



# Research Advances

A biennial publication highlighting recent accomplishments by VA investigators

2015 – 2016



**VA**



**U.S. Department of Veterans Affairs**

Veterans Health Administration  
*Office of Research and Development*



# Foreword

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**For 90 years,** VA Research 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 at [www.research.va.gov/topics](http://www.research.va.gov/topics) to view the Web version, which contains links to all the references cited.



# 2014 Highlights

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- Reported on new prosthetics technology to help **restore the sense of touch** for those who have lost an upper limb and use an artificial hand.
- Published extensive study findings on the implementation of VA's new model of primary care, **Patient Aligned Care Teams**.
- Published the first report from a new DoD-funded trial, led by a VA investigator and involving Vietnam Veterans, on the effects of **traumatic brain injury and posttraumatic stress disorder** on Alzheimer's disease risk.
- Announced funding of a new multisite **clinical trial** (VA Cooperative Study 592) on the safety and efficacy of implantable cardiac defibrillators.
- Launched phase 2 of the **Women Veterans Cohort Study**, looking at data on more than 900,000 Veterans to better understand women's health needs, health care use, and outcomes.
- Introduced "**Concussion Coach**," a mobile phone app for Veterans and others who have suffered a mild or moderate traumatic brain injury.
- Joined with NIH in funding **13 new research projects** aimed at developing nondrug approaches to manage pain and related conditions such as PTSD, drug abuse, and sleep difficulty.
- Won a Service to America medal (**Drs. Bauman and Spungen**) for innovative work on spinal cord injury.
- Continued to publish research findings on the advanced **DEKA prosthetic arm**, which won FDA approval in May 2014.
- Found, in a large VA cooperative study, that vitamin E can significantly **delay functional decline** among those with mild to moderate Alzheimer's disease.
- Launched a VA cooperative study on **lithium and suicide prevention**.
- Showed that a test that looks for blood and DNA mutations in stool is highly accurate for detecting **colorectal cancer**. The test was approved by the FDA in August 2014.
- Found that **food insecurity** affects more than 1 in 4 Iraq and Afghanistan Veterans.
- Determined, in a study of more than 16,000 births, that PTSD increases the risk of **preterm birth**.
- Reported on an **experimental drug** that appears to exert multiple actions against Alzheimer's disease.
- Found that Veterans diagnosed with traumatic brain injury may be at greater risk for **dementia** later in life.



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Photo: U.S. Army Sgt. Matthew Moeller



## AFGHANISTAN AND IRAQ VETERANS

*Restoring ill and injured Veterans of the wars in Iraq and Afghanistan to their highest level of functioning when they return home is an important challenge facing VA researchers.*

### ABOUT AFGHANISTAN AND IRAQ VETERANS

- The newest generation of Veterans is characterized by an increased number of Reservists and National Guard members who served in combat zones, and a higher proportion of women Veterans than in previous wars.
- According to VA's National Center for Posttraumatic Stress Disorder (PTSD), between 11 and 20 percent of Veterans who have served in Iraq and Afghanistan experience PTSD. Other common mental health issues include, mood, anxiety, sleep, psychotic and addictive disorders.
- Veterans wounded in Iraq and Afghanistan are surviving in greater numbers than in previous conflicts due to advances in body armor, battlefield medicine, and medical evacuation transport.
- Because of higher survival rates, more Veterans are living with disabling injuries, including the often lifelong effects of traumatic brain injury (TBI).

### VA RESEARCH ON AFGHANISTAN AND IRAQ VETERANS: OVERVIEW

- VA researchers are seeking new ways to address the mental health issues of Iraq and Afghanistan Veterans, including

PTSD. They are also researching TBI and its treatment, and are developing and testing prostheses that will allow Veterans with amputations or other issues to live as independently as possible.

- VA investigators have found that TBIs often lead to long-term mental and physical health problems that cause problems with employment, family relationships, and Veterans' ability to live in their communities.

- The Department of Defense (DoD) and VA have combined more than \$100 million to fund two new consortia aimed at improving diagnosis and treatment of PTSD and mild TBI.

- VA's Polytrauma System of Care is the largest integrated system of care dedicated to the medical rehabilitation of Veterans and service members with multiple, complex, severe injuries, often including TBI. VA researchers are working to better understand polytrauma and to treat Veterans who have suffered such injuries.

### SELECTED MILESTONES AND MAJOR EVENTS

**2001** – The U.S. is attacked by terrorists

**2003** – VA receives its first badly wounded patients from Iraq

**2006** – A VA study demonstrates that cognitive processing therapy has value as a treatment for PTSD. It is one of the two main evidence-based psychotherapies VA now provides for Veterans with PTSD; the other is prolonged exposure therapy

**2008** – VA begins a longitudinal cohort study of the longer-lasting health effects of service during the Iraq war

**2012** – VA, DoD team up to fund consortia to improve treatment for PTSD and mild TBI

### RECENT STUDIES: SELECTED HIGHLIGHTS

- **A major cooperative study** ([VA Cooperative study #566](#)) is examining the health effects of the Iraq war on Veterans of the conflict, especially in the area of mental health. More than 800 service members and Veterans are participating in this study.

- **Many Veterans returning from the conflicts in Iraq and Afghanistan are burdened with chronic pain.** According to a study by the VA HSR&D Center on Implementing Evidenced-Based Practice in Indianapolis, Veterans and others with chronic pain are uniquely positioned to offer support to others with pain, because they will listen with understanding and not overreact. ([Military Medicine](#), January 2014)

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- **Food insecurity, or lack of access to sufficient food for a healthful lifestyle, has been associated with poor health.**

More than 1 in 4 Iraq and Afghanistan Veterans reported food insecurity in 2013, with 12 percent reporting very low food security, according to a study by researchers at the VA HSR&D Center for Chronic Disease Outcomes Research in Minneapolis and the University of Minnesota. ([Public Health Nutrition](#), May 8, 2014, epub ahead of print)

- **Pregnant women who had previously served in Iraq or Afghanistan have a higher risk of developing gestational diabetes**

and hypertensive disorders related to pregnancy than other women having babies in the United States. Researchers at the VA Puget Sound Health Care System recommend that non-VA providers be aware of their patients' Veteran status and the associated elevated risk for complications. ([Journal of Women's Health](#), August 4, 2014, epub ahead of print)

- **Iraq and Afghanistan Veterans may be at increased risk of developing respiratory illnesses,** compared with non-deployed troops. Investigators at the South Texas Veterans Health Care System found that 6 percent of Veterans who served in Iraq and Afghanistan and received VA care between 2002 and 2011 met the criteria for one or more chronic pulmonary conditions, such as asthma, bronchitis, or emphysema. Another 10.5 percent met the criteria for chronic wheezing or coughing. (Paper presented at the 2014 [Military Health Systems Research Symposium](#).)

