

VA



U.S. Department of Veterans Affairs

Veterans Health Administration
Office of Research and Development



Afghanistan/Iraq Alzheimer's Disease
Arthritis **Cancer** *Cardiovascular Disease*
Caregiving **Depression**
Diabetes *Gastrointestinal Health*
Health Care Disparities **Mental Health**
Hepatitis C *Homelessness*
Infectious Disease *Kidney Disease* *Hearing Loss*
Obesity *Pain Management*
Parkinson's Disease *Personalized Medicine*
Posttraumatic Stress Disorder *Prosthetics/Limb Loss*
Spinal Cord Injury *Substance Use Disorders* *Suicide Prevention*
Traumatic Brain Injury *Vision Loss* **Women's Health**

Research **Advances**

January 2014





Foreword

For nearly 90 years, the Veterans Affairs Research and Development program has been improving Veterans' lives.

VA Research is unique in that it is the only program in the United States focused entirely on conducting research to address the full spectrum of Veterans' health needs. The program benefits from being part of a comprehensive health care system with state-of-the-art electronic medical records. Plus, most VA researchers are also clinicians who are directly involved in providing care to Veterans. Through this dynamic combination of factors, VA has become a model for conducting scientifically rigorous research—in the lab, the clinic, and the community—that is highly relevant to patients' needs. Through a variety of initiatives, VA is now working more effectively than ever to translate the results of its research into everyday care to benefit Veterans and their families—and in many cases, all Americans and people around the world.

We invite you to read through this publication and to visit our website (www.research.va.gov) to view the Web version, which contains links to all the references cited.

- Announced the formation of new research consortia, funded jointly by VA and the Department of Defense, to study **PTSD** and **traumatic brain injury**.
- Published results from a major study of abdominal aortic **aneurysms** that provided valuable guidance on surgical treatment options.
- Funded new types of centers of excellence—Collaborative Research to Enhance Transformation and Excellence (CREATE) and Centers of Innovation (COINs)—that promise to speed the **translation of research results** into clinical practice in VA.
- Reported results from a large **prostate cancer** trial that shed important light on the relative benefits and risks of surgery and radiation.

2013 Highlights

- Played a key role in University of Pittsburgh-led research on a brain-computer system that enabled a woman with total **paralysis** to control a robotic arm using only her thoughts.
- Published findings from the first rigorous, large-scale comparison of different methods to wean patients with **breathing difficulties** from ventilators.
- Reported that **infections** acquired in the hospital are less likely to occur when acute-care patients are bathed daily with a simple, inexpensive antiseptic.
- Began collaboration with the Department of Defense on a \$6.5 million study to learn whether **Vietnam Veterans** with traumatic brain injury or PTSD are at higher risk for Alzheimer's disease as they age.
- Reported positive results from one of the largest studies to date on the use of videoconferencing to deliver evidence-based psychotherapy for Veterans with **PTSD**.
- Found that many Veterans suffering from blast concussions may have hormone deficiencies that mimic some of the symptoms of PTSD and depression, underscoring the value of hormone-based treatments for **traumatic brain injury**.
- Published new data indicating that Veterans exposed to Agent Orange are not only at higher risk for **prostate cancer**, but also more likely to have aggressive forms of the disease—information that could help guide screening and treatment.
- Disseminated information to gastroenterologists on innovative research-based methods to improve the cancer-detection rate of **colonoscopy**.
- Contributed to new clinical guidelines for **cholesterol** management.
- Collaborated with researchers in Europe and Israel to develop and test a new type of “artificial pancreas” that could lead to major improvements in care for **diabetes**, and that promises to impact cell therapy for a variety of other chronic health conditions.



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Afghanistan/Iraq

Recent Advances

Using the Internet to help smokers quit — A four-year study at the Durham VA aims to learn whether OEF/OIF Veterans who smoke will be more successful at quitting with the help of the website QuitNet. More than 400 Veterans are taking part in the research, due to end in early 2014. Based on U.S. Public Health Service guidelines, QuitNet features chat rooms, advice from experts, medication tips, buddy match-ups, social media space, and other tools to support smokers in their quest to stop smoking. Half of the Veterans in the study have received premium membership to QuitNet. They have also been offered nicotine replacement therapy from VA. The other study participants are getting standard care. This means referral to a clinic geared to help returning Veterans quit smoking. (www.clinicaltrials.gov, NCT01001546)

Study to examine lung function — VA has begun a study of health effects related to burn-pit exposure during deployment to Iraq or Afghanistan. An October 2011 report by the Institute of Medicine suggested a link between burn pits and compromised lung function. Burn pits are open pits where trash and other waste is burned. Completed studies on environmental exposures in Afghanistan/Iraq and lung health have shown mixed results. (*Federal Register announcement of VA study, February 2013*)

Similar deployment stressors among male, female Veterans — A survey of more than 3,300 OEF/OIF Veterans found that although male and female Veterans experienced different stressors during deployment, their readjustment to civilian life was similar. However, women were nearly nine times as likely to report sexual harassment as a source of stress. Men were more likely to report combat as a source of stress, although 73 percent of women were exposed to some combat or to combat aftermath. As for effects of stress, men and women were equally likely to report PTSD. Men were more likely to report problematic alcohol use, and women were slightly more likely to report anxiety and depression. The study, from the Boston VA, is one of the first and largest to compare male and female experiences of OEF/OIF Veterans. (*Journal of General Internal Medicine, July 2013*)

VA has a comprehensive research agenda to help the newest generation of Veterans—those returning from operations Enduring Freedom, Iraqi Freedom, and New Dawn. In addition to exploring new treatments for traumatic brain injury and other complex blast-related injuries, VA researchers are examining ways to improve the delivery of health care services for these Veterans and promote their reintegration back into their families, communities, and workplaces.

Facts about OEF/OIF Veterans

- Due to improved body armor and battlefield medicine, the patterns of injury in OEF/OIF Veterans differ from those in previous wars. For example, OEF/OIF soldiers have lower numbers of chest injuries, but higher numbers of head and neck injuries, compared with soldiers in Vietnam and World War II. They also have fewer gunshot injuries but more blast-related injuries.
- Many OEF/OIF soldiers have returned home with complex, multiple injuries. These can include brain and spinal cord injuries, vision and hearing loss, nerve damage, burns, amputations, musculoskeletal injuries, infections, posttraumatic stress disorder, chronic pain, and problems readjusting to civilian life.



Alzheimer's Disease

Recent Advances

Beta-blockers reduce Alzheimer's risk — Men who take beta-blockers for high blood pressure appear to be at lower risk for Alzheimer's, and for dementia in general. Two studies from the Hawaii VA focused on men who were part of the Honolulu-Asia Aging Study. One study followed 2,197 men with high blood pressure for up to 18 years. About 39 percent developed problems with thinking and memory. Men taking only beta-blockers for their high blood pressure had a 31 percent lower risk of developing these problems, compared with men who took other drugs. A second study examined the brain tissue of a group of deceased men who had been part of the study. Their brains were analyzed for lesions characteristic of Alzheimer's disease and dementia. Men without high blood pressure had the lowest numbers of lesions. Among men with high blood pressure, those taking only beta-blockers had fewer lesions than men taking other drugs. (*Neurology, September 2013*)

Nursing home intervention — A program called STAR-VA helps to lessen challenging dementia-related behaviors, such as aggression, wandering and resistance to care. The program was tested in 17 VA nursing homes. A psychologist or similar care provider led a team to establish a personalized plan for each patient. The program identified triggers to challenging behaviors, as well as consequences. Nurses and other personnel worked to improve communication with patients and scheduled personalized, pleasant experiences (such as taking a walk outside or listening to an audio book). In addition to reducing challenging behaviors, the program reduced depression and anxiety. (*Psychological Services, online Aug. 12, 2013*)

Exercise may prevent dementia, even in oldest old — A VA study confirms that physical activity reduces the risk of dementia in very elderly women. Researchers from the San Francisco VA followed 1,249 women for five years. The average age of the women at the beginning of the study was 83. After five years, women 85 and older were tested. Those who had spent the most time walking were about half as likely to show symptoms of dementia, compared with those who did the least amount of exercise. Other studies have shown a benefit of exercise in younger people; this was the first study to focus on people 85 and older. (*American Journal of Geriatric Psychiatry, online July 3, 2013*)

Areas of focus for VA research on Alzheimer's disease include finding potential drug therapies for prevention and treatment, exploring the genetic and environmental causes of the disease, studying the best ways to provide long-term care, and evaluating new programs to support caregivers.

Additionally, VA researchers are working to better understand the connection between Alzheimer's and other chronic diseases, such as diabetes.

Facts about Alzheimer's Disease

- Alzheimer's disease is the sixth leading cause of death in the United States.
- In Alzheimer's disease, nerve cells in the brain become damaged or die. This affects thoughts, memory, and language.
- Symptoms range from mild forgetfulness to the inability to perform everyday tasks.
- People with Alzheimer's have high levels of beta-amyloid plaque in their brains. They also have tangled ribbons of a protein called tau.
- Alzheimer's is estimated to affect some 5.2 million Americans. By 2050, it could affect as many as 13.8 million.
- The annual indirect and direct costs of care for Alzheimer's disease in the U.S. are estimated at \$203 billion.




Arthritis

Recent Advances

Nanomedicine may halt arthritis progression — A protein called vasoactive intestinal peptide, or VIP, has anti-inflammatory effects. VIP has shown promise in treating arthritis, but the protein breaks down quickly. When VIP is combined with a group of molecules called sterically stable micelles (SSM), it is stabilized for longer time periods. Researchers from Jesse Brown VA Medical Center in Chicago tested the effects of VIP-SSM on arthritis in mice. The protein reduced joint swelling and stopped the destruction of bone and cartilage. It also reduced levels of inflammatory and autoimmune blood markers that are used to test for rheumatoid arthritis. There were no side effects. (*Molecular Pharmaceutics*, Feb. 4, 2013)

Program increases knee replacement in African Americans — African Americans are less likely than whites to undergo knee replacement surgery. An educational video or brief counseling session may help. Philadelphia VA researchers enrolled 639 African-American patients from three VA clinics. All had moderate to severe osteoarthritis of the knee. They were randomized to receive brief counseling, the viewing of an arthritis decision-aid video, both interventions, or neither. Before the intervention, 67 percent of the patients were willing to consider knee replacement surgery. This rose to 75 percent after the interventions. Twelve months later, patients who had any type of intervention were more likely to discuss their knee pain with their doctor and to receive a referral to an orthopedic surgeon. (*Arthritis and Rheumatism*, May 2013)

Extra drug gives no added relief to people with gout — The drug riloncept provides no extra benefit to people with acute gouty arthritis, according to a clinical trial at the San Diego VA that included 225 adults. One-third of the patients received injections of riloncept, which blocks a protein that causes inflammation. One-third received pills containing indomethacin, the standard drug given for gout flare-ups. The final one-third received both drugs. All groups reported pain relief, but riloncept did not treat pain better than indomethacin. And people who took both drugs did not feel greater pain relief than people in the other groups. (*Arthritis Research and Therapy*, online Feb. 1, 2013)

Arthritis describes a complex family of diseases that affect people of all ages.

