.va.gov/currents)

## Study: VA doing good job at managing migraines

A study that included more than 57,000 VA patients diagnosed with migraine headaches found that 4 in 10 are getting prescriptions for triptans—the top recommended treatment. The study also found that about half are getting preventive treatment in the form of antidepressants or other drugs shown to ward off the debilitating headaches.



Photo for illustrative purposes only.  
©iStock/Anne Clark

Migraines affect up to around 17 percent of men and 33 percent of women in the U.S. in a given year.

And a relatively small number—fewer than 1 in 20—are receiving opioids for migraine pain, which is not a recommended treatment.

Overall, the findings paint a good picture of VA care for migraines, says lead author Dr. Hamada Hamid Altalib, a neurologist with VA and assistant professor at Yale School of Medicine.

“Compared to civilian population studies, VA is doing a very good job in terms of giving people migraine-specific medications, and not giving opioids or narcotics for their pain,” he says.

Besides treating patients, Altalib co-directs the Epilepsy Center of Excellence and is a health-services researcher at the Pain Research, Informatics, Multimorbidities, and Education (PRIME) Center at the VA Connecticut Health Care System.

His team included colleagues from Yale and the University of Massachusetts. They published their findings in the journal *Cephalalgia* on Feb. 25, 2016.

Read more at [www.research.va.gov/currents](http://www.research.va.gov/currents)

## Study questions effectiveness of commonly used medication for back pain

A study at the VA San Diego Healthcare System suggests the pain medication gabapentin is no more effective than placebo at treating chronic low back pain.

The findings appeared online March 8, 2016, in the journal *Pain*.

Chronic low back pain is a common disabling condition, and doctors have found few effective treatments.

Gabapentin, sold as Neurontin and a couple of other brands, is used mainly to treat seizures. It is also recommended by many clinical practice guidelines as a first-line treatment for neuropathic pain. Partly for that reason, it is often prescribed for low back pain. There's also some evidence of its efficacy for pain relief in fibromyalgia. However, few controlled trials have tested the drug for low back pain.

With VA funding, researchers with VA and the University of California, San Diego, conducted a trial to explore the question. They randomly assigned 108 patients with chronic back pain to either gabapentin or sugar-pill placebo. Both treatments were packaged in identical gelatin capsules.

Patients took gabapentin or sugar pills in the same amounts and frequency during the 12-week study. The two groups completed questionnaires about pain intensity, mood, and quality of life throughout the trial. Both patients and the study physician were blinded as to which group each participant was assigned.

### Gabapentin no more effective than placebo

After 12 weeks, a majority of study participants reported at least a 30 to 50 percent decrease in pain intensity from the start of the study. However, the difference between pain reduction in the gabapentin and placebo groups was not significant. The study also did not detect differences between the groups for disability scores.

Read more at [www.research.va.gov/currents](http://www.research.va.gov/currents)



In a VA San Diego study, patients with back pain took gabapentin or identical-looking sugar pills for 12 weeks.



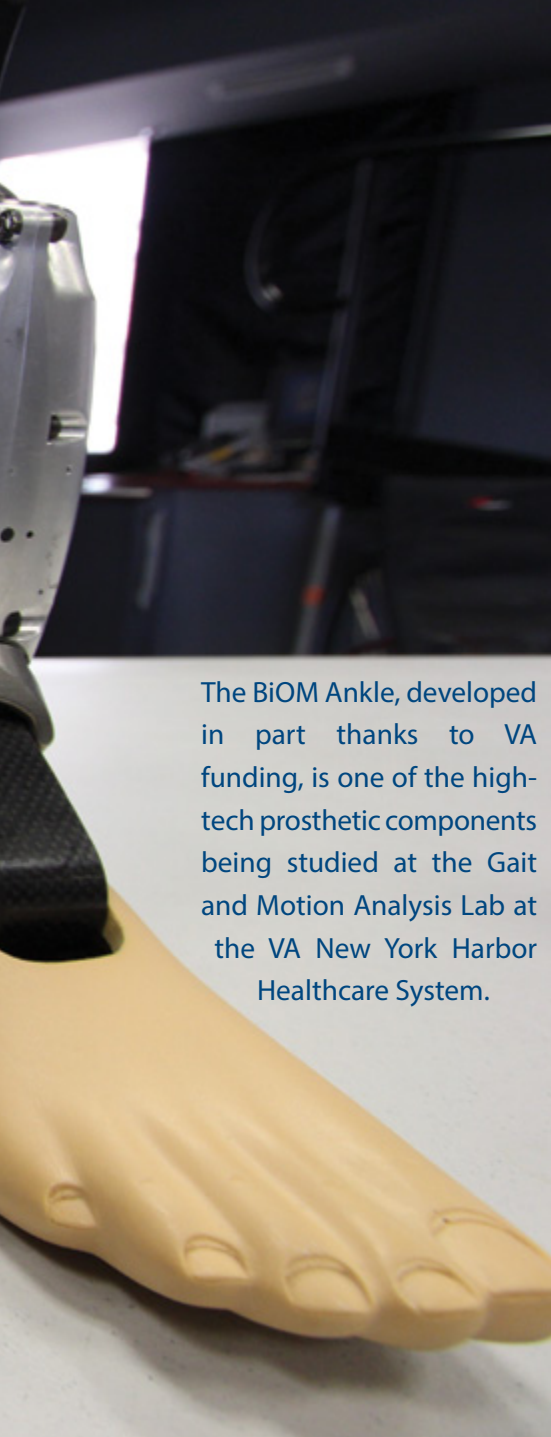


Photo by Mitch Mirkin

## Which bionic limb to prescribe? **Gait lab aims to build evidence base**

Today there are more than 100 different models of prosthetic feet available, ranging from the relatively simple to the sophisticated, and several models of computerized knees. How do clinicians know which components are best for a Veteran? VA researchers in New York aim to make the prescribing process more scientific.