- **Pain, TBI, and PTSD co-occur in about 4 of 10 Veterans receiving polytrauma care from VA.**

When the three conditions co-occur, they are known as the "polytrauma clinical triad." There is research suggesting that each of the conditions by itself raises the risk of suicide. A study of more than 211,000 Veterans, based at VA's South Texas Health Care System, found that PTSD was the strongest risk factor of the three, especially when combined with depression and substance abuse. ([American Journal of Public Health](#), July 17, 2014, epub ahead of print)

- **A study of 90 Iraq and Afghanistan Veterans by researchers at the Durham (N.C.) VA Medical Center and Duke University**

found that changes in the levels of certain amino acids in the body may contribute to suicide risk among Veterans. According to the investigators, the amino acids in question are integral to regulating mood and behavior, although understanding their exact relationships to suicide risk will require further study. ([Military Medicine](#), May 2014)

- **Significant lower levels of neuropeptide Y,** a chemical secreted by the brain, were associated with PTSD among Iraq and Afghanistan Veterans, according to a team at the Cincinnati VA Medical Center and the University of Cincinnati. The findings may help explain why one service member develops PTSD while another recovers fine, despite similar war experiences. ([Psychoneuroendocrinology](#), February 2014)

- **Interviews with 34 Iraq and Afghanistan Veterans** on their experiences with suicide risk assessments in the military and at VA medical centers found that the Veterans felt hassled by being asked the same questions repeatedly; resented being asked personal questions by people they didn't know; and disliked when clinicians failed to make eye contact. Researchers at the Portland, Ore., VA Medical Center and Oregon Health and Science University hope to use the information to improve the quality of risk assessments. The investigators believe trust is the basis for effective suicide prevention risk screening and assessment. ([Journal of General Internal Medicine](#), September 2013)

- **The cerebral cortex is the outermost layer of the brain,** and is known as the brain's "gray matter." It plays a key role in memory, attention, and other mental tasks, and loses thickness with normal aging. VA Boston Healthcare System researchers found that having PTSD and a lifetime of exposure to trauma are both associated with reduced thickness in various areas of the cortex. Reduced thickness in the cortex has previously been linked to reduced brain functioning. ([Neuroimage: Clinical](#), April 22, 2013)

**For more information on VA studies on Afghanistan and Iraq Veterans, and other key topics relating to Veterans' health, please visit [www.research.va.gov/topics](http://www.research.va.gov/topics)**

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*The newest generation of Veterans, relative to those from previous wars, is characterized by an increased number of Reservists and National Guard members who served in combat zones, and a higher proportion of women.*

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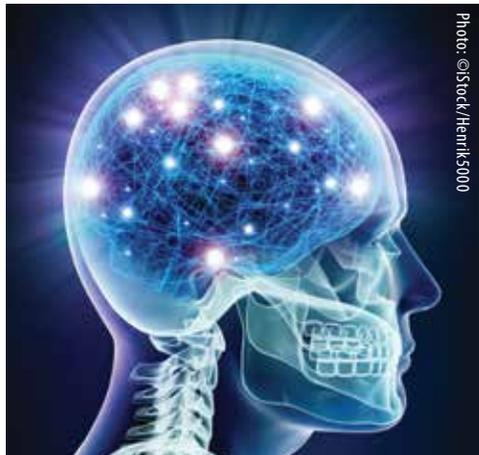


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## ALZHEIMER'S DISEASE

*Alzheimer's disease is one of the most common forms of dementia and is the sixth leading cause of death in the United States. VA researchers are looking at ways to delay and prevent the disease, and to support Alzheimer's caregivers.*

### ABOUT ALZHEIMER'S DISEASE

- Alzheimer's disease involves the deterioration of nerve cells in the brain, which in turn affects thoughts, memory, and language. Symptoms of Alzheimer's range from mild forgetfulness to an inability to perform everyday tasks.
- Dementia is a general term for disorders involving a decline in memory, thinking, judgment, and learning ability. Alzheimer's is one of the most common forms of dementia.
- Although physicians can almost always determine if a person has dementia, there is no single test available today that can show whether a person has Alzheimer's or is at risk of developing Alzheimer's.
- Studies have linked low brain levels of insulin to Alzheimer's, and to brain aging in general.

### VA RESEARCH ON ALZHEIMER'S DISEASE: OVERVIEW

- VA researchers are looking at ways to delay and possibly prevent the onset of Alzheimer's disease. They are also looking at new ways to detect the disease, to understand its connection to other illnesses and injuries, and to support those

who have the difficult responsibility of caring for Veterans with Alzheimer's.

- The Alzheimer's Disease Neuroimaging Initiative (ADNI), led by a VA investigator, is making it easier for clinicians to diagnose the disease in its early stages.
- Some VA researchers are working on potential drug therapies for the prevention and treatment of Alzheimer's. Others are exploring the genetic and environmental causes of the disease, and studying the best ways to provide long-term care for Alzheimer's patients.
- The department's Resources for Enhancing Alzheimer's Caregiver Health (REACH-VA) program provides much-needed support for caregivers of Veterans with Alzheimer's disease.

### SELECTED MILESTONES AND MAJOR EVENTS

- 1906** – German physician Alois Alzheimer first describes the disease
- 2004** – A VA investigator takes on leadership of a nationwide study to identify brain changes linked to Alzheimer's
- 2006** – VA establishes its Center for

Imaging of Neurodegenerative Diseases in San Francisco

**2008** – VA launches a nationwide expansion of an Alzheimer's caregiver program (REACH VA)

**2014** – A VA cooperative study finds that Vitamin E can significantly delay functional decline among patients with mild to moderate Alzheimer's

### RECENT STUDIES: SELECTED HIGHLIGHTS

- **A protein called beta-amyloid 42** collects in the brains of people with Alzheimer's disease, and low levels of the protein in the blood or spinal fluid indicate high levels in the brain. This may lead to a blood test that could be used as an easy-to-administer diagnostic screening test for Alzheimer's, according to researchers associated with ADNI. ([Alzheimer's & Dementia](#), July 2012)
- **A nasal insulin treatment improves memory**, thinking skills, and functional ability in people with Alzheimer's disease or mild cognitive impairment, according to researchers at VA's Puget Sound Health Care System in Seattle. Their study built on previous studies that linked low brain

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levels of insulin to Alzheimer's and to brain aging in general. ([Archives of Neurology](#), January 2012)

• **Regular exercise and a diet that's low in saturated fat and refined carbohydrates**, with lots of whole grains and vegetables, can reduce the levels of beta amyloid in spinal fluid and improve visual memory for both patients with mild levels of Alzheimer's and healthy older people, according to investigators at the VA Puget Sound Healthcare System. ([Journal of Alzheimer's Disease](#), 2012)

• **An ongoing study involving ADNI and Department of Defense (DoD)** researchers, funded by DoD, is looking to determine whether Vietnam Veterans with traumatic brain injury or posttraumatic stress disorder are at higher risk for Alzheimer's as they age. Past studies have clearly pointed to head injuries as a risk factor for dementia. ([Alzheimer's Disease Neuroimaging Initiative](#) website)

• **Taking supplemental Vitamin E significantly delays** the decline of cognitive functioning in patients with mild to moderate Alzheimer's disease. A five-year VA study showed that the

vitamin added, on average, six months of better cognitive functioning. ([Journal of the American Medical Association](#), January 1, 2014)

• **Veterans who have been a prisoner of war (POW)** have about a 50 percent greater risk of dementia in later life than other Veterans, according to a study by researchers with VA and the University of California, San Francisco. For those who had been a POW and also developed PTSD, the risk was more than double. Researchers believe stress hormones may play a role in these increased rates. ([Alzheimer's & Dementia](#), June 2014)

• **BCI-838, an experimental drug that appears to block plaque-forming beta amyloid** and spurs new brain cells, may be able to arrest Alzheimer's disease at an early stage. Researchers with the James J. Peters VA Medical Center in the Bronx and the Icahn School of Medicine at Mount Sinai Medical Center have tested the drug on mice, and hope to soon begin testing the drug on older adults. ([Molecular Psychiatry](#), August 12, 2014)