VA researchers are working to understand the biological causes of arthritis, with a focus on osteoarthritis and rheumatoid arthritis. VA research includes understanding the risks for the diseases, how other conditions (such as PTSD or alcohol dependence) may affect arthritis severity, the most effective medical and intervention strategies, and the risks and outcomes of joint replacement surgery.

Facts about Osteoarthritis and Rheumatoid Arthritis

- Arthritis is an umbrella term for more than 100 conditions that affect the joints, muscles, cartilage, and bone.
- Osteoarthritis, or degenerative joint disease, is one of the most common forms. According to the Arthritis Foundation, it affects up to 27 million Americans, most of them elderly.
- Rheumatoid arthritis is the second most common type of arthritis, affecting about 1.3 million Americans. About 70 percent are women. In people with rheumatoid arthritis, the body's immune system attacks its own joint tissue, causing inflammation. Researchers have identified genes that confer an increased risk for rheumatoid arthritis.



Complementary & Alternative Medicine

Recent Advances

Johrei therapy shows promise for sleep difficulty — More than 3 million Japanese families practice Johrei, which means “purification of the spirit.” The idea behind Johrei, a non-touch healing therapy, is that the body can purify itself. Southern Arizona VA researchers tested the effects of Johrei on sleep disruptions in mice. They purposely used animals rather than people to isolate the physiological effects of the therapy and rule out any placebo effect. Some mice were disrupted during sleep. Others were disrupted and given Johrei therapy. The researchers monitored sleep using certain brain tissue markers. They found that sleep quality was substantially better among the mice receiving the therapy. Johrei therapy is under study in the U.K. for breast cancer and eczema. (*Explore, March–April 2013*)

Meditation and mindfulness for PTSD — Puget Sound VA researchers found that both meditation and mindfulness improve PTSD symptoms. In the meditation study, Veterans received weekly training in loving-kindness meditation for 12 weeks. After three months, they showed reduced PTSD symptoms, as well as reduced depression. A separate study analyzed the effects of mindfulness-based stress reduction on PTSD. After four months, those in the stress reduction program had better mental-health-related quality of life, fewer PTSD symptoms, and less depression. (*Journal of Traumatic Stress, August 2013; Journal of Clinical Psychology, January 2013*)

Acupuncture to ease insomnia in OIF/OEF Veterans — A VA study is underway to explore how group ear acupuncture may help OIF and OEF Veterans with PTSD-related insomnia. A 2009 review of 46 published studies showed that acupuncture was at least as effective as sleep-inducing medications. The War-Related Illness and Injury Study Center at the VA Medical Center in Washington, DC, provides individual acupuncture treatments and group ear acupuncture treatments. Ear acupuncture focuses on specific spots on the ear that are thought to promote health and well-being. (www.warrelatedillness.va.gov)

Many forms of complementary and alternative medicine, commonly referred to as CAM, are popular among Veterans. VA researchers are conducting rigorous scientific evaluations of CAM treatments that have shown promise in pilot studies or small clinical trials. In some cases they are conducting lab studies to explore the physiological and biological basis of these treatments. Among the therapies under investigation are meditation, acupuncture, massage, yoga, and nutritional or herbal supplementation.

Facts about Complementary and Alternative Medicine

- According to a 2011 survey by VA's Health Care Analysis and Information Group, the use of complementary and alternative medicine has grown substantially in VA over the past decade. About 9 in 10 VA facilities now directly provide CAM therapies or refer patients to outside licensed practitioners.
- In a survey of 125 VA facilities:
 - 101 said they provide meditation
 - 93 provide stress management/relaxation therapy
 - 82 provide guided imagery
 - 62 provide animal-assisted therapy
 - 58 provide acupuncture
 - 44 provide yoga



Cancer

Recent Advances

Diagnosing pancreatic cancer earlier — A type of lab-engineered molecule called a monoclonal antibody may allow for diagnosing pancreatic cancer more than two years before symptoms appear. Researchers at the Philadelphia VAMC tested whether the monoclonal antibody Adnab-9 attached to stool samples from people with or without pancreatic cancer. They found that it could differentiate cancer patients from healthy controls. More than 90 percent of pancreatic cancer cases are diagnosed at later, less curable stages, making the chances of survival quite low. Currently, only two percent of people diagnosed with metastatic pancreatic cancer will survive past five years. (*Digestive Diseases and Sciences, March 2013*)

Curcumin active against drug-resistant cancer cells — A compound found in the spice turmeric may make drug-resistant cancer cells vulnerable to chemotherapy. Researchers from the John D. Dingell VAMC in Detroit tested difluorinated curcumin on drug-resistant colon cancer cell lines in a mouse model. Curcumin blocked the activity of a microRNA, miR21, which is found at high levels in drug-resistant colon cancer cells. As a result, miR21 could no longer block the expression of a gene called PTEN, a common tumor suppressor gene. Reactivating PTEN makes the drug-resistant cancer cells less “cancer-like” and could make them susceptible to chemotherapy. (*PLoS One, July 24, 2013*)

Financially burdened patients skip medicine — Nearly half of cancer patients in a Durham VAMC study did not take medicine as directed because they were trying to save money. The study included 164 patients who were part of a national copay assistance program. Due to cost, 27 percent said they did not fill a prescription. Twenty-five percent filled a partial prescription, and 22 percent took less medication than prescribed. Four percent took medicine that was prescribed for someone else. Those with a prescription drug plan were 73 percent less likely to try one of these money-saving strategies. The unemployed were more than six times as likely to try at least one. (*Journal of Oncology Practice, November 2013*)

VA conducts a broad array of research on cancers common among Veterans. These include diseases such as prostate, lung, colorectal, bladder, kidney, pancreatic, esophageal and breast cancer, as well as lymphomas and melanomas. VA researchers carry out lab experiments aimed at discovering the molecular and genetic mechanisms involved in cancer; epidemiologic studies looking at the causes of disease; clinical trials to evaluate new or existing treatments; and studies focused on improving end-of-life care.

Facts about Cancer

- More than 1 million Americans are diagnosed with cancer each year. Half of men and one-third of women will get cancer in their lifetime.
- Cancer is a general term for more than 100 diseases. In all forms of cancer, cells in the body begin to grow and multiply abnormally. They can spread, invading and destroying normal tissue.
- Many factors can combine to increase the risk of cancer. They include genetic makeup and exposures to radiation, air pollution or other toxins, as well as more modifiable, behavioral factors such as lack of exercise, smoking, and poor eating habits.



Cardiovascular Disease

Recent Advances

Drug reduces mortality in heart-failure patients — The drug serelaxin improves breathing problems and reduces the risk of mortality in people with heart failure. San Francisco VAMC researchers enrolled 1,161 patients and randomized them to receive an intravenous infusion of either serelaxin or placebo. All patients had been admitted to the hospital with symptoms of heart failure. The primary endpoint was relief of dyspnea, or shortness of breath. Patients receiving serelaxin did have fewer episodes of shortness of breath. They also had a 37 percent lower risk of mortality during the first 180 days: In the serelaxin group, 42 patients died, compared with 65 in the placebo group. Serelaxin is a manufactured form of human relaxin-2, a protein that, among other functions, helps to control blood flow to the heart and kidneys. (*Lancet*, Jan. 5, 2013)

AnkleBot helps stroke survivors walk again — A two-year VA study is focused on a rehabilitative robot that may help stroke survivors improve their gait even years after a disabling attack. Researchers from the Baltimore VAMC are testing the device, which is used on a treadmill. Electronic plates monitor pressure in each foot and feed the data to a computer. The computer drives pistons on either side of the ankles, which help with balance. As a person's gait improves, the computer does less work. After two months, one participant could walk 25 feet without assistance and climb stairs two at a time. (*Journal of Rehabilitation Research and Development*, Vol. 50, No. 14, 2013; *NeuroRehabilitation*, 2013)

New anti-inflammatory drug shows promise — High blood levels of C-reactive protein (CRP) indicate inflammation in the body. Increased CRP puts people at risk for diabetes, high blood pressure and cardiovascular disease. Researchers at the Mather (Calif.) VAMC have identified a molecule that blocks the activity of CRP in lab tests. It showed the same activity in a rodent model. Blocking CRP activity resulted in lower blood levels of other inflammatory molecules. (*Metabolic Syndrome and Related Disorders*, June 2013; *International Journal of Cardiology*, Oct. 9, 2013)

Areas of focus for VA research on cardiovascular disease include evaluating and developing new treatments, probing the genetic and lifestyle causes of cardiovascular disease, and developing new rehabilitation methods, especially for stroke. Studies range from biomedical lab experiments on animal models of heart disease to large, multisite drug studies and other clinical trials involving thousands of patients.

Facts about Cardiovascular Disease

- Cardiovascular disease is an umbrella term for diseases and conditions that affect the heart and blood vessels. These include stroke, heart attack, congestive heart failure, coronary artery disease, and congenital heart defects.
- Cardiovascular disease is America's number-one killer, causing about 1 of every 4 deaths in the United States. And 1 in 3 Americans has some form of CVD.
- CVD is the leading cause of hospitalization in the VA health care system.
- The strongest risk factors are high blood pressure, high LDL ("bad") cholesterol, and smoking.
- Heart disease and stroke cost more than \$312 billion a year.



Caregiving

Recent Advances

Caregivers boost self-care programs for diabetes, depression — People with diabetes or depression are more likely to participate in a self-care program if an informal caregiver, such as a family member, is also involved. Researchers from the Ann Arbor VA studied 727 people invited to participate in a yearlong Interactive Voice Response (IVR) program. Of these, 65 percent chose to have feedback on their progress shared with a caregiver. Patients whose caregivers also were involved were 36 percent more likely to fully participate. IVR enables patients to communicate with health care providers via a mobile or landline phone. Patients listen to recorded messages and respond to questions using the keypad. They then receive tailored information based on their responses.

(Medical Care, March 2013)

Study predicts increased need for caregivers — People may live to older ages in the future, but more than half will need someone to help them with daily activities, says a study from the San Francisco VAMC. Researchers interviewed more than 8,000 people who were part of the National Health and Retirement Study. All were at least 50 when they enrolled in the study, and all died between 1995 and 2010. Among those who lived into their 90s, half needed a caregiver during their final years. And 70 percent had trouble walking during the last two years of their life, regardless of how old they were when they died. Women were more likely than men to be disabled near the end of life. *(JAMA Internal Medicine, Sept. 9, 2013)*

Caregiver support and chemotherapy — Ann Arbor researchers are completing a five-year study to see if Web-based support for caregivers can help Veterans undergoing chemotherapy. The study is enrolling 308 patient-caregiver teams. All will receive 10 weeks of automatic symptom assessment via phone. Half also will receive personalized feedback on symptom management and problem-solving advice, both to the patient and the caregiver. So far, preliminary results show that those enrolled with caregivers can tolerate more chemotherapy and are 60 percent less likely to discontinue it. ("*Web-based support for caregivers of Veterans undergoing chemotherapy*," www.hsrd.research.va.gov)

Caring for an injured, disabled or ill family member can entail emotional, physical and financial strain. Several VA studies are looking at the impact of caregiver education and stress-reduction programs on caregiver and Veteran health and wellness. Studies focus both on the short- and long-term needs of caregivers, as many of these individuals will provide care for years or even decades. VA investigators are also developing and refining questionnaires to help better understand and address caregiver needs.