The BiOM Ankle, developed in part thanks to VA funding, is one of the high-tech prosthetic components being studied at the Gait and Motion Analysis Lab at the VA New York Harbor Healthcare System.

**D**r. Jason Maikos' lab looks down on busy E. 23rd St. in New York City, a block from the East River. Across the street is a sprawling complex of tall red-brick apartment buildings named after Peter Stuyvesant, who oversaw the Dutch settlement on Manhattan starting in 1645. A year earlier, Stuyvesant had lost his right leg to a cannonball in a battle to take a Spanish-held Caribbean island. His leg was replaced by a wooden peg, which he adorned with silver nails.

Prosthetics has come a long way—witness the \$35,000 computerized knee that sits on a table in Maikos' Gait and Motion Analysis Lab, coupled with a \$30,000 bionic foot.

The high-tech components are awaiting testing with Veteran amputees who come to the lab. Some have lost a leg to an IED or rocket-propelled grenade in Iraq or Afghanistan—or perhaps to a mine or mortar blast decades ago in Vietnam. Others have lost a foot or leg in an accident, or to diabetes or vascular disease.

The purpose of the tests is twofold: to help determine the best prescription for the Veterans, and to gather research data. Along with gait abnormalities, Maikos studies functional outcomes such as walking speed and distance.

Maikos, a biomedical engineer, wants to help shift prosthetics prescribing to a more objective, scientific process. Right now, the process relies heavily on anecdotal knowledge and the clinical instincts and judgement of prosthetists, physiatrists, and physical therapists. Their assessment can sometimes be based mainly on watching how the patient walks.

“In a visual gait analysis, any two clinicians will agree on approximately 60 percent of the anomalies they see,” says Maikos. “In our lab, the 40 percent variation is taken out of the equation. We work with objective measurements.”

### Building a diverse research portfolio

His lab was set up in 2010 to offer state-of-the-art clinical evaluations for patients across the VA region—facilities spanning the five boroughs of New York, Long Island, the Hudson Valley, and northern New Jersey. Since that time, Maikos has also worked to build a diverse research portfolio, with funding from VA, foundations, industry, and other sources.

The equipment in the lab allows him to discern movement abnormalities on a much smaller

**“We don’t care if you’re younger or older. If this knee is going to benefit you, our team can prescribe it.”**

scale than is possible with naked-eye observations. But mainly, says Maikos, “it’s more objective than a subjective visual analysis.”

There are several such gait labs throughout the VA system. Unlike biomedical labs, typically crammed into narrow rooms where every inch of counter and shelf space is taken up with glassware, centrifuges, hot plates, and other equipment, a gait lab is more open and spacious. There has to be room for patients to walk—that’s the whole idea.

Whether the issue is limb loss, partial paralysis, or any other mobility impairment, the patient or research participant will walk across the floor, up and down a movable three-step wooden staircase, and up and down a large ramp, set at varying slopes.

Maikos’ lab also has a treadmill, a bicycle mounted on a trainer stand, and a recumbent tricycle. And in one corner is a rectangular patch of green turf—a mini golf course, part of a larger adaptive golf program, where the team can study the biomechanics of a Veteran’s swing.

In the center of the lab, four rectangular force plates are embedded in the floor, sitting on a concrete bed. Two of them have glass tops, so a camera mounted underneath can record a patient’s

step from below. The plates measure the ground reaction forces as the foot hits the plate. There’s also a pressure-sensitive walkway that lets the researchers gauge pressure on different areas of the foot.

### **Motion-capture system is heart of lab**

Look overhead in the lab and you’ll see eight high-speed video cameras mounted on the ceiling around the large room, all pointed toward the center. Each camera has a ring of infrared LED lights. This is part of the motion-capture system—the centerpiece of any gait lab. Maikos explains how it works:

“We apply markers to the patient. These are spheres covered in reflective tape—the same tape you might have on your sneakers. We place the markers on strategic locations on the body—joint centers, bony landmarks. When the cameras are on, a strobe of infrared light hits the markers and gets reflected back into the camera’s detector. If any two cameras capture any one marker on the body, you can recreate its location in 3-D space. So we can start to look at joint motion and joint angles.”

A patient or research participant, taped up with markers, walks back and forth across the floor, or on a treadmill. Maikos sits nearby behind two ultra-wide curved monitors



Photo by Mitch Mirkin

Dr. Jason Maikos uses 3-D motion-capture software to analyze the biomechanics of Ed Sliwinski as he walks on a treadmill, spotted by Dr. Leif Nelson.

and uses motion-capture software to analyze the person's gait and build models of it. The patient appears as an animated 3-D figure on the screen, the movement of his joints and limbs translated into precise numerical values.

In Maikos' prosthetics studies, the technology allows a granular look at how a Veteran is adapting to a prosthetic foot or leg, and how the components are affecting his overall biomechanics.

In one pilot study, funded by the American Orthotics and Prosthetics Association, Maikos has been evaluating Veterans fitted with a microprocessor-controlled knee and a powered ankle-foot device. The ankle-foot, called the BiOM, was developed in part with VA funding, by a team led by Dr. Hugh Herr of the Massachusetts Institute of Technology.

"The big thing with the BiOM is the power," says

Maikos. "It provides that biologically normative ankle power."

### Evaluating Veterans fitted with 'world's most advanced leg'

The above-the-knee amputees taking part in the study also get to try out an advanced leg called the X3, which its manufacturer, Ottobock, calls "the world's most technologically advanced prosthetic leg."

Maikos explains what makes the leg special:

"In addition to the microprocessor, it has gyroscopes and accelerometers, so it knows which direction you're walking in, which is important. On the older C-Legs (an earlier, slightly less sophisticated computerized model), if you took a step backwards and landed on the toe with the knee extended, it would buckle and you could fall. So a





Dr. Jason Maikos, a biomedical engineer, directs the Gait and Motion Analysis Lab at the VA New York Harbor Healthcare System.

product like the X3 allows you to walk backwards, or in any direction you want, and the knee knows which way you're going.”