• **Veterans diagnosed with a traumatic brain injury** may be at

greater risk for developing dementia late in life. Over a period of nine years, investigators at the San Francisco VA and the University of San Francisco examined more than 188,000 Veterans, and found that 16 percent of Veterans with a past diagnosis of TBI developed dementia, compared with 10 percent among those with no history of TBI. Overall, having TBI was associated with a 60 percent increase in the risk of developing dementia for older Veterans. ([Neurology](#), July 22, 2014)

**For more information on VA studies on Alzheimer's disease and other key topics relating to Veterans' health, please visit [www.research.va.gov/topics](http://www.research.va.gov/topics)**

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# ARTHRITIS

*Arthritis affects more than 1 in every 5 adults. According to the U.S. Centers for Disease Control and Prevention, it is the nation's most common cause of disability.*

## ABOUT ARTHRITIS

- Arthritis is a term used to describe more than 100 rheumatic diseases and conditions that affect joints, the tissues that surround the joint, and other connective tissue.
- The pattern, severity, and location of arthritis symptoms can vary, depending on the specific form of the disease. The symptoms can develop gradually or suddenly.
- Typically, pain and stiffness in and around one of the joints characterize rheumatic conditions. Certain rheumatic conditions can also involve the immune system and various internal body organs.
- Scientists once thought arthritis resulted primarily from years of use of the joints; now they are exploring a complex web of biological factors that may contribute to the breakdown of body cartilage.

## VA RESEARCH ON ARTHRITIS: OVERVIEW

- VA investigators are attempting to get a better understanding of arthritis, developing effective medical and rehabilitation strategies, and determining the risks and outcomes of joint replacement surgery.

- VA researchers are working to understand the biological causes of two types of arthritis:

- Osteoarthritis, which is a disease characterized by degeneration of cartilage and its underlying bone within a joint; and
- Rheumatoid arthritis, an inflammatory disease that manifests itself in multiple joints of the body.

- VA's [Bone and Joint Rehabilitation Center of Excellence](#) is located in Palo Alto, Calif. The center's goal is to reduce pain and improve function in VA patients whose musculoskeletal system is impaired.

- The VA Rheumatoid Arthritis registry allows researchers to examine specific medical and biological information about hundreds of male patients to see what genetic and environmental factors may have played a role in the patients' disease.

## SELECTED MILESTONES AND MAJOR EVENTS

**2002** – VA Rheumatoid Arthritis registry started

**2006** – VA publishes the results of a major study on dietary supplements for arthritis, in collaboration with NIH

**2011** – Researchers from VA and Stanford University identify the role of the complement system in the development of osteoarthritis

**2013** – Researchers from VA and the University of Nebraska find that less expensive combinations of drugs work as well as newer, more expensive drugs to treat rheumatoid arthritis

## RECENT STUDIES: SELECTED HIGHLIGHTS

- **A nationwide clinical trial led by a VA investigator** with the Salt Lake City VA Medical Center and the University of Utah and involving nearly 1,600 patients with osteoarthritis of the knee found little overall benefit for the widely used nutritional supplements glucosamine and chondroitin sulfate. The study's findings did suggest that the supplements, taken in combination, might help those with more severe pain. ([New England Journal of Medicine](#), February 23, 2006)

- **Vitamin D insufficiency might be common in men with rheumatoid arthritis**, according to investigators at the Washington, DC, VA Medical Center. The researchers found that nearly 85 percent of the 850 men in the study had insufficient vitamin D. Men with vitamin D

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deficiency were also more likely to have many tender joints. ([Journal of Rheumatology](#), January 2011)

• **Researchers from the Palo Alto VA Medical Center and Stanford University** have provided new insights into immune-system changes that may trigger the breakdown of cartilage associated with osteoarthritis. They found that the complement system, a group of proteins that move freely through the bloodstream, plays an important role in the development of osteoarthritis and its spread. ([Nature Medicine](#), November 6, 2011)

• **Less expensive combinations of disease-modifying anti-rheumatic drugs** produced the same clinical benefits for patients with rheumatoid arthritis as much more expensive biological treatment in a study conducted by from the Omaha VA Medical Center and the University of Nebraska. The study included 353 patients at 16 VA medical centers, 12 rheumatoid arthritis investigational network sites, and eight Canadian medical centers. ([New England Journal of Medicine](#), July 25, 2013)

• **Veterans who have both rheumatoid arthritis and hepatitis C infections** report more tender joints and more pain than those who have arthritis but not hepatitis C, according to investigators at the Philadelphia VA Medical Center and the University of Pennsylvania. Their physicians, however, did not report finding significant differences in their patients in these areas. ([Arthritis Care & Research](#), September 3, 2014, epub ahead of print)

• **For Veterans with rheumatoid arthritis, a diagnosis of posttraumatic stress disorder (PTSD)** is associated with worse patient-reported outcomes and more tender joints, according to an Omaha VA study. Having a PTSD diagnosis was associated with higher levels of pain and physical impairment, a greater number of tender joints, and worse overall well-being. ([Arthritis Care & Research](#), February 2013)

• **African American patients are significantly less likely to undergo knee replacement** to manage their knee osteoarthritis. A team of VA researchers showed a video on the subject to 639 African-American patients with moderate to severe knee

osteoarthritis. Some of the patients in the study also received a brief counseling session. Either intervention significantly increased the willingness of patients in the study to consider knee replacement, and to talk with their doctors about knee pain and having themselves evaluated for surgery. ([Arthritis & Rheumatology](#), May 2013)

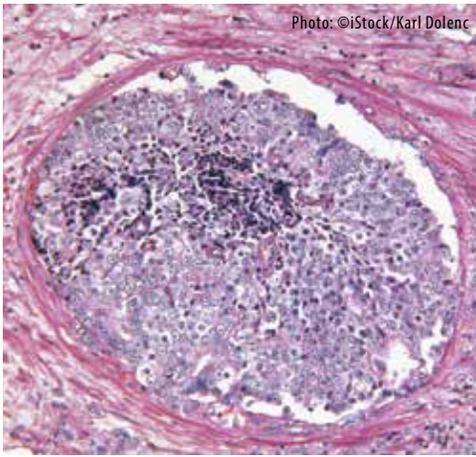
• **Ann Arbor VA researchers are conducting a trial** that tests activity pacing in people with osteoarthritis, with funding from the National Institutes of Health. Activity pacing is a strategy that involves planning rest breaks during the day, which helps to avoid arthritis flare-ups. A pilot study has indicated that tailored activity pacing reduces fatigue and makes daily activities easier. ([ClinicalTrials.gov](#))

**For more information on VA studies on arthritis and other key topics relating to Veterans’ health, please visit [www.research.va.gov/topics](http://www.research.va.gov/topics)**

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## CANCER

*Cancer is a general term that includes more than 200 different diseases. In all forms of cancer, cells in the body grow and multiply abnormally, eventually taking over and destroying normal tissue.*

### ABOUT CANCER

- The main type of cancer are leukemias and lymphomas, involving the blood and related tissues; carcinomas, which occur in the skin, glands, and certain organs; and sarcomas, which involve muscles and connective tissue.
- Around 40,000 cancer cases are reported to VA's central cancer registry annually, about 3 percent of all cancers in the United States.
- The five most frequently diagnosed cancers among VA cancer patients are prostate, lung and bronchial, colorectal, urinary and bladder cancers, and skin melanomas. This list is similar to that for American men as a whole.
- Colorectal, or colon, cancer can be cured if diagnosed early, yet one-third of patients who develop colon cancer will die from the disease.

### VA RESEARCH ON CANCER: OVERVIEW

- The very first centrally funded VA research laboratory was the department's tumor research unit, set up in Hines, in 1932. The unit did some of the first studies on the link between smoking and lung cancer.
- VA researchers conduct laboratory experiments aimed at discovering the

molecular and genetic mechanisms involved in cancer; studies looking at the causes of disease; clinical trials to evaluate new or existing treatments; and studies focused on improving end-of-life care.