Facts about Caregiving

- Estimates vary widely on how many Americans are now caregivers for loved ones, but the Department of Health and Human Services estimates that up to 37 million U.S. adults will be caregivers by 2050, an 85 percent increase from 2000.
- The burden of caregiving tends to fall disproportionately on women. Nationwide, about 65 percent of caregivers are female. Among caregivers of Veterans, 96 percent are female.
- Because of the younger ages at which Veterans become disabled, caregivers of Veterans are more likely to have the caregiving role for more than 10 years.



Depression

Recent Advances

ACT training improves outcomes — Acceptance and commitment therapy (ACT) is effective for depression, says a study based at the Palo Alto VA. Nearly 400 VA therapists nationwide treated 745 patients. The patients' average depression survey scores dropped from 30 ("severe depression") to 19 ("mild depression"). ACT helps patients stay in the present moment and allow their thoughts and feelings to come and go without struggling with them. (*Behaviour Research and Therapy, September 2013*)

Brain differences in older people with depression — A study at the San Francisco VA tracked brain changes in people with late-life depression. Researchers conducted functional magnetic resonance imaging (f-MRI) on 22 people with and 12 people without the condition. Those with late-life depression had a thinner cortex in the right frontal, parietal, and temporal regions of the brain. These patients then underwent 12 weeks of psychotherapy. Half did not respond. Compared with those who did respond, non-responders had a thinner cortex in several areas of the brain. The cortex is the outermost layer of brain tissue; it is also referred to as "gray matter." Further research could lead to customized treatment based on brain morphology. (*American Journal of Geriatric Psychiatry, August 2013*)

Low blood pressure linked with depression, anxiety — People 50 and older with low blood pressure are more likely to have symptoms of depression or anxiety, says a study from the Palo Alto VA. The study involved 4,179 people ages 50 to 104. Besides taking blood-pressure measurements, researchers had people complete two common questionnaires to assess depression and anxiety. Anxiety was linked with low systolic blood pressure (the first, higher number), and depression with low diastolic blood pressure (the second, lower number). Other studies have suggested a relationship between extremes in blood pressure and mental health conditions, but past evidence has been conflicting. The research may help to better identify older people at risk for depression and anxiety. (*International Journal of Geriatric Psychiatry, October 2013*)

As part of a comprehensive research agenda to help advance depression care, VA researchers are developing, testing, and implementing new models of primary care that do a better job of screening for and treating the disease. They are also studying ways to improve outcomes for Veterans affected by depression along with other conditions, such as heart disease or diabetes, and exploring the genetic and molecular roots of the condition, with the goal of developing more effective drugs.

Facts about Depression

- In any given year, nearly 1 in 10 U.S. adults will experience depression.
- An untreated episode of depression may last several months, and most people with depression experience repeated episodes over a lifetime.
- About 14 percent of Veterans have been diagnosed with depression, but due to under-diagnosis, the actual percentage is likely higher. Even among those diagnosed, as many as two-thirds receive little or no treatment during the first year after diagnosis.
- Depressed male Veterans are three times as likely as depressed female Veterans to commit suicide. The risk for suicide also is higher in Caucasian Veterans, compared with African Americans.



Diabetes

Recent Advances

Study to find best diabetes drug combination — The Atlanta VA is participating in a new National Institutes of Health study to compare the long-term benefits and risks of four diabetes drugs in combination with metformin. Metformin is the first medication typically used when treating type 2 diabetes. If it does not control the disease, doctors may add one of several other drugs, all of which have lowered blood-sugar levels in short-term studies. However, no long-term study has focused on which drug combination works best and has the least side effects. The four drugs being studied are sulfonylurea, dipeptidyl peptase-4 (DPP-4) inhibitor, glucagon-like peptide (GLP)-1 agonist, and long-acting insulin. The NIH-funded project will compare effects on blood glucose levels, diabetes complications, and quality of life. The study is slated to last five years.

("NIH begins recruitment for long-term study of diabetes drug efficacy," June 3, 2013, www.nih.gov)

Low blood sugar, dementia linked — Diabetics with an episode of low blood sugar may be more likely to develop dementia, according to a study from the San Francisco VAMC. The study included 783 older adults (average age 74) with diabetes. Over 12 years, those who experienced low blood sugar (hypoglycemia) were twice as likely to later be diagnosed with dementia. Adults who developed dementia were three times as likely to later experience low blood sugar. Stroke, heart attack and high blood pressure did not factor into the relationship.

(JAMA Internal Medicine, July 22, 2013)

Poor sleep predicts diabetes — In a VA study that was part of the larger Millennium Cohort Study, sleep apnea and poor sleep quality predicted diabetes, independent of other diabetes risk factors or mental health. Sleep apnea increased risk 78 percent. Trouble sleeping increased risk 21 percent. The study, by researchers at the Puget Sound VA, included 47,093 military members and Veterans with an average age of about 49. There were six years of follow-up. Over that time, 871 people were diagnosed with diabetes. The researchers took other factors into account, such as depression, PTSD, anxiety, older age, and obesity.

(Diabetes Care, October 2013)

VA researchers are studying innovative strategies and technologies—including group visits, telemedicine, peer counseling, and Internet-based education and case management—to enhance access to diabetes care and to improve outcomes for patients. In addition, VA researchers are working to develop better ways to prevent or treat diabetes, particularly in special populations such as the elderly, amputees, minorities, spinal cord injured patients, and those with kidney or heart disease.

Facts about Diabetes

- Diabetes is a chronic disease in which the body cannot produce or properly use insulin. Normally, insulin brings sugar out of the bloodstream and into cells. If the body cannot make insulin or does not respond to it, the sugar stays in the blood, where it damages blood vessels and organs.
- More than 90 percent of adults with diabetes have type 2 diabetes, in which the body produces insulin but does not respond to it properly.
- About a quarter of the Veterans receiving care from VA have diabetes, and more are at risk due to overweight or obesity.



Gastrointestinal Health

Recent Advances

Steroids up risk of low bone density in men — A study of 34,665 Veterans found that men taking steroids for ulcerative colitis were nearly nine times as likely to develop low bone-mineral density, compared with non-steroid users. Southeastern Louisiana VA researchers led the analysis. Data showed that about 30 percent of ulcerative colitis patients used steroids. Among those that did, 15.8 percent had low bone-mineral density. Only 7.1 percent of non-steroid users had low BMD. BMD is a risk factor for fragility fractures. Steroid users were nearly twice as likely to have a fragility fracture. (*Journal of Clinical Endocrinology and Metabolism, June 2013*)

Two IBD medications reduce hospitalizations and surgeries — A study using eight years of data from 176 VA facilities has found that treatment with infliximab and an immunomodulator reduces the one-year risk of hospitalization and surgery in men with inflammatory bowel disease. The study was done by researchers at the Houston VA, in conjunction with university scientists. It included data on more than 20,000 men with either Crohn's disease or ulcerative colitis. Those who received nine months of dual-drug therapy had a 73 percent decreased risk of hospitalization and a 92 percent decreased risk of surgery. Only about 1.5 percent of Veterans in the study received dual-drug therapy. Infliximab (trade name Remicade) has been approved for treating Crohn's disease since 1998. It is also approved to treat ulcerative colitis, rheumatoid arthritis and other conditions. Immunomodulators affect the immune system, either by boosting it or suppressing it, in order to help treat disease. (*Clinical Gastroenterology and Hepatology, October 2013*)

Proton-pump inhibitors work equally well in the obese — People who are obese are more likely to have heartburn, or gastroesophageal reflux disease (GERD). However, treatment with proton-pump inhibitors works just as well in obese patients as in normal-weight ones. A study of patients treated at the Kansas City (Mo.) VA and the University of Kansas showed that weight was not a factor in the success of treatment with esomeprazole. People who were obese before treatment did tend to have more severe reflux symptoms, however. (*Journal of Clinical Gastroenterology, September 2013*)

Areas of focus for VA research on gastrointestinal health include stomach ulcers, irritable bowel syndrome, inflammatory bowel disease, gastroesophageal reflux disease, and gastrointestinal cancers. VA researchers are looking for potential drug therapies, exploring less invasive treatments, and seeking supportive strategies for Veterans during and after treatment.

Facts about Gastrointestinal Health

- Gastrointestinal disorders affect people of all ages. More than 1 million Americans suffer from inflammatory bowel disease (IBD), a term that includes Crohn's disease and ulcerative colitis.
- Both Crohn's disease and ulcerative colitis have increased in Veterans between 1998 and 2009. Meanwhile, in the general population, the diseases have become less common.
- IBD is more common in whites and in younger people; most people are diagnosed before age 30.
- Frequent heartburn, or gastroesophageal reflux disease (GERD), is even more common than IBD. About 1 in 10 Americans experiences GERD symptoms at least once a week. Smoking and obesity can contribute to GERD symptoms, and many foods—particularly fatty, fried, citrus- or tomato-based foods, chocolate, and caffeine—can worsen symptoms.



Gulf War

Recent Advances

Biorepository brain bank to help research — The Gulf War Veterans' Illnesses Biorepository is seeking Veterans from the 1990-91 Gulf War era who would like to participate in research about conditions affecting Gulf War Veterans. Based at the Southern Arizona VA and also involving VA researchers in Boston, the bank collects, processes, and stores specimens and health information and provides the materials to authorized researchers for scientific studies. Veterans who enroll complete surveys about their health every six months to a year, and upon their death, donate their brain and in some cases other body tissue for future research on Gulf War Veterans' illnesses.

(www.research.va.gov/programs/tissue_banking/gwvib)

Brain changes after chemical exposures — Durham VA researchers have shown that exposure to Gulf War-related chemicals causes mood changes and memory problems. Researchers used a rodent model of Gulf War illness. The behavior changes were linked with changes in the volume of the brain's hippocampus, as well as loss of neurons, reduction in the creation of new neurons, and inflammation. The chemicals tested included permethrin, DEET, and pyridostigmine bromide. The first two chemicals are pesticides. The third is meant to protect against the effects of nerve gas. The authors note that anti-inflammatory treatments, as well as treatments that encourage neuron growth, may help with Gulf War illness symptoms. (*Neuropsychopharmacology*, November 2013)

Few long-term effects of depleted-uranium exposure — Some Gulf War Veterans were exposed to depleted uranium through friendly-fire incidents. Exposures included wound contamination with uranium particles, inhalation of particles, and uranium metal fragments embedded in tissue. These Veterans have been surveyed every other year, and show elevated uranium levels in urine. But after 20 years, few uranium-related health effects have been seen. A report by researchers at the Baltimore VA focused on kidney and lung health in this group. Uranium exposure had minimal effects on the kidneys, but some Veterans did show reduced kidney function from exposure to multiple metals. Lung function in this group of Veterans remained normal. (*Health and Physiology*, April 2013)

VA Research is conducting a wide array of studies to better understand and treat the illnesses experienced by many Veterans of the 1990–1991 Gulf War. The efforts are guided by a Strategic Plan for Gulf War Research, developed with input from researchers, physicians, and Veterans themselves. The plan is reviewed annually to make sure it incorporates the latest emerging knowledge.