Maikos adds: “You can use the Walk2Run mode when there is a need to run, and it intuitively provides a large swing angle for running. It also has built-in stance phase flexion, which acts as a shock absorber so the force of your heel hitting the ground gets attenuated a bit as it translates through the other joints. That’s an important biomechanical feature.”

The X3 made of titanium, aluminum, and stainless steel, is also rugged and waterproof. “It’s completely submersible in water,” says Maikos, “which is a popular feature among our Veterans for water activities, and even showering.”

The model is also “nearly impenetrable by dust or dirt,” says the company, which designed it with

active-duty service members in mind.

### New componentry is for young and old alike

In the VA system, you might think only Veterans who are prime athletes would get such a leg, which costs around the same as a 2016 Chevy Camaro—in the neighborhood of \$30,000 to \$35,000. Not so.

“If there’s a medical justification, a Veteran will get it,” says Maikos. “There’s a push to continue an active, healthy lifestyle. We don’t care if you’re younger or older. If this knee is going to benefit you, our team can prescribe it.”

Of course, not every Veteran needs or wants the latest and greatest componentry.

“Some people prefer a simpler ‘set it and forget it’ system,” says Maikos.

He says there are more than 100 models of prosthetic feet on the market, from the \$30,000

BiOM, to standard carbon-fiber “energy storing and returning” models that cost around \$1,100.

Those simpler feet are based on a design pioneered by VA researcher Dr. Ernest Burgess in Seattle in the 1980s, in collaboration with Boeing Aerospace. It makes use of lightweight, springy materials.

“The foot stores energy during heel strike,” explains Maikos. “As you roll forward through stance phase, it returns some of that energy at push-off.”

One goal of Maikos’ research is to learn more about who does better with which types of components. “The studies we’re doing now are helping to determine some preliminary prescription criteria,” he says. “We want to develop guidelines.”

In future research, he wants to look not only at users’ physical characteristics, but also at the cognitive abilities necessary to learn various features and use them effectively. This is less of an issue with lower-limb prosthetics than with artificial hands and arms—which have far more functions and degrees

of freedom—but it’s still a factor, especially with products like the X3.

“We want to know which candidates are best to get these devices,” says Maikos. “We now have some data to seed future studies to explore these topics more in depth. Who will benefit most from a certain type of device, and who’s going to want to use it?”

Another question he hopes to study: Can lower-limb amputees benefit from a regimen of physical therapy that is specifically designed for their particular device?

On the whole, Maikos believes “the field of prosthetics can greatly benefit from this type of research. We can maximize the use of these advanced technologies.”

Peter Stuyvesant, immortalized in a statue—peg leg and all—in a nearby park that bears his name, would no doubt have been interested. ★

## PTSD pioneer Dr. Terence M. Keane receives 2015 Barnwell Award

Terence M. Keane, Ph.D., received the 2015 John Blair Barnwell Award from VA Clinical Science Research and Development for his work in the area of traumatic stress.

Keane helped lay the foundation for the understanding of PTSD as a serious mental health problem that can stem from both military and civilian traumas. He led efforts to create and validate measures of exposure to traumatic experience and PTSD symptoms. Some of those measures remain the gold standard in the field.

Read more at [www.research.va.gov/currents](http://www.research.va.gov/currents)



Photo by James Lally



Dr. Frank Lederle, a physician at the Minneapolis VA Health Care System and an investigator with VA's Center for Chronic Disease Outcomes Research, is chairing a VA "point of care" study comparing two diuretics.

## VA comparison of two 'water pills' will use new approach

A trial comparing two diuretic medications is one of the first examples in VA of "point of care" research. Experts say the innovative model is more cost-effective than conventional clinical trials, and the results easier to translate into everyday care.

VA is launching a clinical trial comparing two diuretics—medications that get rid of excess water in the body by increasing urine flow. The drugs, also known as "water pills," can help lower blood pressure in people with hypertension.

Nothing revolutionary there. In fact, each of the drugs has been around for decades.

What is new is the way the trial is being run.

The study is one of the first examples in VA of "point of

care" research. It's an innovative model that experts say is more cost-effective than conventional clinical trials. And the results, they say, are easier to translate into everyday care.

"We are using a new, efficient, less expensive study design," says study chair Dr. Frank Lederle, a physician at the Minneapolis VA Health Care System and an investigator with VA's Center for Chronic Disease Outcomes Research. "All patient care, including the study drug, will be

managed by the Veteran's regular primary care provider. It's a clinically integrated design."

Lederle is also a professor at the University of Minnesota School of Medicine.

Leading the study with him is Dr. William Cushman, a well-known hypertension expert with the Memphis VA Medical Center and the University of Tennessee Health Science Center.

The trial will get underway in Boston in March 2016 and then be rolled out to a handful



of other VA sites: Minneapolis, Memphis, Houston, Cleveland, and West Los Angeles. More sites may be added as the study progresses.

### No need for on-site research personnel

The key to the cost-savings, says Lederle, is that no special research personnel are required at any of the study sites.

“The most exciting part to a trialist is that there are no local research personnel,” he says. “The trial is run entirely from a central headquarters, which is why we expect such a dramatic reduction in cost.”

The two drugs being compared are both thiazides. These drugs act on the kidneys to remove more salt and water from the body through urination. This relaxes blood pressure walls and lowers blood pressure.

More than a million VA patients are prescribed such drugs each year. The great majority—more than 95 percent—get hydrochlorothiazide. Only about 2 or 3 percent get chlorthalidone, which costs about the same. But indirect evidence suggests the less commonly used drug—chlorthalidone—may actually do a better job of preventing stroke, heart attack, and other life-threatening cardiovascular events.

Lederle coauthored a 2014 editorial in the *American Journal of Kidney Disease* that reviewed the evidence and stressed “the urgent need for a comparative efficacy outcome trial” pitting the two diuretics head to head.

The new VA study will do just that. It aims to enroll 13,500 Veterans over three years. All the participants are age 65 or older, and all are currently taking hydrochlorothiazide.