- While most of the patients VA treats are male, the department is seeing increasing numbers of woman Veterans. VA researchers are therefore looking closely at breast cancer, its causes, and treatments for the disease.
- A VA cooperative study published in 2000 found that colonoscopic screenings (in which a long, flexible, tubular instrument is used to visually inspect the entire colon) could detect abnormal growths called neoplasms better than sigmoidoscopy (a flexible instrument that inspects only the lower colon).

### SELECTED MILESTONES AND MAJOR EVENTS

- 1932** - Tumor Research Laboratory established in Hines, Ill.—the first VA research lab to receive funding specifically for research
- 1950** – Robert Schrek, MD, of the Tumor Research Laboratory publishes paper concluding there is “strong circumstantial evidence” linking cigarette smoking with respiratory tract cancers

**1956** – First VA study published by Oscar Auerbach, MD, linking cigarette smoking with precancerous lesions

**1964** – Surgeon General's Smoking and Health report published

**1984** – VA researchers led by Jed E. Rose, PhD, develop a transdermal nicotine patch to reduce the craving for cigarettes

**2000** – VA researchers demonstrate the superiority of colonoscopy to sigmoidoscopy

**2012** – [Results](#) published from PIVOT prostate cancer trial

### RECENT STUDIES: SELECTED HIGHLIGHTS

- **Men with early-stage prostate cancer** who had their prostate surgically removed and those whose condition was simply watched by their doctors had no difference in survival rates, according to VA researchers. The findings were part of VA's Prostate Cancer Intervention Versus Observation (PIVOT) trial, (VA Cooperative Studies Program 407), ([Journal of the National Cancer Institute monograph](#), December 2012)
- **Surgery and radiation treatments for prostate cancer** both have serious side effects, but differences in side effects between the two kinds of treatments

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even out by 15 years after surgery, according to findings from VA's Prostate Cancer Outcomes Study, funded by the National Cancer Institute. Researchers conducting the study included a team at the Nashville VA Medical Center and Vanderbilt University. ([New England Journal of Medicine](#), January 31, 2013)

• **A combination of genes for prostate-specific antigen (PSA) and prostate stem cell antigen (PSCA) seems to stop prostate tumors from growing in mice.** When this combination was given as a vaccine to mice with prostate tumors, the mice churned out antigen-specific T cells that attacked the tumor cells—and 80 percent of the mice became tumor-free. ([Journal of Immunotherapy](#), June 2011)

• **While doctors use colonoscopy to find abnormal growths,** called polyps, which protrude from the lining of the colon, difficult-to-detect *flat* abnormal growths are more common in U.S. patients than was previously thought, according to researchers at VA's Palo Alto Healthcare System. These flat growths are much more likely to be cancerous than are polyps. Palo Alto researchers also recently found

that spraying with a blue dye makes it easier to find abnormal growths in the colon, including flat growths. ([Journal of Gastroenterology](#), June 2013)

• **A test that looks for blood and DNA mutations** in stool is highly accurate for detecting colorectal cancer, according to a VA trial led by researchers at the Indianapolis VA Medical Center. The trial involved nearly 10,000 men and women at 90 sites. On the basis of the research, the Food and Drug Administration approved the test in August 2014. ([New England Journal of Medicine](#), April 3, 2014)

• **The Gail model is a tool used to assess women's risk for breast cancer** and to estimate their chance of developing this form of cancer. Researchers with the Pittsburgh VA Healthcare System and the University of Pittsburgh surveyed 316 physicians in internal medicine, family medicine, and gynecology. They found that only 40 percent of the providers surveyed were using the model, with lack of time and familiarity with the model being the primary reasons the model was not used. ([Journal of Women's Health](#), September 2014)

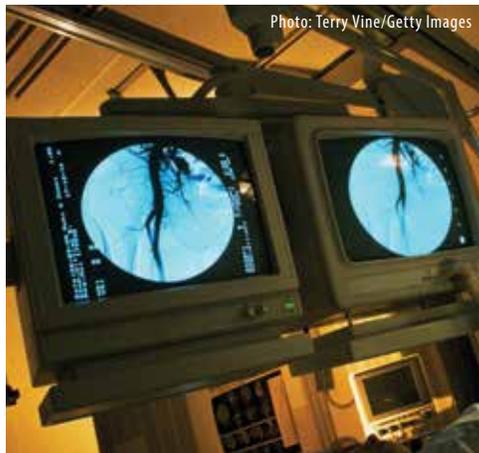
• **Up to 50,000 Veterans at 42 VA medical centers** are currently being enrolled in a trial that will compare the long-term health effects of colonoscopy screenings versus fecal occult blood testing (FOBT). FOBT is a simple test in which a small plastic device is used to sample feces. The sample is then checked in the lab for signs of human blood. The CONFIRM study is the second-largest VA Cooperative Studies Program effort to date. ([ClinicalTrials.gov](#))

**For more information on VA studies on cancer and other key topics relating to Veterans' health, please visit [www.research.va.gov/topics](http://www.research.va.gov/topics)**

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# CARDIOVASCULAR DISEASE

*Cardiovascular disease describes conditions ranging from high blood pressure to heart attacks and strokes. It is the number-one killer of Americans, and the leading cause of hospitalization in the VA health care system.*

## ABOUT CARDIOVASCULAR DISEASE

- Although there are many different forms of heart disease, the most common cause is a narrowing or blockage of the blood vessels that supply blood to the heart.
- Narrowing or blockage of these blood vessels is called coronary artery disease. It is the main reason people have heart attacks.
- Heart disease is associated with a number of other diseases that affect Veterans, including diabetes, spinal cord injury, and posttraumatic stress disorder (PTSD).
- Smoking is one of the leading risk factors for heart disease; smoking rates among Veterans are higher than among the general population.

## VA RESEARCH ON CARDIOVASCULAR DISEASE: OVERVIEW

- VA established its first cardiovascular research unit at its Washington, DC, hospital in 1935, five years after the establishment of the Veterans Administration.
- A VA study conducted in the 1960s presented the first definitive evidence that

treating moderate high blood pressure could help prevent or delay complications such as stroke and congestive heart failure.

- VA researchers are currently developing new treatments for cardiovascular disease and helping to improve existing treatments.
- VA is also making Veterans and their families aware of the risk factors for heart disease, such as smoking, high blood pressure, high cholesterol, obesity, lack of physical activity, and uncontrolled diabetes.
- VA's Clinical Assessment, Reporting and Tracking System for Cardiac Catheterization Laboratories (CART-CL) has developed a systematic, national method for tracking the use and outcomes of diagnostic and interventional cardiac catheterization procedures, and is implementing a national quality program.