Facts about Gulf War Veterans' Illnesses

- Nearly 700,000 U.S. troops served in the 1990-1991 Gulf War.
- At least a quarter continue to report troubling health symptoms. The majority have what VA terms "medically unexplained chronic multisymptom illness."
- Others are considered to have chronic fatigue syndrome, fibromyalgia, functional gastrointestinal disorders, or undiagnosed illnesses.
- Exposures during the war included pesticides, vaccines, oil well fires, sarin gas, pyridostigmine bromide (to protect against sarin gas), depleted uranium, chemical and biological weapons, noise, sand, and extreme heat.
- Research has found brain differences in those with symptoms of Gulf War Veterans' illnesses. However, exact causes and reliable treatments are still being sought.



Health Care Disparities

Recent Advances

Racial disparities persist for hip, knee replacements — Birmingham VA researchers analyzed 18 years of Medicare data on hip and knee replacements in Caucasians and African Americans. In 1991, knee replacement surgery was 36 percent less common in African Americans. By 2008, it was 40 percent less common. Disparities in 30-day hospital readmission increased even more sharply. The study did not focus on why knee replacement might be less common in African Americans, nor why outcomes seemed to be worse. (*Annals of the Rheumatic Diseases*, online Sept. 18, 2013)

Females have higher melanoma survival rates — Among white adolescents and adults, females have higher survival rates after treatment for melanoma (skin cancer), according to a study from the Palo Alto VA. The study included 26,107 people who were followed for an average of 7 ½ years. Adolescent males and young-adult males were 55 percent more likely to die of melanoma than females of the same ages. Researchers controlled for the location of the cancer, thickness of the tumor, and whether and how far it had spread. They also controlled for health insurance status and income. Previous studies have found similar differences in older people, but those differences were attributed to earlier diagnosis in females. (*JAMA Dermatology*, August 2013)

Racial disparities found in older Americans on antidepressants — Ann Arbor VA researchers showed that older African American women are less likely than white women to take their prescribed antidepressants. Researchers followed nearly 200 people, all ages 60 and older. All were diagnosed with depression and recommended for antidepressant medication by their primary-care doctors. After four months, 44 percent of African American women were taking the medication, compared with 74 percent of white women. The gap was smaller between African American and white men. According to the Centers for Disease Control and Prevention, African Americans are more likely than whites to have depression. Other studies have shown that whites are more likely to be prescribed antidepressants and more likely to use them. (*American Journal of Geriatric Psychiatry*, October 2013)

VA research addresses the challenges posed by the health care needs of diverse populations and the disparities that arise in care delivery, access, quality, and outcomes. VA aims to understand the reasons for healthcare disparities, develop interventions to reduce them, and translate findings into practice. Studies address multiple ethnic and racial groups, as well as disparities due to income, age, sex, and other factors. System-level disparities are also investigated.

Facts about Health Care Disparities

- Health care disparities exist in a range of settings in the United States. They include disparities by race or ethnicity, age, income, sex, and other characteristics.
- Disparities have multiple origins, including but not limited to access barriers, communication issues, cultural factors, economics, genetics, and lifestyle factors. Research suggests that reducing these disparities will require not only improving equity within the health care system, but also extending beyond the system and into the communities where patients live and work.
- VA has traditionally been at the forefront of research in reducing disparities, and is uniquely suited for such study, given its integrated health care system that provides universal access for Veterans.



Hearing Loss

Recent Advances

Working toward tests for tinnitus — Tinnitus (ringing in the ears) is common in Veterans, but there are no objective tests to diagnose it. Researchers at the NCRAR conducted three phases of testing to try to distinguish Veterans with tinnitus from those without. They found some differences between the groups, but no single test or series of tests could reliably diagnose the condition. As many as 4 million Veterans have tinnitus, with 1 million seeking treatment for it. Future research may help researchers understand how to diagnose tinnitus, which also could lead to better treatments. (*Journal of Rehabilitation Research and Development, Vol. 50, No. 4, 2013*)

Group hearing-aid fittings effective, less costly — This study randomized 644 people to attend either group or individual visits for hearing aid fittings and follow-up. There were no differences in how well the hearing aids performed, or how often they were worn. However, group visits cost about half of what individual visits cost. Puget Sound (Wash.) VA researchers did note that those who had group visits were more likely to wish they had more one-on-one time with an audiologist. However, those who had group visits said they gained support and insight from other patients during the visits. Group results could reduce costs while providing community support for patients with hearing loss. (*Journal of Rehabilitation Research and Development, Vol. 50, No. 4, 2013*)

Frequency modulator helps with understanding speech — A recently completed study shows that frequency modulation (FM) may help Veterans who have normal hearing but problems understanding speech, due to mild traumatic brain injury. The study tested an FM system, which uses radio waves to transmit signals directly from a microphone to an earpiece to make a speaker's voice clearer. It also tested a "brain-training" computer program that has users follow instructions or interpret sounds. Preliminary results showed improved outcomes among those using FM. Researchers at NCRAR and the Tampa VA are continuing to analyze data. ("*Evaluation of approaches to auditory rehabilitation for mild traumatic brain injury*," www.ncrar.research.va.gov)

VA researchers are studying ways to prevent, diagnose, and treat hearing loss, addressing a wide range of technological, medical, rehabilitative, and social issues. Much of the work takes place at the National Center for Rehabilitative Auditory Research (NCRAR) in Portland, Ore.

(www.ncrar.research.va.gov).

Facts about Hearing Loss

- Hearing loss affects some 28 million Americans, including more than half of those over age 75.
- The most common cause of hearing loss is exposure to harmful levels of noise. Other possible causes include allergies, infections, drugs, and genetic factors.
- Some hearing loss can be reversed through surgery or medication. In other cases, hearing loss is permanent but can be reduced through the use of hearing aids. Though almost all people with hearing loss could be helped by hearing aids, only about one in five uses them.
- Increasingly, Veterans score normally on a hearing test but have difficulty understanding speech. This condition, called auditory processing disorder, often is associated with blast exposure.
- Noise-induced hearing loss and tinnitus are among the most common disabilities affecting Veterans.



Hepatitis C

Recent Advances

Interferon-alpha treatment failure may indicate risk for cirrhosis — People with hepatitis C who do not respond to treatment with interferon have a higher risk of cirrhosis than other patients, says a study from the San Francisco VA. The study included Veterans as well as patients at a university hospital. Those who failed interferon treatment had a higher cirrhosis risk than three other groups: those receiving no treatment, those who responded to interferon treatment, and those who responded but then relapsed. However, survival rates were the same for non-responders as for patients who received no treatment. Patients had been followed for 7 to 10 years. Cirrhosis is irreversible scarring of liver tissue. Common causes are hepatitis and alcoholism. (*PLoS One*, 2013)

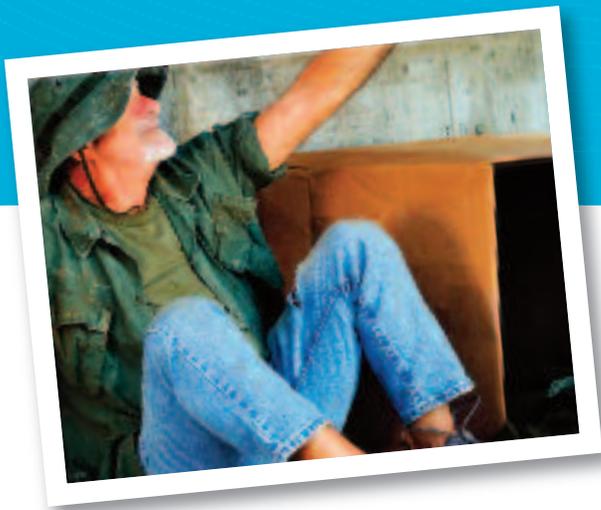
Treatment benefits patients with anemia — A study of 200,139 Veterans with hepatitis C showed that those with anemia benefit from treatment. Treatment reduced their risk of mortality by more than half. Generally, treatment is offered less frequently to people with anemia, because low red blood-cell count is a common side effect. However, given that treatment appears to improve survival, the authors suggest identifying and treating hepatitis C patients who have anemia. (*Clinical Gastroenterology and Hepatology*, June 2013)

Trial tests solution to overcoming treatment barriers — Most people with hepatitis C are not treated for it, often because of mental health issues or substance abuse. A multisite trial is under way to increase treatment rates among Veterans. The study has randomized 364 VA patients to either integrated care or usual care. Those receiving integrated care meet with a mental health provider, who addresses risk factors, consults with treatment providers, and manages care before and during treatment. The study will focus on treatment initiation and completion rates, as well as viral response to treatment. Researchers also will collect data on depression, substance use, PTSD symptoms, quality of life, and health care satisfaction. Each patient will be followed for 22 months. (*Contemporary Clinical Trials*, July 2013)

VA research on hepatitis C includes clinical trials of treatments, epidemiologic studies, investigations into the biological mechanisms of infection, and studies on removing barriers to treatment.

Facts about Hepatitis C

- Hepatitis C is caused by a virus. The disease is spread through contact with infected blood or contaminated IV needles, razors, tattoo tools, or other items.
- Hepatitis C is more common among Veterans than the general population. About five percent of Veterans treated in the VA health care system have hepatitis C, compared with two percent of non-Veterans.
- Most people with hepatitis C do not have any signs or symptoms of the disease for decades. By the time the disease is diagnosed, there can be significant damage to the liver, leading to complications such as cirrhosis and liver cancer, and sometimes resulting in death.
- Treatment can be effective, but the regimen is difficult. It can take a year of treatment before the body completely clears the virus, and the drugs to treat hepatitis C can cause fatigue, depression, anemia and skin rashes.