About half the Veterans will be randomly assigned to continue taking hydrochlorothiazide.

The others will be switched to an equivalent dose of chlorthalidone. The study team will follow the Veterans for three years, on average, to track their cardiovascular and mortality outcomes.

### Study conducted within framework of routine care

Unlike most clinical trials, the entire protocol will be conducted within the framework of routine care. VA primary care providers will see an alert in the records of patients who meet the eligibility guidelines for the study. The provider can read about the study and decide whether to allow the research team to contact the patient. Patients who agree to take part and who complete informed-consent paperwork are then randomized to one drug or the other.

At this point, care returns to the regular provider. He or she will see orders for the assigned treatment in the electronic medical record, and prescribe accordingly.

“There’s very little disruption in the patient’s care,” notes Lederle.

The research team will use the electronic medical record and other databases to passively track clinical outcomes. They’ll also collect data on deviations from treatment protocols, and patient compliance with the assigned treatment. As far as patients are concerned, there are no research interviews, surveys, or study visits to deal with. Just routine care.

Lederle says the point-of-care design, still relatively new, is likely to become more common in clinical research over the next few years. “We expect it will not only lower costs significantly, but that the study results will be available much sooner to help guide clinical practice.” ★

**“The trial is run entirely from a central headquarters, which is why we expect such a dramatic reduction in cost.”**



Photo by Kevin Walsh

## Treating TBI and PTSD together: Psychotherapy plus ‘CogSMART’ being tested at San Diego VA

VA researchers in San Diego are testing a combination treatment that targets both PTSD and mild TBI. Weekly sessions weave in cognitive rehabilitation strategies with an evidence-based form of psychotherapy.

Mild traumatic brain injury and posttraumatic stress disorder—they are both known as “signature wounds” of the recent wars in Afghanistan and Iraq. In fact, among Veterans with mild TBI, at least 4 in 10 also have PTSD.

So addressing the two conditions together makes sense. That’s the premise behind an ongoing study at the VA San Diego Healthcare System. Researchers are combining an evidence-based PTSD treatment called cognitive processing therapy (CPT) with a relatively new approach to mTBI called Cognitive

Symptom Management and Rehabilitation Therapy, or CogSMART for short.

“We have integrated components of CogSMART into CPT in order to address the unique challenges faced by Veterans with ongoing cognitive complaints related to PTSD and a history of mild TBI,” wrote the team, led by Dr. Amy Jak. They described their approach in an article in the journal *Contemporary Clinical Trials* in November 2015.

The researchers call the combined therapy SMART-CPT.

◀ Dr. Amy Jak and research assistant Mark Sanderson-Cimino review the SMART-CPT protocols.

The study has been underway since 2012 and will wind down later this year. The goal is to have enrolled 90 Veterans in all.

CPT was first developed by VA psychologist Dr. Patricia Resick, with the National Center for PTSD, in the 1980s. Clients learn about their PTSD symptoms, and the changes in beliefs that often occur after trauma—for example, about safety, trust, and relationships. They are helped to become aware of their thoughts and feelings, and use worksheets that teach them how to challenge their unhelpful thoughts.

CPT and prolonged exposure therapy are the two main psychotherapies promoted in VA for treating PTSD.

### CogSMART pilot yielded hopeful results

CogSMART was first developed by Jak's colleague Dr. Elizabeth Twamley at the San Diego VA. Over 12 weeks, it teaches Veterans strategies to help with fatigue, sleep problems, headaches, and stress, and to improve attention, memory, and problem-solving.

In 2014, the CogSMART group published a pilot study involving 50 Veterans. The trial showed improvements in several areas, including memory.

Twamley compares CogSMART to using a cane to support a weak leg: “By working around impairments, we can take advantage of an individual’s strengths ... and use different ways and possibly different brain areas to perform cognitively demanding tasks.”

A regular weekly CPT session is an hour long. Weaving in the CogSMART components for the full SMART-CPT session adds 15 minutes.

Jak says her team takes into account the impact that PTSD and TBI combined can have on attention span.

“There are breaks built in, particularly in SMART-CPT. These are active, very purposeful breaks. Not ‘I’m worn out and I can’t do anymore.’ We try to do breaks before they get to that point.”

One of the key strategies Veterans learn in CogSMART, or the combined SMART-CPT therapy, is to use calendars. Like a lot of the strategies taught in the program, it doesn’t have any stigma attached. It’s something most organized people do routinely, whether they have special challenges or not.

“They’re the strategies successful people use every day,” says Twamley. “There’s no stigma associated with using your smartphone calendar to remember things. I use mine.”

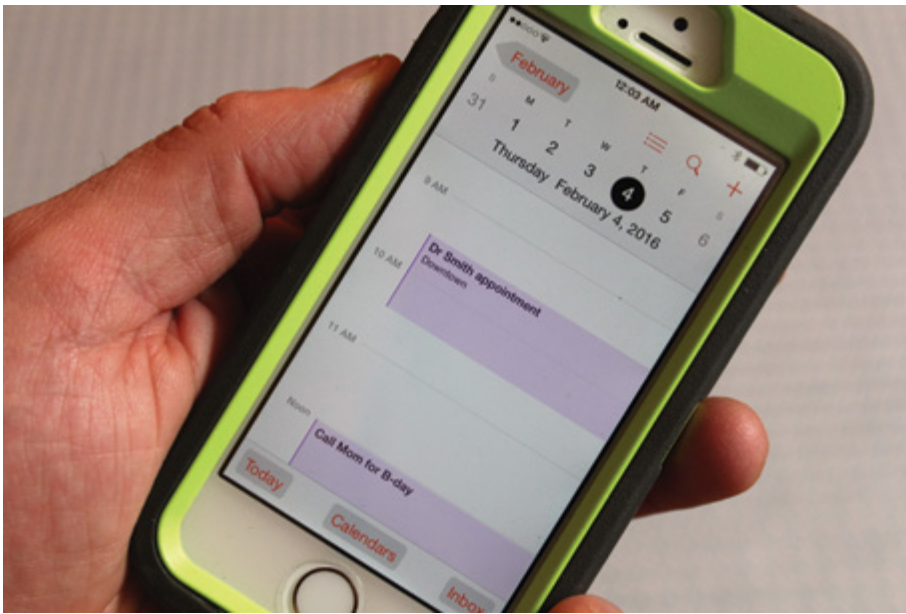
By the same token, the strategies are not necessarily specific to TBI.