## SELECTED MILESTONES AND MAJOR EVENTS

- 1935** – A series of articles is published in the *New England Journal of Medicine* about heart disease among Veterans
- 1960** – The first Veteran receives an implantable cardiac pacemaker, developed

by VA's Dr. William Chardack and his collaborator, engineer Wilson Greatbatch

- 1970** – The results of a landmark VA Cooperative Study on hypertension are published
- 1996** – VA develops clinical practice guidelines on cholesterol screening for the American College of Physicians
- 2006** – VA researchers find that balloon angioplasty and stenting do little to improve outcomes for patients with stable coronary artery disease who also receive optimal drug therapy and undergo lifestyle changes
- 2013** – A major study of abdominal aortic aneurysms provides valuable guidance on surgical treatment options

## RECENT STUDIES: SELECTED HIGHLIGHTS

- **Cardiologists use high-pressure inflation** to place coronary stents into narrowed arteries. A VA researcher with the Central Arkansas Veterans Health System has shown that applying high pressure for much longer than is the current practice—about 200 seconds, or seven times the normal duration—greatly improves stent placement and avoids complications

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down the road. ([Catheterization and Cardiovascular Interventions](#), March 1, 2014)

• **Patients with a common type of heart rhythm disorder**, atrial fibrillation, who switch their anticoagulant medication from warfarin (available as Coumadin and other brands) to dabigatran (sold as Pradaxa) were 1.47 times more likely to have a gastrointestinal bleeding event, according research from the Iowa City VA and University of Iowa. At the same time, those who switched also had a slightly lower risk of death. The findings may aid doctors and patients with treatment decisions. ([Neurology Reviews](#), 2014)

• **An experimental new gel, injected directly into the heart** in the days and weeks following a heart attack has shown promise in staving off heart failure. The technique, proven successful in pigs, was developed by researchers at the Dorn VA Medical Center in Columbia, S.C., and the University of South Carolina. ([Science Translational Medicine](#), February 12, 2014)

• **Emotional trauma not only affects the mind—it also affects the heart.** VA researchers have played a significant role in developing and understanding the link between trauma and poor physical health, and

an article by researchers with VA and the University of California, San Diego, poses the question to other researchers of whether PTSD is a “fast track to premature cardiovascular disease.” ([Cardiology in Review](#), January-February 2013)

• **Taking medications after a heart attack is key to a full recovery**, but for some patients that’s easier said than done. In a study by VA and the University of California, San Francisco, patients recovering from heart attacks took more of their medication on time when they received daily text messages reminding them to do so. ([Patient Education and Counseling](#), February 2014)

• **While it is generally better for people to have low LDL (“bad”) cholesterol levels**, there is no magic cholesterol number towards which patients and doctors should strive. The work of VA researchers Drs. Rodney Hayward and Harlan Krumholz helped lay the groundwork for new guidelines for the use of statin drugs for patients with high cholesterol. The guidelines were published by the American Heart Association and American College of Cardiology. ([Circulation](#), June 24, 2014)

• **Gender and racial differences in three risk factors for cardiovascular disease** were studied among 25,000

Veterans by investigators with the Durham VA Medical Center and Duke University. These risk factors included diabetes, hypertension, and hyperlipidemia (an abnormally high concentration of fats or lipids in the blood.) The researchers found that female Veterans have higher LDL cholesterol levels than males, and that African Americans have higher blood pressure, LDL cholesterol, and A1c (blood sugar) levels, after adjustments for age. ([Women’s Health Issues](#), September-October 2014)

• **One in 14 Veterans who underwent angioplasty to treat narrowed coronary arteries** delayed filling their clopidogrel prescriptions following the procedure, according to researchers with VA’s CART program. Clopidogrel is a blood thinner used to help prevent stroke, heart attack, and other health problems. Delays in filling clopidogrel prescriptions after angioplasty are associated with adverse options for patients. ([American Heart Journal](#), September 2014)

**For more information on VA studies on cardiovascular disease and other key topics relating to Veterans’ health, please visit [www.research.va.gov/topics](http://www.research.va.gov/topics)**

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*A VA study conducted in the 1960s presented the first definitive evidence that treating moderate high blood pressure could help prevent or delay complications such as stroke and congestive heart failure.*

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## CAREGIVERS

*Providing quality care to America's Veterans doesn't end with the Veterans themselves. It extends to their caregivers—the family members or other loved ones who tend to the everyday needs of disabled, chronically ill, or aging Veterans.*

### ABOUT CAREGIVERS

- Every day, about 62 million Americans provide long-term in-home care to a loved one or friend.
- The demands of caregiving leave many caregivers anxious, depressed, or susceptible to chronic illness themselves.
- In 2010, President Obama signed legislation authorizing VA to establish a wide range of new services to support certain caregivers of eligible Veterans who served after Sept. 11, 2001.
- Caregivers for Veterans can access a toll-free caregiver support line (1-855-260-3274), expanded education and training on caring for Veterans at home, and other support services such as counseling and support groups.

### VA RESEARCH ON CAREGIVERS: OVERVIEW

- VA researchers are developing resources caregivers need to improve Veterans' health, and also helping caregivers look after their own health and well-being.
- VA's Family and Caregiver Experience (FACES) study, conducted in 2009 and 2010, has shed light on the enormous burdens faced by caregivers of Veterans with polytrauma and other severe injuries.

- Other VA research programs are designed to provide support to caregivers of elderly Veterans, especially those with Alzheimer's disease.

### SELECTED MILESTONES AND MAJOR EVENTS

**2007** – REACH VA ([Resources for Enhancing Alzheimer's Caregiver Health](#)) program introduced

**2009** – VA FACES study begun, to help researchers understand more about the needs of caregivers for Veterans with traumatic brain injuries and polytrauma

**2009** – Development of VA Family Care Map, to ensure family members are fully involved in the care of veterans with polytrauma

**2010** – Caregivers and Veterans Omnibus Health Services Act becomes law

**2011** – VA's National Caregiver Support Line established

### RECENT STUDIES: SELECTED HIGHLIGHTS

- **To educate and support caregivers of Veterans with Alzheimer's disease** and help them develop better caregiving skills, VA researchers worked with the National Institutes of Health and several universities

to develop and test a six-month training program called REACH VA. Investigators with the Memphis VA Medical Center found caregivers completing the program reported a significantly decreased burden, less depression, and fewer frustrations. The number of troubling dementia-related behaviors of their loved ones also decreased. ([Archives of Internal Medicine](#), Feb. 28, 2011)

- **Posttraumatic stress disorder (PTSD) is strongly linked to problems with intimate relationships.** Researchers at the Boston VA Healthcare System and a university research center in Toronto found a 15-session therapy program for couples in which one partner had PTSD not only improved outcomes for those with PTSD, but also helped their partners, who often experience caregiver burden and emotional distress. ([Journal of the American Medical Association](#), August 15, 2012)

- **Veterans with mild traumatic brain injury (TBI) have difficulty adjusting to life back home**—and their families have difficulties as well. A study by researchers in the Durham, N.C., and Bronx VA medical centers found that group therapy for Veterans and their family members together makes it easier for Veterans to share their experiences, and to integrate the family into patient care. ([Psychiatric Services](#), June 2013)

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• **A low-cost, telephone-based intervention** aimed at getting Veterans to set healthy-living goals enlisted spouses to support them in this effort. The trial, based at the Durham VA Medical Center, provided nine monthly calls from a nurse to help Veterans set goals for healthy eating and physical activities and to create action plans. Spouses also received monthly calls to help them support their loved one's goals. The intervention improved the Veterans' diet and exercise habits. ([Preventive Medicine](#), January 2013)

• **Women are the primary caregivers for Veterans** who have completed acute rehabilitation for multiple complex, severe injuries, called polytrauma. According to VA's FACES study, led by researchers from VA's Center for Chronic Disease Outcomes Research in Minneapolis, 79 percent of those who provide care to polytrauma patients are women; 62 percent of those women are parents, and 32 percent are spouses. Nearly 25 percent of all caregivers reported that they provide

more than 40 hours per week of care. ([Journal of Head Trauma Rehabilitation](#), January-February 2012)

• **Many caregivers continue to provide care and support** even after their loved ones have been placed in long-term care facilities. A study by researchers at the Philadelphia VA Medical Center and the University of Pittsburgh found that while these caregivers initially experienced caregiver depression and anxiety, and felt a continued burden, all of these improved over an 18-month period—whether or not these caregivers received a psychosocial intervention developed by the researchers. However, complicated grief was significantly lower for caregivers who received the treatment. ([Reviews in Clinical Gerontology](#), January 1, 2014)

• **VA's Helping Invested Families Improve Veterans Experiences Study** (HI-FIVES) is looking at a skills-training program, developed by VA investigators, for caregivers of Veterans who have been referred to home and community-based long-term care.