Homelessness

Recent Advances

Violence, trauma common among homeless—VA's National Center for PTSD published two recent studies that focused on trauma in homeless Veterans. In one study of 115 people, 82 percent had experienced interpersonal violence as adults, and 62 had experienced it as children. Also, 53 percent experienced highly stressful events during military service. Another study included more than 126,000 homeless Veterans who used VA health care in 2010. Of these, 40 percent of female Veterans and 3 percent of males had experienced sexual trauma while enlisted. These numbers are higher than those in the general Veteran population. A study by the New England VA Mental Illness, Research, Education and Clinical Center also found homelessness associated with childhood problems, such as abuse and family instability. (*Journal of General Internal Medicine*, July 2013; *Military Medicine*, September 2013; *Social Psychiatry and Psychiatric Epidemiology*, March 2013)

Dental care boosts success rates—Dental care ranks in the homeless Veteran's top three unmet needs, along with housing and child care. Several VA centers examined the impact of dental care on homeless Veterans discharged from a VA transitional housing intervention program. The study included 9,870 Veterans. Of these, 4,482 received dental care during the program. Compared with those not receiving dental care, they were 30 percent more likely to complete the program, 14 percent more likely to be employed or financially stable, and 15 percent more likely to have found residential housing. (*American Journal of Public Health*, online May 16, 2013)

Incarceration history no barrier to finding housing—There is concern that Veterans with a history of incarceration are at a particular disadvantage in exiting homelessness. However, a study by the New England VA Mental Illness, Research, Education and Clinical Center suggests incarceration is not a major barrier. Researchers studied 14,557 Veterans who were part of the Housing and Urban Development-Veterans Affairs Supportive Housing program. Overall, a history of incarceration, reported by about 65 percent of the Veterans, did not appear to affect progression through the program or the chances of obtaining housing. (*Community Mental Health Journal*, online June 1, 2013)

VA research on homelessness looks at causes, risks, and prevention, and helps develop interventions to improve health and provide resources and training. The National Call Center for Homeless Veterans (1-877-4AID-VET) is staffed by trained responders who provide support and resources to Veterans and their families who lack secure housing. In 2012, the center handled more than 80,000 calls.

Facts about Homelessness

- Veterans are at higher risk for homelessness than the general population. The risk of becoming homeless is particularly high in Veterans who live in poverty: about 10 percent of these Veterans are homeless in any given year.
- Since 2009, the number of homeless Veterans has dropped more than 17 percent. The federal government aims to end homelessness among Veterans by 2015 through the Homeless Veterans Outreach Initiative.
- VA and the Department of Housing and Urban Development jointly administer a program that provides permanent housing and ongoing case management.
- The National Center on Homelessness Among Veterans offers preventive services, housing support services, treatment resources, and job training.



Infectious Diseases

Recent Advances

Copper reduces hospital-acquired infections — Copper-alloy surfaces in intensive care units (ICUs) harbor fewer bacteria that cause hospital-acquired infections. Researchers from the Ralph A. Johnson VA Medical Center (Charleston, S.C.) did the study in association with the University of South Carolina and Memorial Sloan-Kettering Cancer Center, New York. The study involved 650 patients admitted to the ICU. They were randomly assigned to either a room with copper-alloy surfaces or one without. Six objects in each room were sampled weekly for bacteria. Patients were monitored for infections during hospitalization and for six months afterward. About 13 percent of people in non-copper rooms developed an infection or became colonized with infective bacteria, compared with 7 percent of those in copper-alloy rooms. This was a pilot study, and researchers suggest larger, follow-up studies. (*Infection Control and Hospital Epidemiology, May 2013*)

Potential new antimalarial drug — Researchers at the Portland VA have identified a new potential drug to fight malaria. ELQ-300 is highly active against malaria parasites in rodent models. It is predicted to need a low dose in patients, and has a long half-life. ELQ-300 targets both the liver stage and the blood stage of the malaria parasite. It is in a new class of antimalarial drugs called quinolone-3-diarylethers. (*Science Translational Medicine, March 20, 2013*)

Outpatient clinics one source of C diff — Clostridium difficile (C diff) infection can cause diarrhea and intestinal inflammation. The bacterium is common in long-term care facilities, and infection is often associated with taking antibiotics. C diff infections have become more severe and frequent in the past several years. Cleveland VA researchers followed 67 people diagnosed with C diff infections. Many had one or more outpatient visits during the 12 weeks after diagnosis. About one-third had C diff on their skin during an outpatient visit, and 27 percent spread C diff to surfaces in the outpatient clinic. Other studies have found that even four weeks after antibiotic treatment, half of C diff patients can still spread the bacteria. (*PLoS ONE, July 2013*)

One of the earliest contributions of VA researchers to medical science was the establishment of effective treatments for tuberculosis. Since then, VA scientists have helped advance the understanding, prevention, and treatment of numerous infectious diseases, ranging from the common cold to major public health threats, such as AIDS and influenza. Research also focuses on infectious diseases that may put U.S. troops abroad at risk, such as malaria and leishmaniasis.

Facts about Infectious Diseases

- Infectious diseases are generally classified according to the source of the infection. The major types are viral, bacterial, parasitic, and fungal.
- In the VA health care system, two viral diseases of special concern are HIV/AIDS and hepatitis C. VA maintains special websites devoted to these conditions: www.hiv.va.gov and www.hepatitis.va.gov.
- VA investigators are studying these and a range of other infectious diseases, working toward developing effective new preventive strategies, vaccines, and drugs.
- Hospital-acquired infections are an increasing concern, causing nearly 100,000 deaths every year in the U.S. and leading to some \$40 billion in health care costs.



Kidney Disease

Recent Advances

Drug works in kidney patients with heart failure — Enalapril reduces the risks of hospitalization and death in people with kidney disease who also have heart failure. The Studies of Left Ventricular Dysfunction (SOLVD) Trial, based at the Birmingham (Ala.) VA, included 2,569 heart failure patients. Of these patients, 1,036 had chronic kidney disease. All were randomized to receive enalapril or placebo. In kidney-disease patients, enalapril reduced the risk of hospitalization by 23 percent and the risk of death by 12 percent. In those without kidney disease, these risks were reduced by 20 percent and 18 percent, respectively. (*International Journal of Cardiology*, July 15, 2013)

Improving survival through depression treatment — Researchers at the VA North Texas Health Care System, Dallas, have started a randomized, placebo-controlled, double-blind trial of sertraline, an antidepressant. The trial will enroll 200 adults with kidney disease and major depression. The primary outcome is improvement in depression symptoms. One in five patients with kidney disease also has major depression. These patients are at increased risk for hospitalization and death. However, depression is still underdiagnosed and undertreated in kidney disease patients. (*Contemporary Clinical Trials*, January 2013)

Lowered enzyme activity linked with early kidney disease — Inducing the activity of the enzyme AMPK reverses kidney damage in the early stages of kidney disease, according to studies done in a rodent model at the San Diego VA and the University of California, San Diego. AMPK is normally protective of the kidneys. But in a commonly used rodent model, early kidney damage leads to reduced amounts of AMPK. When researchers upped the activity of AMPK, kidney function improved and kidney damage lessened. Restoring or inducing AMPK activity may be one way to treat kidney disease, the authors suggest. They note that their approach would be specific to kidney disease that does not result as a complication of diabetes. (*American Journal of Physiology – Renal Physiology*, September 2013)

VA has a comprehensive research portfolio aimed at preventing and improving the treatment of chronic kidney disease. There are many causes of chronic kidney disease, but the two main causes—accounting for up to two-thirds of cases—are diabetes and high blood pressure. Research on these related illnesses may also help reduce the prevalence of chronic kidney disease among Veterans.

Facts about Kidney Disease

- The kidneys are a pair of fist-sized organs located on either side of the spinal column. Kidneys perform life-sustaining functions that keep the rest of the body in balance.
- Early kidney disease has few symptoms. As it worsens, complications such as high blood pressure, arteriosclerosis, anemia, weak bones, and nerve damage can develop. If the disease progresses to kidney failure, dialysis or a kidney transplant is needed.
- About 10,000 Veterans are on dialysis. Each year, 3,200 Veterans are diagnosed with kidney failure.
- In partnership with the University of Michigan, VA established a registry in 2012 to help care for Veterans with kidney disease.



Mental Health

Recent Advances

Too much, too little sleep may indicate poor mental health — A study of OEF/OIF Veterans has found that those who sleep too much or too little are more apt to have depression or PTSD. Durham VA researchers studied 1,640 Veterans with an average age of 37. Those who slept five or fewer hours or nine or more hours were more likely to have major depressive disorder or PTSD. Assessing sleep problems may help clinicians identify and treat Veterans at risk for mental health issues. (*Sleep, July 2013*)

Most older Veterans resilient after traumas — Even when faced with multiple traumas, about 7 in 10 older Veterans are considered resilient, with low levels of psychological distress. A study from the West Haven (Conn.) VA included 2,025 Veterans age 60 and older. About 60 percent had low levels of lifetime trauma, and 40 percent had higher levels. Those with higher levels were more likely to be resilient if they had at least a college education and were married or partnered. Resilient Veterans also had strong social supports and fewer physical difficulties, felt integrated into their communities, and felt a sense of purpose in life. (*Depression and Anxiety, May 2013*)

Pain more common with mental-health conditions — Veterans with depression, schizophrenia, and bipolar disorder are more likely to also have pain, according to research from the Ann Arbor VA. The study analyzed treatment records from nearly 5.2 million Veterans who received VA care in 2008. Veterans with depression were 2 ½ times as likely to have pain. Those with bipolar disorder were about twice as likely, and those with schizophrenia had a 20 percent increased risk of pain. The most common types of pain were general chronic pain and headache. The researchers suggest further study on how pain might affect mental health treatment, as well as barriers to effective pain treatment in people with mental health conditions. (*General Hospital Psychiatry, Sept-Oct 2013*)

Major areas of focus for VA research on mental health include substance abuse, posttraumatic stress disorder, adjustment and anxiety disorders, depression, bipolar disorder, and schizophrenia. Researchers are seeking biomarkers for diagnosis and treatment, studying and testing new drug therapies, and improving access to mental health care through telehealth and other innovative approaches.

Facts about Mental Health

- Mental health conditions such as depression and anxiety are common in the United States, with more than a quarter of Americans suffering from a diagnosable mental disorder in any given year.
- Mental health is a major focus for VA's health care system. About 30 percent of Iraq and Afghanistan Veterans will be diagnosed with a mental health condition. PTSD and depression are common, with about 18.5 percent of these Veterans having at least one of these diagnoses.
- In addition to deployment-related mental health problems, schizophrenia is a major focus of VA clinical care and research, affecting some 100,000 VA patients and accounting for nearly 12 percent of VA's total health care costs.