“The strategies in and of themselves don’t care



“These are strategies that are often useful for perfectly healthy people. We all forget stuff.”





Taking better advantage of smartphone or paper calendars is one of the strategies taught in CogSMART and SMART-CPT.

where the memory or attention problems come from,” Jak points out. “If somebody came to me who had ADD, or multiple sclerosis, I would teach many of the same strategies.”

### Strategies back by evidence, clinical experience

Jak says that while not every CogSMART technique used in SMART-CPT has the same level of formal scientific evidence behind it, “CogSMART as a whole, and cognitive rehabilitation in general, have been shown efficacious in research. Practical experience in the clinic also supports the effectiveness of the specific cognitive strategies.”

She adds: “These are all compensatory strategies. In general, there’s empirical support for the idea of cognitive rehabilitation using these approaches—taking the weaknesses you have and then using your strengths to work around them. Many of the specific strategies are culled from years of clinical experience, from people who are doing rehab regularly.”

As for using a calendar, Jak says most Iraq and Afghanistan Veterans gravitate to the options on

their phone, rather than the old-fashioned paper kind.

“A lot go straight to the calendar that’s in their phone,” says Jak. “It’s a younger cohort and they’re technologically savvy.”

But there are exceptions. And it’s all about customizing the strategies based on what the person needs.

“Some people might pick a big whiteboard calendar to keep at home—maybe they have a spouse and children and they want to coordinate others’ activities,” says Jak. “Or, it’s just a bigger visual reminder, or the person is prone to losing his phone. What’s going

to fit best with their style?”

Whether participants go with digital or paper, says Jak, the main thing is helping them switch to some sort of reliable system to help them plan their time and keep track of their appointments and responsibilities.

“Our clinical, anecdotal experience is that often getting people just to use a calendar is the shift. It’s going from, ‘Hey, I can keep all this in my head,’ to, ‘Yes, I need to use an external device.’”

### Finding a ‘home’ for personal items

Another cognitive strategy taught in the program is finding a “home” within the house or apartment for personal items. If you’re ever misplaced your keys or phone, you can relate.

“It seems simple,” says Jak, “but when people aren’t doing it and then change to making this a part of their routine, it makes a big difference.”

“Previously, their habit might have been to put these items wherever—their keys go here, they have their sunglasses on their head and then they put them down somewhere else. The idea is that they

need to find some central place to put everything. That's a huge complaint we get—'I can't find my phone,' or 'I have to go to work and I can't find my keys!'"

Yet another strategy that seems to quickly gain traction with the Veterans taking part in the trial is visualizing tasks to remember to do them. Psychologists know that when people take in information with multiple senses—for example,

not just hearing it, but somehow seeing it also—they are more likely to remember it.

"You tend to hang on to it better," says Jak. "If you saw something and then someone talked to you about it, and then later you touched it with your hand, you're going to have a way better chance of remembering"

The therapists teach participants to visualize in their mind's eye what they hear—to

create a mental picture. Jak says, "You can say to yourself, I have to take the meat out of the freezer when I come home, but if you picture yourself opening the freezer and taking out the hamburgers, that's better."

She adds: "These are strategies that are often useful for perfectly healthy people. We all forget stuff." ★

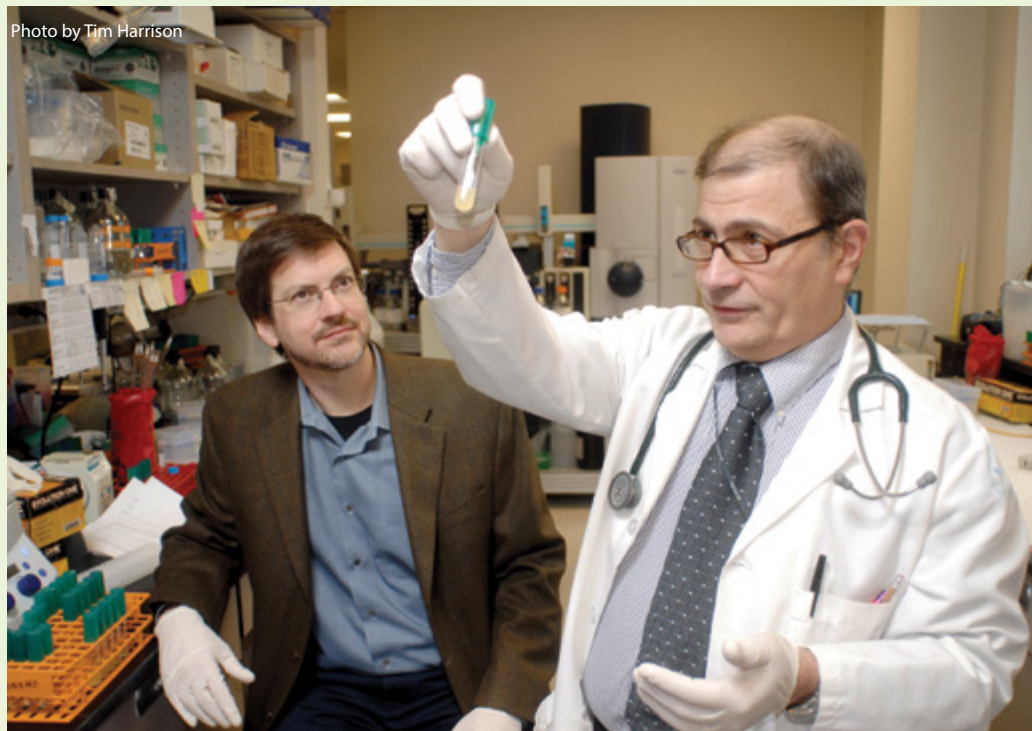
## Cleveland VA infectious-disease researcher receives international award

Robert A. Bonomo, M.D., chief of the medical service at the Louis Stokes Cleveland VA Medical Center and a longtime leader in infectious-disease research, received the 2016 Excellence Award from the European Society of Clinical Microbiology and Infectious Disease (ESCMID).