Through the program, investigators hope to decrease the number of days these Veterans spend in emergency departments, hospitals, and nursing homes, and reduce depressive symptoms in caregivers. ([ClinicalTrials.gov](#))

**For more information on VA studies on caregivers and other key topics relating to Veterans' health, please visit [www.research.va.gov/topics](http://www.research.va.gov/topics)**

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*VA researchers are developing resources caregivers need to improve Veterans' health, and also helping caregivers look after their own health and well-being.*

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Photo: David Joel/Getty Images

## COMPLEMENTARY AND ALTERNATIVE MEDICINE (CAM)

*Complementary and alternative medicine (CAM) generally refers to products and practices that are not currently part of mainstream medicine. Complementary medicine is used along with standard medical care, and alternative medicine is used in place of standard care. In recent years, the term “integrative medicine” has also become popular, indicating a blend of mainstream and alternative practices.*

### ABOUT CAM

- In VA, CAM is most commonly used to help Veterans manage stress, or to promote general wellness.
- CAM is also often used to treat posttraumatic stress disorder (PTSD), depression, back pain, headache, arthritis, fibromyalgia (long-term pain throughout the body), and substance abuse.
- Many CAM treatments still lack formal rigorous clinical trials to test their safety and effectiveness.
- Most VA facilities provide CAM therapies, or refer patients to licensed practitioners. The most common CAM therapy used in VA is meditation.

### VA RESEARCH ON CAM: OVERVIEW

- VA researchers are conducting studies to determine which CAM therapies are truly effective, and for which conditions and populations they work.
- VA has recently funded studies of the effects of meditation on PTSD. Areas of current investigation include:
  - o The “mantram” technique of meditation, in which people silently

- repeat a word or phrase that holds personal meaning for them, and;
  - o Mindfulness-Based Stress Reduction, a type of meditation that promotes relaxation and has been shown to relieve pain.
- For PTSD and some other conditions, VA is also looking at the potential benefits of transcranial magnetic stimulation (TMR), which uses magnetic fields to stimulate nerve cells in the brain.
- Other modalities being studied by VA researchers include nutritional supplements, yoga, and acupuncture.

### SELECTED MILESTONES AND MAJOR EVENTS

- 2006** – VA researchers find that glucosamine and chondroitin sulfate, taken either alone or in combination, does not reduce pain effectively in patients with osteoarthritis of the knee
- 2011** – A VA survey determines that about 9 in 10 VA facilities provide CAM therapies or refer patients to licensed practitioners
- 2011** - VA expands funding for studying complementary and alternative medicine to treat PTSD and other conditions

**2012** – VA researchers report that women Veterans with chronic low back pain can benefit from yoga

### RECENT STUDIES: SELECTED HIGHLIGHTS

- **Saw palmetto is an herb believed to help symptoms of enlarged prostate**, such as painful urination and a need to urinate during the night. However, a recent review by investigators at the Minneapolis VA Medical Center found that the herb has no effect on these symptoms. ([British Journal of Urology International](#), June 2012)
- **The possibility that vitamin D may help slow prostate cancer** was studied by researchers at the Charleston VA Medical Center and the Medical University of South Carolina. Investigators looked at 45 patients with low-risk prostate cancer, all of whom took daily soft gels containing 4000 IUs of the vitamin. While there were no significant changes to the men’s PSA levels, 55 percent showed improvements in biopsy results after one year. In comparison, 11 percent showed no change, and 34 percent showed some worsening. ([Journal of Clinical Endocrinology and Metabolism](#), July 2012)

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# DEPRESSION

*Major depression is currently the leading cause of disability in the United States, and is projected to be the leading cause of disability worldwide by 2020.*

## ABOUT DEPRESSION

- Major depression is currently the leading cause of disability in the United States, and is projected to be the leading cause of disability worldwide by 2020.
- Fewer than 25 percent of Americans who have an episode of depression during a 12-month period receive appropriate treatment.
- Most experts believe a combination of genes and stressful life events can cause depression.
- Health problems such as anemia or an underactive thyroid gland can also lead to depression, as can certain medicines, such as steroids or narcotics.

## VA RESEARCH ON DEPRESSION: OVERVIEW

- VA researchers are making important headway in screening for, diagnosing, and treating depression and other mood disorders such as bipolar disorder, persistent despondency, and seasonal affective disorder.
- Investigators are exploring the genetic and molecular roots of these conditions.

- VA research has shown that a team approach to providing care can improve the management of depression and other mental health conditions.
- VA researchers are developing innovative models of family and social support to help Veterans with depression and other mental illnesses.

## SELECTED MILESTONES AND MAJOR EVENTS

- 2000** – The Heart and Soul Study, run by a team with VA and the University of California, San Francisco, begins enrolling patients. The study, focused on the link between mood disorders and heart disease, has produced more than 135 papers to date
- 2002** – VA’s National Registry for depression shows that 44 percent of VA patients receiving care for depression do so in primary care settings
- 2006** – A study is published describing the development and early success of VA’s TIDES research program, which offers an evidence-based collaborative approach to depression care

**2008** – Heart and Soul publishes findings that help explain the link between depression and heart disease

**2012** – VA researchers find that SNRI drugs may be more effective in treating depression than SSRI drugs

## RECENT STUDIES: SELECTED HIGHLIGHTS

- **People with depression and coronary heart disease** often have poorer outcomes than others with heart disease, but the reasons underlying the trend are unclear. VA and UCSF researchers with the Heart and Soul Study reported that it likely is because those with depression are more likely to smoke and less likely to exercise. ([Journal of the American Medical Association](#), November 26, 2008)
- **Veterans with depression are at about a 40 percent higher risk** than others for having a heart attack, according to investigators at the St. Louis VA Medical Center. The health histories of more than 350,000 Veterans showed that those with depression, unspecified anxiety disorders, panic disorders, and posttraumatic stress disorder are all at increased risk of heart attack. ([American Heart Journal](#), May 2010)

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• **Depression and dementia are common in older adults and often occur together.** Heart and Soul Study researchers found that people with depression in middle age are at an increased risk of developing vascular depression (depression caused by reduced or blocked blood flow to the brain) in old age, and that their mid-life depression could be a causal risk factor. ([Archives of General Psychiatry](#), May 2012)

• **Duloxetine, which is sold as Cymbalta, is part of a class of drugs called serotonin and norepinephrine reuptake inhibitors (SNRIs).** In a 12-week trial, VA researchers from the Richard E. Roudebush Medical Center in Indianapolis found that SNRIs are more effective in treating depression symptoms than drugs that affect only serotonin (SSRIs). ([International Clinical Psychopharmacology](#), January 2012)

• **VA patients with depression died, on average, five years earlier than VA patients without that diagnosis,** according to a study by researchers at the Ann Arbor VA Medical Center and the University of Michigan. The study used data on nearly 5 million Veterans. ([Psychiatric Services](#), August 1, 2012)