Obesity

Recent Advances

Videoconferencing as an aid to weight management — VA researchers in Sioux Falls, S.D., studied the weight-loss outcomes among 120 Veterans, half of whom took part in a series of 12 weekly MOVE! classes delivered via videoconferencing. The MOVE! participants lost weight while the control group—which took part in no video or in-person classes—gained weight. The average weight difference between the groups was about 12 pounds. The weight loss was sustained among the MOVE! participants at one year after the initial baseline measurements. The authors say videoconferencing shows great promise as a way to deliver VA's successful MOVE! program, especially for Veterans who live in remote areas or otherwise can't make it to VA sites where the program is offered. (*Journal of Rural Health, online Sept. 24, 2013*)

Weight loss reduces reflux — Weight loss can reduce or eliminate the symptoms of gastroesophageal reflux disease (GERD), according to a study from the Kansas City (Mo.) VAMC. Researchers enrolled 332 people in a six-month weight-loss program. The average weight at the start of the study was 222 pounds. After six months, it had dropped to about 193 pounds. The percentage of people with GERD symptoms dropped from 37 percent to 15 percent. More than 80 percent of people had at least some improvement in GERD symptoms, if not complete resolution. (*Obesity, February 2013*)

Gastric banding helps type 2 diabetes — A two-year study found that gastric banding nearly always improves or eliminates diabetes symptoms. San Diego VAMC researchers followed 66 people with type 2 diabetes who had gastric banding, a type of obesity surgery. Before the banding, all required daily medication for their diabetes. After two years, 48.5 percent had no symptoms of diabetes. Another 47 percent had improvement of symptoms. Only 4.5 percent had no change in their diabetes status. People with no change were more likely to have had diabetes for a longer time period before the procedure. They were also likely to have lost less weight over the two-year time period. (*Postgraduate Medicine, November 2012*)

VA research on obesity examines the biological mechanisms of weight gain and weight loss; compares the safety and effectiveness of obesity treatments; and aims to identify strategies to prevent weight gain through exercise and healthy eating. These efforts complement VA's "MOVE!" program, a national weight-management and exercise program designed and coordinated by the VA National Center for Health Promotion and Disease Prevention.

Facts about Obesity

- Obesity is defined as a body mass index (BMI) of 30 or greater, while overweight is defined as a BMI of 25–29.9.
- More than 35 percent of American adults are obese. About 17 percent of children are obese. That translates to more than 78 million adults and 12.5 million children.
- The cost of obesity in the United States is estimated at \$147 billion per year.
- Obesity is a risk factor for heart disease, diabetes, stroke, and some types of cancer.
- More than 7 in 10 Veterans who receive VA care are either overweight or obese.



Pain Management

Recent Advances

Walking for pain relief — Online information and social support may help Veterans stick with a walking program, at least in the short term. A study at the Ann Arbor VA included 229 Veterans with chronic back pain. All received a pedometer and could upload its data to a computer. About half also had access to a website that provided automated walking goals, feedback, motivational messages, and social support. After six months, this group reported significantly less back pain than the pedometer-only group. However, after 12 months, there were no differences between the groups. The authors suggest further interventions might help to support improvement beyond six months. (*Journal of Medical Internet Research*, August 2013)

SCOPE: Optimizing pain management — The Indianapolis VA recently began the Stepped Care to Optimize Pain care Effectiveness (SCOPE) study, a randomized clinical trial in five primary care clinics. Started in 2009, the study includes 250 Veterans with persistent musculoskeletal pain. They are randomized to usual care or stepped care. Stepped care combines automated symptom monitoring with a telephone-based, pain specialist team to treat pain. Veterans will be assessed at the start of the study and after 1, 3, 6, and 12 months. SCOPE aims to overcome common barriers to effective pain treatment, which include inadequate initial treatment, failure to monitor adherence and symptom response, and failure to adjust treatment over time. (*Contemporary Clinical Trials*, March 2013)

Vitamin D supplements improve pain, sleep — Vitamin D supplements reduce pain and improve sleep, according to a small study from the Atlanta VA. Twenty-eight Veterans were enrolled in the study. All had multiple areas of chronic pain, as well as low blood vitamin D levels (<30 ng/ml). They took vitamin D supplements for over a year. Their pain decreased, sleep time and quality increased, and general health and social functioning increased. Vitamin D is a fat-soluble vitamin that supports the body's absorption of calcium and phosphorus. It is crucial for bone growth, cell growth, and immune system strength. (*Clinical Journal of Pain*, April 2013)

VA is working to develop new approaches to alleviate Veterans' pain, which may result from spinal cord injury, burns, amputations, traumatic brain injury, cancer, arthritis, or other conditions.

VA's research portfolio in this area covers a wide range of topics, from drug discovery to alternative treatments, such as yoga or massage.

VA investigators are also leaders in studying the impact of pain on daily function and quality of life.

Facts about Pain

- Pain is one of the most common reasons people consult a physician and is cited as the most common symptom in service members returning from combat.
- About half of VA patients are diagnosed with at least one type of chronic pain.
- Some types of chronic pain, such as the nerve pain experienced by many people with spinal cord injury, are notoriously difficult to treat.
- VA's Chronic Pain Rehabilitation Program, established in 1988, is a nationally known center for chronic pain research, treatment, and education (www.tampa.va.gov/chronicpain).



Parkinson's Disease

Recent Advances

Deep-brain stimulation does not increase risk of suicide — Questions have been raised about suicide risk in people undergoing deep-brain stimulation (DBS) for advanced Parkinson's disease. At least one study has found an increased risk. Philadelphia VA researchers randomized 255 Parkinson's patients to either DBS or medical (drug) therapy. A second phase of the study randomized 299 patients to one of two types of DBS. In the first part of the study, no suicide or attempts were reported, and new thoughts of suicide were rare (1 to 2 percent of patients) and not more common in the DBS group. In the second phase, thoughts of suicide were also rare, and not different between DBS groups. (*Journal of Neurology, Neurosurgery, and Psychiatry*, October 2013)

APOE E4 linked with dementia — The E4 variant of the apolipoprotein-E (APOE) gene has been linked with Parkinson's in previous studies. It also is linked with Alzheimer's. Now, research from the Puget Sound (Wash.) VA has found that APOE E4 is more common in people with dementia who have Parkinson's, Alzheimer's, or Lewy body disease, another neurodegenerative disorder that causes dementia. In genetic studies of donated brain tissue, APOE E4 was found in 7 percent of people without dementia. It was found far more often in Alzheimer's patients with and without Lewy body disease, people with only Lewy body disease, and patients with Parkinson's. (*JAMA Neurology*, February 2013)

'Forced' exercise may not help Parkinson's symptoms — "Forcing" patients to exercise using a motorized stationary bike does not appear to improve Parkinson's symptoms. A small study by the Richmond VA assigned 13 patients to exercise and 10 patients to usual care. The exercise group used a stationary bicycle twice a week for eight weeks. The bike had motorized pedals that could be programmed to a set speed to allow users to move their legs without effort. Researchers found no differences in symptoms. Past studies have found benefits to "forcing" Parkinson's patients to exercise. Those studies used tandem bicycles, with the patient in the back seat. (*Rehabilitation Research and Practice*, 2013)

VA has six Centers of Excellence focused on Parkinson's disease, based in Houston, Philadelphia, Portland, Richmond, San Francisco, and Los Angeles (www.parkinsons.va.gov). Researchers at these sites are studying the biochemical pathways involving dopamine—a brain chemical implicated in Parkinson's disease—and testing a variety of treatment approaches, including medication, surgery, and electrical stimulation. Biomedical and clinical studies on Parkinson's disease are ongoing at many other VA sites, as well.

Facts about Parkinson's Disease

- Parkinson's disease is a disorder of the central nervous system, characterized by the death of dopamine-producing cells in the brain.
- The disease causes a variety of "motor" (related to movement of the muscles) symptoms: rigidity of the muscles, delayed movement, poor balance, tremors.
- Non-motor symptoms of Parkinson's include sleep disturbances, urinary dysfunction, constipation, swallowing problems, mood disorders, and cognitive deficits.
- Parkinson's affects as many as 1.5 million Americans, mostly people over age 50. About 80,000 Veterans have the condition.



Personalized Medicine

Recent Advances

Gene variation boosts response to clopidogrel — Clopidogrel (sold as Plavix) is a common blood thinner that is prescribed to prevent stroke and second heart attacks. Researchers from the Baltimore VA have found that variations in the CES1 gene reflect how well a person breaks down and uses clopidogrel. They studied DNA from 916 people taking the drug. Those who carried a gene variation called CES1-143E had higher levels of metabolized clopidogrel in their bloodstreams. These people also had blood that clotted less easily, showing that the drug was doing its job. Other gene variations have been shown to affect response to clopidogrel, but this is the first study to focus on CES1-143E. Only 1 percent to 2 percent of people carry this gene variation. This information may be used in the future to better personalize treatment after a heart attack. (*Pharmacogenetics and Genomics*, January 2013)

Personalizing medicine choice in COPD patients — Chronic obstructive pulmonary disease (COPD) increases the risk of heart failure. So does high blood pressure. In Veterans with both of these conditions, which medicines are best for lowering blood pressure? Researchers at the Puget Sound VA compared several two-drug combinations prescribed to 7,104 Veterans between 2001 and 2006. They found that in patients without existing heart failure, treatment that included a thiazide diuretic was most effective. In patients with heart failure, no two-drug combination was more effective than another. (*Chest*, May 2013)

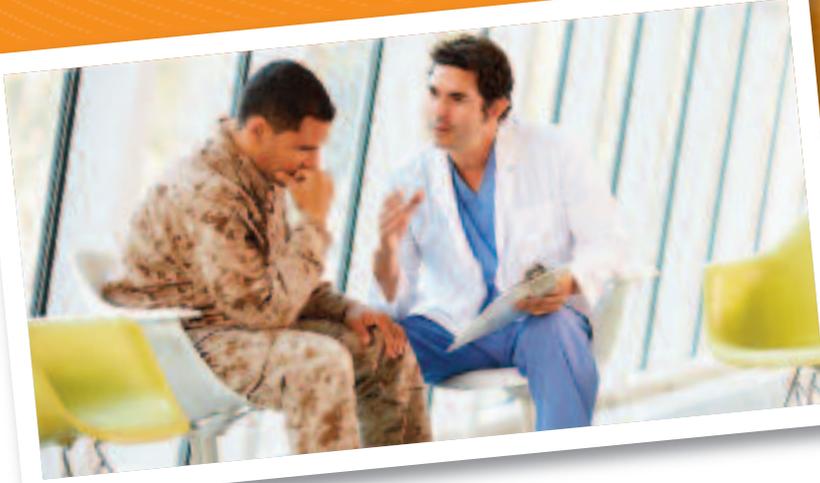
Gene linked to reduced risk of stroke — VA researchers in Baltimore looked at variations in a gene called ATP1A2 that might affect the risk of stroke. One variation, rs2070704, was linked with a 26 percent lower risk of stroke. When researchers focused on ethnicity, they found the lower risk only in African Americans, and saw a stronger association in African American males than in females. Changes in ATP1A2 have been linked with a type of migraine. However, the Baltimore researchers did not find any links among migraine, stroke risk, and ATP1A2. (*Springerplus*, 2013)

VA is working to develop safer, more effective treatments based on new knowledge about the role of genes in health and disease. The goal is to provide medical care that is personalized to the genetic makeup of individual Veterans.

In early 2011, VA launched the Million Veteran Program (www.research.va.gov/mvp), a major initiative that aims to build one of the world's largest databases of genetic, military exposure, lifestyle, and health information.

Facts about Personalized Medicine

- With the completion of the Human Genome Project and other gene-mapping efforts, researchers have a detailed map of humans' genetic structure. Research is now focused on learning more about the role of specific genes, how they interact, and what activates or deactivates them.
- A common method of investigation is the "genome wide association study," or GWAS, in which scientists scan and analyze DNA from huge numbers of research volunteers to tease out which genes or genetic variations are linked to particular diseases or health traits.