Bonomo is the first non-European to receive the award. It was established in 2006 to recognize lifetime contributions to the fields of clinical microbiology and infectious diseases.

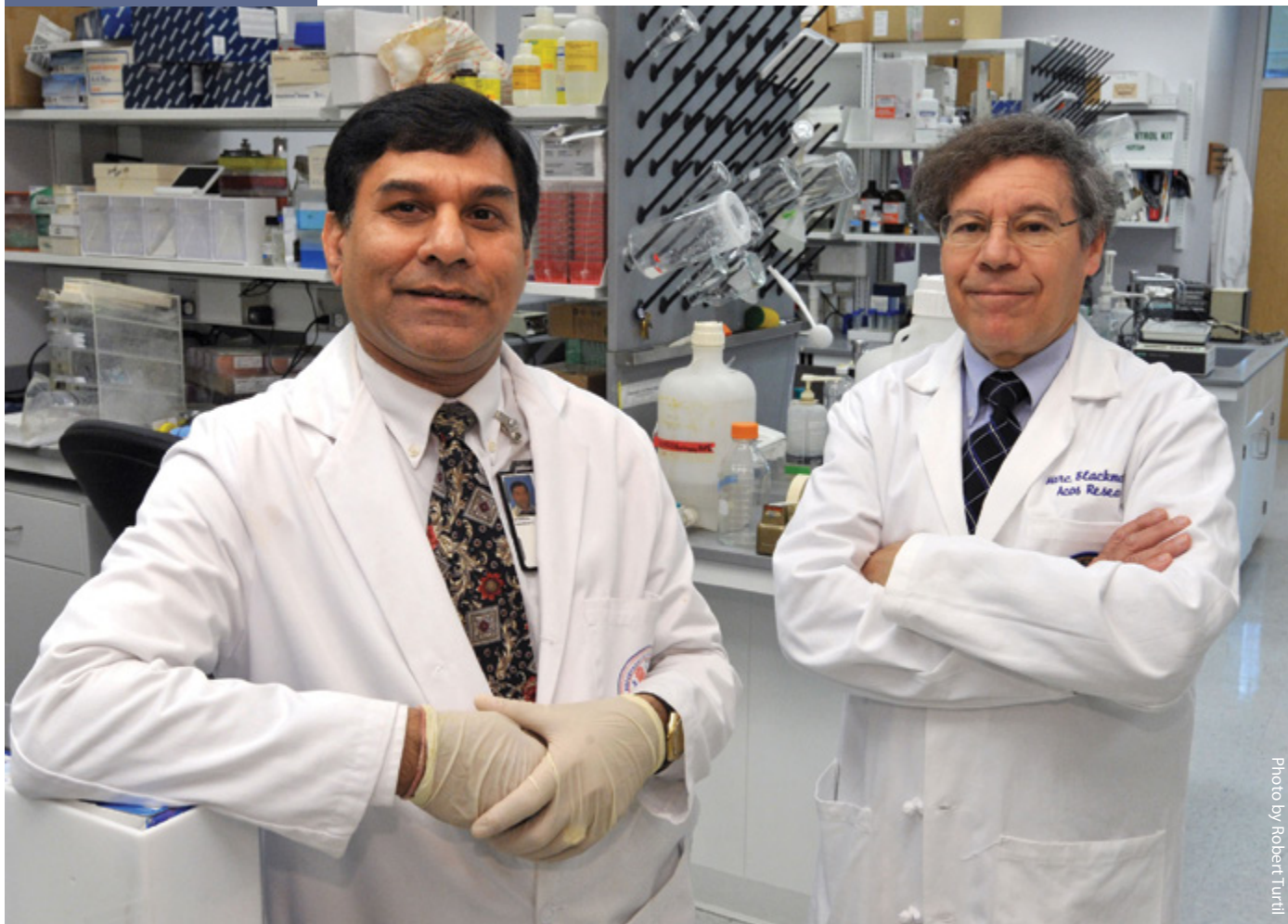
In addition to his VA role, Bonomo is a professor of medicine, pharmacology, molecular biology, and microbiology at Case Western Reserve University School of Medicine.

[Read more at www.research.va.gov/about/awards](http://www.research.va.gov/about/awards)



Cleveland VA researcher Dr. Robert Bonomo (right) and colleague Dr. Mark Adams, now with the J. Craig Venter Institute, have been studying the genetic make-up of *A. baumannii*, a species of bacteria that is resistant to most antibiotics.





## Lab team aims to block blood supply of invasive breast cancer

In lab studies using mice, a team at the Washington, D.C., VA Medical Center has found that blocking a certain protein with a lab-made antibody can choke off the blood supply to aggressive breast tumors and thwart their growth.

Cancer is a hungry disease. Solid tumors in the breast or other organs need new blood vessels to feed them and keep them growing. In lab studies using mice, a team at the Washington, D.C., VA Medical Center has found that blocking a protein called annexin A2 can choke off the blood supply to aggressive breast tumors and thereby thwart their growth.

In their latest study published in the journal *Cancer Letters* on April 1, 2016, Dr. Mahesh Sharma and his team treated human breast tumors implanted

in mice with an antibody the team developed. The researchers followed the mice for nearly six months—their longest-term results yet—and found a 67 percent shrinkage in the tumors. Tumors in untreated mice continued to grow rapidly.