• **Skype, a popular video calling tool, is an effective way to deliver psychotherapy** to homebound older adults with depression, and is even more effective than in-home visits from a therapist, according to investigators at the Michael E. DeBakey VA Medical Center in Houston and the University of Texas. According to the authors, the approach has the potential to reach a large number of underserved older adults and improve their access to mental health services. ([Depression and Anxiety](#), August 2014)

• **Cotinine, a byproduct of nicotine, effectively reduced depression and memory loss** in mice, according to researchers at the Bay Pines VA Medical Center and the University of South Florida. Mice that were given daily doses of cotinine performed better in memory tests and proved more resistant to stress and depression. Another report from the same team demonstrated that cotinine reduced plaques associated with dementia and prevented memory loss in a mouse model of Alzheimer's disease. ([Behavioral Brain Research](#), July 15, 2014; [Journal of Alzheimer's Disease](#), 2011)

• **Whether talk therapy through in-home videoconferencing** can help treat older Veterans with major depression is the subject of an ongoing four-year study by researchers at the Charleston VA Medical Center. Preliminary results indicate that therapy for this group can be delivered just as effectively by in-home video teleconference as by face-to-face sessions, and that results are sustained after a year. ([VA Health Services Research and Development web site](#))

**For more information on VA studies on depression and other key topics relating to Veterans' health, please visit [www.research.va.gov/topics](http://www.research.va.gov/topics)**

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## DIABETES

*More than 20 million Americans have diabetes, and more than 40 million more Americans are at risk to develop the disease. Nearly [one in four](#) VA patients has the condition, including some who developed it as a result of being exposed to herbicides while serving in Vietnam.*

### ABOUT DIABETES

- Diabetes is a chronic disease marked by high levels of sugar in the blood. The body controls blood sugar through insulin, a hormone produced by the pancreas.
- People with diabetes have high blood sugar either because their pancreas doesn't make enough insulin, or their tissues don't respond normally to insulin.
- Symptoms of diabetes include blurry vision, excessive thirst, fatigue, frequent urination, hunger, and weight loss. Those with diabetes need to have their hemoglobin A1c levels checked every three to six months.
- A1c is a measure of average blood glucose during the previous two to three months. It is one of the markers, along with blood pressure and cholesterol control, of good diabetes care.
- Diabetes affects nearly [25 percent](#) of VA's patient population. The disease is also the leading cause of blindness, end-stage renal disease, and amputation for VA patients.

### VA RESEARCH ON DIABETES: OVERVIEW

- 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.

- Investigators are working to develop better ways to prevent or treat diabetes, especially in special populations such as the elderly, amputees, minorities, spinal cord injured patients, and those with kidney or heart disease.
- VA's [Diabetes Quality Enhancement Research Initiative](#) (QUERI), based in Ann Arbor, Mich., is committed to research and collaborations that promote the use of effective care strategies to help Veterans with diabetes, and those at risk for the disease, to live longer and better lives.
- Dr. [Rosalyn S. Yalow](#), a VA researcher, received the Nobel Prize for her work in developing radioimmunoassay, an extremely sensitive way to measure insulin and other hormones in the blood.

### SELECTED MILESTONES AND MAJOR EVENTS

- 1977** – Rosalyn S. Yalow receives the Nobel Prize in Physiology or Medicine
- 1989** – Minneapolis VA researchers demonstrate that an aggressive, comprehensive, wound-care protocol can prevent limb loss in most high-risk diabetes patients

**1996** – VA researchers find an implantable insulin pump offers better blood sugar control, weight control, and quality of life for type 2 diabetes (once known as adult-onset diabetes) than multiple daily injections

**2008** – Researchers publish the first results of the seven-year VA Diabetes Trial, which finds that intensive control of blood glucose in type 2 diabetes does little to cut the risk of heart disease

**2013** – VA begins participation in a long-term National Institutes of Health study testing the long-term benefits and risks of four widely used diabetes drugs in combination with metformin

### RECENT STUDIES: SELECTED HIGHLIGHTS

- **For seven and a half years, researchers involved in a VA cooperative study** (CSP 465) looked at nearly 1,800 patients with diabetes. Among other findings, the researchers learned that intensive glucose control in patients whose type 2 diabetes had previously been poorly controlled had no significant effect on the rates of major cardiovascular events such as coronary artery disease and stroke. ([New England Journal of Medicine](#), January 8, 2009)

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• **Researchers from the San Francisco VA Medical Center**, the University of California, San Francisco (UCSF), and the Kaiser Permanente Division of Research found that almost half of the 13,000 adults with type 2 diabetes they studied reported acute and chronic pain, and close to one-quarter reported neuropathy (nerve damage), fatigue, depression, sleep disturbance, and physical and emotional disability. ([Journal of General Internal Medicine](#), December 2012)

• **People with diabetes who had an episode of low blood sugar** (hypoglycemia) were twice as likely as other older adults to be later diagnosed with dementia, and those who developed dementia were three times as likely to later experience low blood sugar, according to VA/UCSF study. Stroke, heart attack, and high blood pressure did not factor into the relationship. ([JAMA Internal Medicine](#), July 22, 2013)

• **Sleep apnea and poor sleep quality predicted diabetes**, independent of other diabetes risk factors or mental health status, showed a study at the VA Puget Sound Health Care System. Sleep apnea increased the risk of diabetes by

78 percent, and simply having trouble sleeping increased the risk of diabetes by 21 percent. ([Diabetes Care](#), October 2013)

• **The combination of an angiotensin-converting enzyme (ACE) inhibitor and an angiotensin-receptor blocker (ARB)** increases the risk for serious adverse effects in patients with diabetic nephropathy, according to a VA study. The increase in risk caused by taking the combination of drugs overshadowed any benefits the drugs may have had in reducing the progression of kidney disease. ([New England Journal of Medicine](#), Nov. 14, 2013)

• **Veterans with diabetes enrolled in VA's Home-Based Primary Care** program had a significantly lower likelihood of being hospitalized from their previously existing ambulatory care sensitive conditions (ACSCs), according to a VA Boston Healthcare System study. ACSCs are medical problems that are potentially preventable and can be treated outside of a hospital. ([JAMA Internal Medicine](#), September 15, 2014)

• **In 2014, VA began enrolling Veterans to participate in a trial to**

determine the long-term effectiveness of four widely used, well-established diabetes drugs. The Glycemia Reduction Approaches in Diabetes (GRADE) trial will involve nine VA medical centers, along with 37 other clinical sites. It is funded by the National Institutes of Health. ([GRADE website](#))

• **A team of VA and Stanford University researchers** is conducting a point-of-care study involving more than 3,000 Veterans with diabetes. The study compares two methods of administering insulin to hospitalized Veterans, and is tracking which of the two treatments is associated with shorter hospital stays. Eventually, the system's software will begin to direct more patients into the treatment that is proving more effective. ([VA News Release](#), May 6, 2011)

**For more information on VA studies on diabetes and other key topics relating to Veterans' health, please visit [www.research.va.gov/topics](http://www.research.va.gov/topics)**

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*Dr. Rosalyn S. Yalow, a VA researcher, received the Nobel Prize for her work in developing radioimmunoassay, an extremely sensitive way to measure insulin and other hormones in the blood.*

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## GASTROINTESTINAL HEALTH

*Gastroenterology is a medical specialty dealing with the diagnosis and treatment of disorders of the digestive system. Such disorders may involve the digestive tract, the pancreas, the liver, or the gallbladder.*

### ABOUT GASTROINTESTINAL HEALTH

- More than 1 million Americans have inflammatory bowel disease (IBD), a term that includes Crohn's disease and ulcerative colitis. Crohn's disease is a chronic inflammatory condition of the entire gastrointestinal tract, and ulcerative colitis is an inflammation limited to the colon.
- Frequent heartburn, or gastroesophageal reflux disease (GERD), is a common gastrointestinal issue. About one in 10 Americans experiences GERD symptoms at least once a week.
- Colorectal, or colon, cancer refers to cancer that is found in either the colon or the rectum. This type of cancer is the third most common cancer diagnosed in the United States.
- Gastrointestinal problems are among the illnesses reported by Gulf War Veterans. Irritable bowel syndrome (IBS), which is marked by chronic, cramping, bloating, and diarrhea, is one of a range of illnesses some Gulf War Veterans have experienced.