Posttraumatic Stress Disorder

Recent Advances

Brain protein linked with PTSD, hypervigilance — Lower levels of the norepinephrine transporter (NET) protein are found in people with PTSD, but not healthy controls, according to a study by VA researchers in Connecticut. They used positron emission tomography (PET) scans to look at the availability of NET in a part of the brain called the locus coeruleus, which is involved with the body's response to stress. They scanned healthy adults, adults exposed to trauma who did not develop PTSD, and adults exposed to trauma who developed PTSD. The PTSD group had 41 percent lower availability of NET in this area of the brain than healthy adults did. There was no significant difference between the two trauma-exposed groups, however. In the PTSD group, people with greater NET availability had more severe hypervigilance symptoms. (*JAMA Psychiatry*, online Nov. 1, 2013)

Family stress increases PTSD risk for those exposed to combat — Life and family stress during deployment can increase the risk for PTSD by up to nine times in Veterans who were exposed to combat, says a study from the Providence (R.I.) VA. The research included 238 National Guard/Reserves members who completed surveys about four months post-deployment. PTSD was linked with higher levels of combat exposure and life and family concerns, and lower levels of post-deployment social support. Three percent of Veterans with high combat exposure but low family concerns had PTSD, compared with 27 percent of Veterans with high combat exposure and high levels of family concerns. (*Psychiatry Research*, online Dec. 30, 2013)

Telemedicine treatment effective, less costly — Using videoconferencing to provide psychotherapy to Veterans in remote locations is less costly than in-person treatment. A study from the Honolulu VA previously showed that videoconferences were just as effective as in-person therapy. The same group found that videoconferencing had lower total costs, compared with in-person therapy. Videoconferencing expands the reach of PTSD treatment to Veterans who live in geographically isolated or remote areas, from which it may be difficult to access face-to-face counseling services. (*Telemedicine Journal and E-health*, October 2013)

VA supports numerous studies aimed at understanding, treating, and preventing posttraumatic stress disorder (PTSD). These studies range from investigations of the genetic or biochemical underpinnings of the disease to evaluations of new or existing treatments, including large clinical trials. Much of the work is conducted in collaboration with the Department of Defense, and involves Veterans as well as active duty Service members.

Facts about PTSD

- PTSD affects many people who experienced life-threatening events, such as combat, terrorist attacks, or personal assaults.
- Symptoms include flashbacks, nightmares, depression, and social withdrawal, as well as physical health changes.
- Treatment often includes anti-anxiety drugs or other medications, along with counseling therapy.
- As many as 20 percent of Iraq/Afghanistan Veterans are thought to have PTSD. This compares with about 10 percent of Gulf War Veterans and 30 percent of Vietnam Veterans.
- Overall, about 5.2 percent of adults will have PTSD in a given year. Women are about twice as likely as men to develop it.



Prosthetics/Limb Loss

Recent Advances

Look to the squid — A team at the Cleveland VA has created a prosthetic material inspired by a squid's beak. The material transitions from hard to soft, making it ideal for use in prosthetics. Attaching rigid artificial limbs to soft skin can cause discomfort, sores, and tissue damage. The team created the material using cellulose scaffolding. Its stiffness depends on how long it is exposed to ultraviolet light. The material also could be used in other biomedical settings, such as implanted blood-sugar monitors, chemotherapy ports, and electrodes. (*Journal of the American Chemical Society*, online March 26, 2013)

Leg muscles can “learn” to control prosthetics — Researchers at the Ann Arbor VA have shown that people with lower-limb loss can use signals from their remaining limb muscles to control robotic prosthetics. Previous studies had shown the promise of the technique in upper limbs, but not lower ones. Researchers asked volunteers to control an object on a computer screen using a muscle on the front of the lower leg. Half of the volunteers had no limb loss. The other half had lost part of a lower leg, either due to trauma or vascular problems. Initially, the limb-loss group had poorer control. But after 20 attempts over a one-hour period, there were no differences between groups. This was the case even in volunteers who had lost a limb more than 15 years previously. (*Journal of Rehabilitation Research and Development*, Vol. 50, No. 5, 2013)

Statin use lowers risk for limb loss — People with diabetes who take statins have a reduced risk of lower-limb amputations, says a study from the Hines VA (Ill.). The study included 83,953 patients, followed from 2004 to 2008. During that time, 217 needed a lower-limb amputation, and about another 11,500 died. People who took statins were 35 percent less likely to experience an amputation, and 43 percent less likely to die. Other cholesterol-lowering medications appeared to reduce the risk of death by a similar amount, but did not reduce the risk of amputation. (*Journal of Vascular Surgery*, online Aug. 7, 2013)

VA has long been a world leader in prosthetics research and care, and is now in the forefront of developing and testing innovative prosthetic devices, such as the DEKA Arm, that take advantage of the latest advances in computer and robotics technology. VA researchers are also studying the best ways to match existing prosthetic devices to the needs of those with limb loss, and testing new approaches to prevent non-traumatic amputation and heal injured extremities.

Facts about Prosthetics and Limb Loss

- More than 1,700 OEF/OIF Service men and women suffered limb loss between 2001 and 2012. Many of these men and women are now in care in the VA system, along with Veterans of previous eras who suffered limb loss.
- Aside from combat injuries, complications of diabetes are another major cause of amputations: In the U.S., people with diabetes account for about two-thirds of all lower-limb amputations.
- Some of the nation's leading work on prosthetics and limb loss takes place at centers of excellence funded by VA's Rehabilitation Research and Development Service.



Spinal Cord Injury

Recent Advances

Neuroprosthetics trial nearing end — A 10-year trial, set to end in 2015, is testing a surgically implanted electrical stimulation system in people with SCI. During the surgery, electrodes are implanted in muscles of the trunk and legs and leads are connected to a stimulator/telemeter. By stimulating muscles, the system activates muscles to allow for standing, better balance, and exercise. Patients are given functional training and rehabilitation using the stimulation system, and are prescribed a course of exercise. Lab tests focus on strength, balance, and abilities with and without the system. A preliminary study found improved quality of life in patients using the system. The trial is taking place at the Louis Stokes Cleveland VAMC and MetroHealth System, Cleveland. It is sponsored by VA, Case Western Reserve University, and the National Institutes of Health. (*ClinicalTrials.gov*; *Journal of Rehabilitation Research and Development*, Vol. 49, No. 2, 2012)

Employment support — VA researchers in Tampa and five other cities are studying a program called Individualized Placement and Support (IPS), designed to help Veterans with SCI get back into the workforce. The program uses a team approach that includes vocational rehabilitation specialists working alongside clinical care providers. More than 1,000 Veterans with SCI will be part of the trial, about a fifth of whom will be IPS participants; the others will receive usual care. Researchers will compare outcomes across both groups, with the main goal being long-term, stable, competitive employment. (*VA Research Currents*, August 2013)

ReWalk ‘exoskeleton’ allows for standing, walking — Researchers at the Bronx VA are evaluating Israeli technology that allows paraplegics to stand, walk, and climb stairs. Nine participants have tested the ReWalk, which involves special shoes, leg braces, a watch-like control pad, and a battery-filled backpack. On their first day using ReWalk, most people can stand and take a few steps. People in the study have lost fat tissue, had improved bowel function and reduced diabetes symptoms. One study participant has begun to regain feeling in his legs. The \$60,000 unit is under review by the Food and Drug Administration. (*Bronx VA Medical Center media advisory*, March 2013)

VA researchers are studying the biological processes involved in spinal cord injury (SCI), and working to develop better treatments and adaptive technologies. They are also addressing SCI complications such as respiratory problems, pressure ulcers, digestive complications, and circulatory problems.

Facts about Spinal Cord Injury

- Spinal cord injuries impair the brain's ability to send messages to the rest of the body. These injuries can result in paralysis, loss of feeling, chronic pain, and other serious medical problems.
- Spinal cord injuries are estimated to affect as many as 332,000 Americans, with about 12,000 new injuries occurring each year. About 81 percent of people with these injuries are male.
- Nearly half of all injuries occur in people between the ages of 16 and 30, so many patients live with the effects of these injuries for decades.
- VA treats more than 26,000 people with spinal cord injuries and disorders each year, making it the largest integrated health care system in the world providing spinal cord care.



Substance Use Disorders

Recent Advances

Primary care treatment is effective — A 26-week primary care intervention is just as effective as specialty outpatient treatment for alcohol dependence, says a study. The Philadelphia VA study enrolled 163 Veterans and randomly assigned them to primary care treatment or specialty treatment. The primary care treatment used medicine and psychosocial support. It was delivered in person or by phone. Veterans in the primary care treatment were more than five times as likely as those in specialty treatment to complete all 26 weeks. Overall abstinence rates were the same between groups, and the primary care group had a smaller percentage of days with heavy drinking. Primary care treatment for alcohol dependence may be accessible to a larger percentage of people than specialty treatment. (*Journal of General Internal Medicine*, online Sept. 20, 2013)

Vaccine for meth addiction — A vaccine for methamphetamine addiction is effective and safe in a mouse model. Researchers at the Houston VA gave mice three doses of the vaccine. Four weeks after the second dose, vaccinated and non-vaccinated mice were tested with different methamphetamine amounts. Non-vaccinated mice showed changes in their movement patterns that could be attributed to meth addiction. Vaccinated mice showed much less of an effect. They also did not develop a positive conditioned response to receiving methamphetamine, whereas non-vaccinated mice did become conditioned. (*Drug and Alcohol Dependence*, April 2013)

Gene linked with cannabis dependence — A study from the New Haven (Conn.) VA has identified a gene variant that is linked with cannabis dependence in African Americans. The researchers used a genome-wide association study, or GWAS, to analyze DNA from 384 African American families and 354 European American families. On the NRG1 gene, researchers found one area—rs17664708—that was linked with cannabis dependence in both groups. The link was stronger in African Americans, and the researchers replicated the results in another group of African American study volunteers. They could not replicate the results in European Americans. African Americans who had rs17664708 were nearly three times as likely to exhibit cannabis dependence. (*Biological Psychiatry*, October 2012)

A leader in the field of addiction research for decades, VA continues to support a broad portfolio examining substance abuse prevention, screening and treatment, including studies aimed at understanding the genetic factors that may predispose people to alcohol or drug abuse and addiction.

Facts about Substance Use Disorders

- Substance use disorders include dependencies on alcohol, illicit and prescription drugs, and nicotine. They are considered by many to be the nation's leading health problem.
- In 2010, more than 465,000 Veterans were diagnosed with a substance use disorder. Of those, 28 percent also had posttraumatic stress disorder.
- About 1 in 4 deployed personnel have alcohol-related behavior problems, such as binge drinking. About 1 in 8 non-deployed personnel have such problems.
- Due in part to aggressive efforts by VA in the area of smoking cessation, fewer Veterans in the VA system are smoking today than a decade ago. In 1999, the prevalence of smoking among Veterans in VA care was 33 percent, and in 2008, it was just under 20 percent—about the same as for U.S. adults in general.