The treatment that was injected into the mice is called anti-annexin A2 monoclonal antibody. Antibodies are found naturally in the body, as part of the immune system. Lab-made versions started emerging in cancer treatment within the past decade. There are now nearly a dozen FDA-approved



◀ Drs. Mahesh Sharma (left) and Marc Blackman are exploring ways to cut off tumors' blood supply and thereby keep them from growing and spreading.

cancer treatments based on the approach. The advantage of the drugs is that they act only on cancer-specific proteins and leave healthy cells alone.

Sharma's lab was among the first to show that unlike other proteins involved in blood clotting and new blood vessel growth, annexin 2 appears to be activated only when cancer is present.

The latest experiments in Sharma's lab also help explain how the anti-ANX A2 antibody works: By blocking annexin 2, it disrupts production of plasmin, an enzyme that causes new blood

vessels to grow. The paucity of plasmin in turn affects enzymes called matrix metalloproteinases, or MMPs. The enzymes are found in high amounts in patients with aggressive breast cancer. Scientists believe they are important drivers of the blood vessel growth that enables cancer to spread.

As early as the 1990s,

**The advantage of the drugs is that they act only on cancer-specific proteins and leave healthy cells alone.**

researchers tested MMP inhibitors in clinical trials. But the results were disappointing, as the drugs proved toxic to healthy muscle and bone.

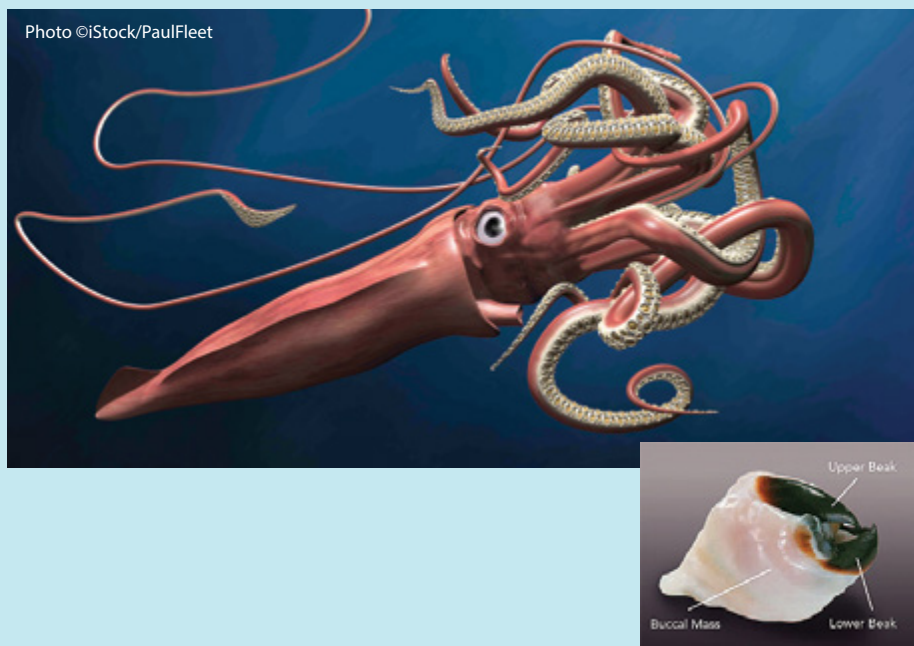
Sharma's team believes their antibody—which indirectly drops active MMP levels—may be a safer and more viable approach.

For the most part, the group's current studies, funded by VA and the Department of Defense, rely on a technique known as xenografting: Human tumors are transplanted into mice that are genetically engineered to lack an immune system, so they don't reject the foreign tissue. The method is thought to be more useful than studying an agent's effect on cancer cells in a Petri dish, or on a tumor that originates within an animal.

Further lab studies are needed before the group can test the therapy in a human clinical trial. Sharma hopes that targeting annexin 2 and its downstream mechanisms proves to be an effective strategy to beat not only invasive breast cancer, but other aggressive tumors as well. ★

## Presidential awards to three VA investigators

VA researcher Dr. Paul Marasco is looking to the squid beak for inspiration in developing new lab-made materials to boost the comfort of prosthetic devices. Learn more about the work of Marasco and other recent VA recipients of Presidential Early Career Awards for Scientists and Engineers at [www.research.va.gov/about/awards](http://www.research.va.gov/about/awards)



## New study reports on **suicidal thinking among Veterans**

Nearly 14 percent of Veterans reported suicidal thinking at one or both phases of a two-year VA study. The study involved more than 2,000 men and women who took part in the National Health and Resilience in Veterans Study.

Nearly 14 percent of Veterans reported suicidal thinking at one or both phases of a two-year VA study.

The study, now online, is slated for publication in the June 2016 issue of the *Journal of Affective Disorders*.

The finding is based on a nationally representative sample of more than 2,000 U.S. Veterans who were surveyed twice as part of the National Health and Resilience in Veterans Study, led by Dr. Robert Pietrzak of the Clinical Neurosciences Division of VA's National Center for PTSD. The first wave was conducted in 2011, the second in 2013.

Each time, the Veterans were asked whether they had experienced suicidal thoughts in the past two weeks. They answered a host of other questions as well, enabling the researchers to glean insights about factors associated with suicidal thinking.

About 86 percent of the Veterans denied having any such thoughts, both times they were asked. About 5 percent had “chronic” suicidal thinking: These Veterans reported suicidal thoughts in the past two weeks both times they were surveyed, two years apart.

Nearly 4 percent had “remitted” suicidal thinking: They reported suicidal thoughts in wave 1 but not wave 2. And 5 percent reported the converse: They reported such thoughts only during the second survey.

Combined, 13.7 percent of the total sample reported suicidal thinking at either or both time points.

### Comparisons with general population

It's difficult to compare this prevalence rate to that of U.S. adults in general. Studies on suicide vary widely in their methods—for example, how questions are worded, and the time frames they cover. And studies often focus on particular age brackets or

other subgroups.

One general reference point might be a study by the Centers for Disease Control and Prevention, published in 2011, in which 3.7 percent of U.S. adults reported having suicidal thoughts in the past year. By that yardstick, the rates in the new study are high.

That would fit with some other research showing that a greater proportion of Veterans experience suicidal thinking—as well as attempts, and deaths by suicide—relative to the general population. One oft-cited VA study found that Veterans, while making up only about 13 percent of U.S. adults, account for about 22 percent of suicides. Another study, from 2007, found that compared to civilians, Veterans were twice as likely to die by suicide.

In any case, the new results offer some fresh insights.

For one, they highlight how suicidal ideation can come and go, at least within the span of a couple of years. This somewhat challenges past findings that suggest that suicidal thinking tends to be a longer-term problem.

“Our results...highlight the dynamic nature of [suicidal ideation],” write the researchers, “as evidenced by the meaningful proportion of U.S. veterans reporting changes in suicidal ideation over time.”

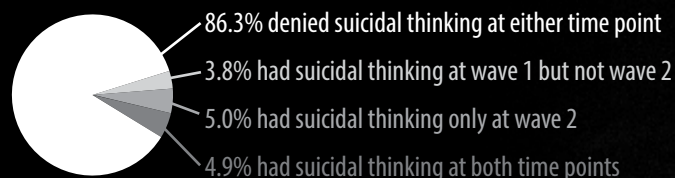
That underscores the need for ongoing periodic monitoring—not just a one-time screening, say the investigators.

Among those Veterans who reported suicidal thinking only at wave 2, 65 percent had never engaged in any mental health treatment. The researchers say this is another finding that points to the need for more outreach.

Not surprisingly, higher levels of psychiatric

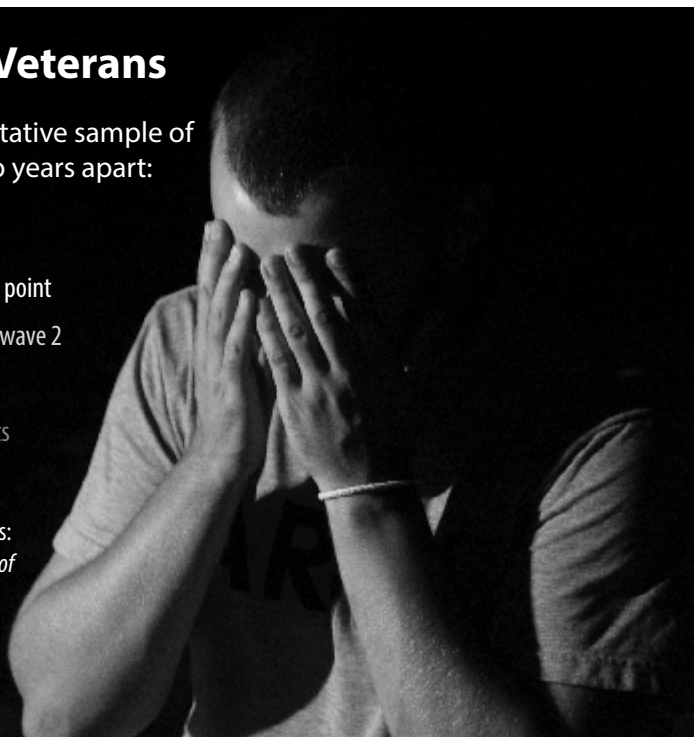
## Suicidal thinking among U.S. Veterans

The following data are from a nationally representative sample of 2,157 U.S. Veterans who were surveyed twice, two years apart:



Source: "Nature and determinants of suicidal ideation among U.S. veterans: Results from the national health and resilience in veterans study," *Journal of Affective Disorders*, online March 2, 2016.

Infographic by Michael Escalante, VA Research Communications (April 2016)



distress, physical health problems, and substance use history predicted chronic suicidal thinking.

### The role of social connectedness

Social connectedness—widely seen as a major buffer against suicide risk—emerged in the study as a factor associated with the remission of suicidal thinking. By the same token, Veterans who reported less social support at wave 1 were also more likely to report the onset of suicidal thinking at wave 2.

However, for many of the Veterans reporting chronic suicidal thinking, social support did not appear to help that much. The researchers say that for these Veterans, addressing psychiatric and physical health, and substance use problems, may be more critical.

The research team points to several limitations in their study. For one, it covered only a two-year period, so the researchers can't draw conclusions about the longer-term course of suicidal thinking. Also, a third of the sample who responded to wave 1 did not complete the wave 2 survey. If those who dropped out were in fact more likely to be troubled

by suicidal thinking than those who stayed with the study, that could mean the prevalence of suicidal thinking was underestimated.

Another limitation was that the survey did not ask about certain factors that could add to the understanding of what drives suicidal thinking, such as financial and interpersonal stress.

Overall, the researchers say the findings highlight the importance of addressing mental and physical health problems, and bolstering sources of social support, to help prevent suicidal thinking—and to promote its remission—in Veterans.

Lead author on the study was Dr. Noelle Smith, who was with the VA Connecticut Healthcare System, National Center for PTSD, and Yale School of Medicine when the research was conducted. She is now with the James A. Haley Veterans' Hospital and the University of South Florida's Morsani College of Medicine in Tampa. She collaborated with colleagues from VA, Yale, and the University of Colorado. The National Health and Resilience in Veterans Study is funded by VA's National Center for PTSD. ★





# RESEARCH CURRENTS

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

## Did you know?

May is ALS Awareness Month. ALS—short for amyotrophic lateral sclerosis—is a progressive neurodegenerative disease that kills nerve cells in the brain and spinal cord. As a result, the brain becomes unable to control the body's muscles. The disease often leads to total paralysis, and the average life expectancy for those affected is under five years. For reasons that are still unclear to researchers, Veterans are about twice as likely to develop ALS, compared with the general public. VA researchers participate in the National ALS Registry. By collecting data on people with ALS, scientists hope to learn more about what causes the disease, and how to prevent or treat it.



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