Suicide Prevention

Recent Advances

Exercise reduces suicide risk — A study of Veterans showed that regular exercise reduced the risk of suicide. The study, by VA researchers in Denver, Palo Alto, and Philadelphia, also showed that exercise improved sleep patterns and reduced the symptoms of depression. (*Suicide and Life-Threatening Behavior*, June 2013)

Brain changes linked with suicidal behavior — Veterans with traumatic brain injury (TBI) and suicidal behaviors have a larger thalamus, compared with Veterans with TBI but no suicidal behaviors. Researchers from the George E. Whalen VAMC (Utah) compared three groups of Veterans: 40 healthy, 19 with TBI and suicidal behaviors, and 15 with TBI and no suicidal behaviors. Both lobes of the thalamus were larger in Veterans with TBI and suicidal behaviors, compared with other Veterans in the study. The thalamus, which relays signals within the brain, is important in regulating sleep and has also been implicated in depression. (*Frontiers in Psychiatry*, Aug. 12, 2013)

Warning signs of suicide — Veterans who commit suicide within a week of receiving health care often exhibit warning signs, says a study by the Canandaigua (N.Y.) VAMC. At their final health care visit, such Veterans are more than three times as likely as other Veterans to have talked about committing suicide, or mentioned they have thought about it. They also are more than twice as likely to have shown psychotic symptoms, such as disorganized thoughts, unfounded fears, and hallucinations. Identifying these warning signs during a Veteran's health care visit may help to reduce the risk of suicide. (*Psychiatry Research*, December 2012)

It's about trust — VA researchers in Portland conducted follow-up interviews with Veterans who had shown evidence of suicidal thinking during risk assessments. They identified four key themes: the importance of the relationship between the Veteran and the clinician doing the assessment; the value of empathy and genuineness on the part of the clinician; the need for clear, direct language; and the importance of providing full information about the assessment process. (*Journal of General Internal Medicine*, September 2013)

VA investigators are exploring risk factors for suicide in Veterans and helping to improve risk assessments. They are also working to develop effective interventions and identify crucial time periods at which to intervene. Two VA centers are dedicated to research in this area: the Center of Excellence for Suicide Prevention in Canandaigua, N.Y., and the Mental Illness Research Education and Clinical Center in Denver. In addition, VA is part of a consortium set up by the Army to mesh military and civilian efforts in this area.

Facts about Suicide Prevention

- More than 30,000 Americans die each year from suicide; about 20 percent are Veterans.
- Veteran-specific risks include multiple deployments, exposure to combat/death, lengthy deployment, deployment to hostile areas, service-related injuries, and physical or sexual assault while serving.
- Evidence suggests that since 2006, younger Veterans (ages 18-29) who use VA health care are less likely to commit suicide, compared with those who do not.
- VA provides a suicide prevention hotline, 1-800-273-TALK. This has rescued more than 20,000 actively suicidal Veterans.



Traumatic Brain Injury

Recent Advances

The risk of chronic traumatic encephalopathy after TBI — Chronic traumatic encephalopathy is a degenerative brain disease that occurs after repetitive TBI. Researchers from the Boston VA analyzed brain tissue from 85 people with histories of repetitive mild TBI. They found evidence of chronic traumatic encephalopathy in 68 of them. Of those studied, 64 were athletes and 21 were Veterans, although 86 percent of the Veterans also were athletes. (*Brain*, January 2013)

Molecules may be useful for prevention, treatment — Two proteins may help treat or prevent traumatic brain injury, according to research from the San Francisco VA. One study compared TBI effects in mice with and without the gene for Hsp70. This protein is one of a family of proteins that helps to protect cells from stress. Mice that produced Hsp70 had smaller brain lesions, less bleeding in the brain, and fewer TBI symptoms. Another study found that a molecule called LM11A-31 protects TBI-damaged nerve cells and reverses impairments in spatial memory. Both molecules may develop into treatments for TBI-related injuries and symptoms. (*Neurobiology of Disease*, October 2013; *Stem Cells*, November, 2013)

Stroke risk increases in brain-injury patients — A study at the Ann Arbor VA found a slightly increased risk for stroke in TBI patients. This study included data on everyone who visited a California emergency department or was hospitalized in California for TBI or non-TBI trauma from 2005 to 2009. This totaled more than 1 million people. Of these, 37 percent had TBI. People with TBI were slightly younger, more likely to be male, and had more severe injuries. Over about 28 months, 1.1 percent of the TBI group had a stroke, compared with 0.9 percent of the non-TBI group. Because TBI can cause bleeding in the brain, it may increase the risk for stroke. Or there may be other factors involved. This large study suggests that TBI patients and their clinicians need to be aware of the risk. (*Neurology*, July 2, 2013)

VA researchers are conducting cutting-edge research aimed at improving care for Veterans with traumatic brain injury (TBI). VA research in this area focuses on gaining a better understanding of the brain changes that occur in TBI, refining screening and diagnostic tools, developing and evaluating treatments, and identifying coping strategies for Veterans and their families.

Facts about Traumatic Brain Injury

- Most TBI injuries are considered mild, but even these cases can involve serious long-term effects on areas such as thinking ability, memory, mood, and focus. Symptoms may also include headaches, vision, and hearing problems.
- TBIs can occur from direct contact to the head, or when the brain is shaken within the skull, such as from a blast or whiplash during a car accident.
- A recent survey of OEF/OIF troops found that 11 percent of women and 20 percent of men screened positive for deployment-related TBI.
- Treatment typically includes a mix of cognitive, physical, speech, and occupational therapy, along with medication to control specific symptoms, such as headaches or anxiety.



Vision Loss

Recent Advances

Vision problems under-diagnosed in Veterans with TBI — An ongoing study is finding a high rate of vision problems in Veterans with traumatic brain injury (TBI). Researchers from the Palo Alto VA are collecting data through 2015 on Veterans with any form of TBI. A preliminary study on 50 Veterans with blast-related TBI found that more than 65 percent had vision problems, and 77 percent reported sensitivity to light. Other difficulties included problems with eye movement, blurred vision, and problems focusing. (*Optometry and Vision Science, February 2013*)

Artificial retina could restore sight — A group at the Pittsburgh VA and Carnegie Mellon University is developing a prosthetic retina. The work involves a plastic film the width of an eyelash, which is inserted behind the retina. From the film, flexible electrodes send signals to retinal nerves. The signals are generated by a microchip attached to the eye. Input comes from special eyeglasses. The camera-like device is being tested in clinical studies. The work builds on VA-funded research from the Boston Retinal Implant Project. (*Carnegie Mellon news release, June 8, 2012*)

Telemedicine for high blood pressure also saves vision — The Durham VA-based Hypertension Intervention Nurse Telemedicine Study looked at the effects of telephone-based medication management and behavioral management on high blood pressure in people with diabetes. A follow-up analysis found that patients whose blood pressure improved due to the intervention also had about half the risk of worsening diabetic retinopathy, compared with those receiving usual care. Diabetic retinopathy damages the retina and eventually can lead to blindness. (*JAMA Ophthalmology, July 2013*)

Detecting the progression of eye disease — A research group at the Iowa City VA has found new medical applications for a decades-old statistical method used in quality control to detect small changes that require corrective action. The method is known as CUSUM (cumulative sum control chart). In a study involving 53 healthy patients and 103 patients with glaucoma, the researchers found CUSUM charts to be an effective aid in catching clinically significant changes in vision. (*Translational Vision Science and Technology, September 2013*)

VA researchers are designing new assistive devices for the visually impaired and improving existing ones. They are also exploring the use of GPS and other technologies—such as infrared signals or computer vision—to aid indoor and outdoor navigation for blinded Veterans. Other areas of investigation include the development of an artificial retina to restore vision, and the design and evaluation of new tests and therapy techniques to address vision problems associated with traumatic brain injury and posttraumatic stress disorder.

Facts about Vision Loss

- About 160,000 Veterans in the United States are legally blind, and about 285,000 have glaucoma.
- As many as 1.5 million Veterans have vision problems that affect their daily activities. Many are helped through VA's network of Low Vision Rehabilitation programs.
- Vision loss will become more common as more Korean- and Vietnam-era Veterans incur vision loss due to age-related diseases.
- Among the newest war Veterans, many who have suffered brain injuries from blasts also experience symptoms such as blurred vision, double vision, sensitivity to light, and difficulty reading.



Women's Health

Recent Advances

Heart-disease risk factors common — Women Veterans ages 35 to 64 are likely to have at least one modifiable risk factor for heart disease, says a study from the VA medical center in Bedford, Mass. Researchers used data on nearly 256,000 female Veterans. Among the youngest age group (35 to 44), 14 percent had high blood pressure, and a similar percentage had high cholesterol. Four percent had diabetes, and 14 percent were obese. Risk factors increased with age. Heart disease is the leading cause of death in U.S. women. (*Journal of General Internal Medicine, July 2013*)

1 in 8 female Veterans has PTSD — Among a nationwide representative sample of 3,611 female Veterans, 13 percent screened positive for posttraumatic stress disorder. About 43 percent of the women in the study used VA health care. Although overall fewer than half the women used mental health services, those receiving care through VA were nearly three times more likely to do so. The authors note that non-VA health care providers are less likely to be aware of women's Veteran status or their risk for PTSD. (*Journal of General Internal Medicine, July 2013*)

New biomarker for hip fracture risk — A VA team in Minneapolis identified a blood protein that may predict hip fracture risk in older women. Researchers studied 1,470 older women: 300 with hip fractures and 1,170 without. All had been examined in the recent past, and blood samples were taken at that time. The blood was checked for levels of cystatin C and creatinine. Both proteins are used as markers of kidney function: higher levels mean worsening kidney function. This study found that higher cystatin C levels were also associated with an increased risk of hip fracture. Women with the highest levels were nearly twice as likely to have broken a hip, compared with those who had the lowest levels. Creatinine levels were not linked with hip fracture risk. The cystatin C relationship with hip fracture was independent of all other known risk factors, including bone mineral density. (*Journal of Bone Mineral Research, June 2013*)

Women are the fastest-growing group of Veterans. In the past 25 years, the percentage of Veterans who are women has more than doubled, to about 10 percent. In response, VA has focused additional attention on the unique or special health needs of this population.

Research aims to improve primary and reproductive health care for women, and to help address the needs of special populations, such as aging female Veterans and those with mental health conditions.

Many diseases common among women—such as cancer, osteoporosis, arthritis, and depression—are the focus of biomedical studies and clinical trials at numerous VA sites.

Facts about Women's Health

- About half of female Veterans are married, and about half of those who are married are in dual-military marriages. About 11 percent of female Veterans are single mothers.
- Among female Veterans seen in VA, about 1 in 5 reports having experienced military sexual trauma.
- Among women treated by VA in 2009 and 2010, the top three diagnoses were PTSD, high blood pressure, and depression.

VA



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