### VA RESEARCH ON GASTROINTESTINAL HEALTH: OVERVIEW

- [Dr. Morton I. Grossman](#), former chief of gastroenterology at the Greater Los

Angeles VA Medical Center, is considered the father of modern gastrointestinal physiology. The broad theme of his research was how nerves and hormonal influences control gastrointestinal secretions such as hormones, mucus, and acid, especially as this relates to peptic ulcers.

- [Dr. Rosalyn S. Yalow](#), one of VA's three Nobel laureates, devoted much of her research to the study of gastrointestinal hormones.
- [Dr. Andrew V. Schally](#), another of VA's Nobel laureates, has demonstrated that the hypothalamus, a part of the brain, regulates the endocrine system. The endocrine system includes the pituitary, thyroid, and adrenal glands; the pancreas; and the ovaries and testicles.
- VA researchers are looking for potential drug therapies to help Veterans with stomach ulcers, IBS, IBD, colon cancer, GERD, and other issues. They are also exploring a variety of nondrug treatments and developing supportive strategies for Veterans during and after their treatment.

### SELECTED MILESTONES AND MAJOR EVENTS

**1955** – Morton I. Grossman begins work at VA, and remains until his death in 1982

**1977** – Rosalyn S. Yalow receives the Nobel Prize in Physiology or Medicine for her work in developing the radioimmunoassay, a way to measure insulin and other gastrointestinal hormones in the blood

**2000** – VA Cooperative Study 380 finds that colonoscopies can detect more possible colon cancers than sigmoidoscopies

**2010** – VA researchers begin Cooperative Study 577, to determine whether colonoscopy or fecal immunochemical tests are better at reducing mortality from colon cancer

**2013** – VA researchers provide information to gastroenterologists on innovative research-based methods to improve the cancer detection rate of colonoscopy

### RECENT STUDIES: SELECTED HIGHLIGHTS

- **Researchers from the Michael E. DeBakey VA Medical Center in Houston** and Baylor College of Medicine found that taking the drug infliximab (sold as Remicade) together with an immunomodulator significantly reduces the risk of hospitalization and surgery after one year in men with inflammatory bowel disease. ([Clinical Gastroenterology and Hepatology](#), October 2013)

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• **A study of 34,665 Veterans by researchers at the Southeast Louisiana Veterans Health Care System**, Tulane University, and Louisiana State University found that men taking steroids for ulcerative colitis were nearly nine times as likely to develop low bone mineral density (BMD), compared with non-steroid users. BMD is a risk factor for fragility bone fractures, and those who used steroids were nearly twice as likely to have a fragility fracture. (*The Journal of Clinical Endocrinology and Metabolism*, June 2013)

• **About one in 10 Americans experiences GERD symptoms at least once a week.** People who are obese are more likely to have GERD. A study of patients treated at the Kansas City, Mo., VA Medical Center and the University of Kansas showed that weight was not a factor in the success of the strongest treatment available for frequent heartburn, the proton-pump inhibitor esomeprazole. (*Journal of Clinical Gastroenterology*, September 2013)

• **Current antibiotic therapies to treat H. pylori bacteria**—a major cause of ulcers—may be obsolete, because the bug is now resistant to many common antibiotics. VA’s Dr. David

Graham and two non-VA colleagues suggest that improving counseling and education for patients; reviewing the patient’s personal history with antibiotics; and taking into account local patterns of antibiotic resistance can boost the effectiveness of antibiotic regimens. (*Clinical Gastroenterology and Hepatology*, February 2014)

• **VA Cooperative Study 456 looked at two different methods of repairing inguinal hernias**—open mesh surgery and laparoscopic mesh repair. Investigators found that patients who had the laparoscopic surgery were more likely to have a recurrence of the hernia, and had a higher rate of complications—although they also had less initial pain and returned to their normal activities one day earlier, on average. (*New England Journal of Medicine*, April 29, 2004)

• **Researchers at the Richard A. Roudebush VA Medical Center in Indiana** and the Indiana University School of Medicine conducted a 90-site study to evaluate a new DNA test for colon cancer. The team found that the test, which evaluates the DNA found in people’s stool, detects significantly more cancers than the currently available stool evaluation test. However,

it does so at the cost of more false-positive results. (*New England Journal of Medicine*, April 3, 2014)

• **VA Palo Alto researchers authored an article about a dye technique** developed in Japan that can find flat lesions in the colon that may not be found in traditional colonoscopies. The dye technique involves spraying the colon with a blue dye to make it easier to find abnormal growths. (*Gastroenterology*, June 2013)

• **Clostridium difficile is an infectious germ that kills some 14,000 Americans every year.** A team of VA researchers suggest that C. diff not only takes hold in the gut after antibiotics kill off competing friendly bacteria, but that the bug is also provoked by antibiotic treatment to produce higher levels of harmful toxins. (*Journal of Medical Microbiology*, May 2013)

**For more information on VA studies on gastrointestinal health and other key topics relating to Veterans’ health, please visit [www.research.va.gov/topics](http://www.research.va.gov/topics)**

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*VA researchers are looking for potential drug therapies to help Veterans with stomach ulcers, IBS, IBD, colon cancer, GERD, and other issues. They are also exploring a variety of nondrug treatments and developing supportive strategies for Veterans during and after their treatment.*

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## GULF WAR VETERANS

*Nearly 700,000 men and women served in the Persian Gulf during operations Desert Shield and Desert Storm. At least a quarter of them continue to report troubling health symptoms that are not easily diagnosed.*

### VA RESEARCH ON GULF WAR VETERANS: OVERVIEW

- Nearly 700,000 men and women served in the Persian Gulf in 1990 and 1991, during operations Desert Shield and Desert Storm. At least a quarter of them continue to report troubling health symptoms that are not easily diagnosed.

- VA researchers are continuing to learn about these conditions and identifying the best ways to diagnose and treat them. Funding for these efforts has increased in recent years.

- The efforts are guided by a [strategic plan](#) for Gulf War research that was developed with input from leading scientists and researchers, physicians, and Veterans themselves. The plan is periodically updated to make sure it incorporates the latest knowledge.

- Along with the specific topics outlined in the strategic plan, VA investigators are conducting research in many other areas important to Gulf War Veterans. These include pain, autoimmune disease, neurodegenerative disease, sleep disorders, gastrointestinal disorders, respiratory problems, and other chronic diseases.

- VA's Office of Public Health (OPH) focuses on epidemiology and surveillance [studies](#), whereas the Office of Research

and Development (ORD) concentrates on studies aimed at improving diagnosis and treatment for Gulf War Veterans. This work includes research on toxins to which many Gulf War Veterans were exposed.

### SELECTED MILESTONES AND MAJOR EVENTS

**1990** – Iraqi troops invade Kuwait

**1990** – Coalition forces deployed to Saudi Arabia (Operation Desert Shield)

**1991** – Operation Desert Storm launched

**1995** – Baseline survey conducted for [longitudinal health study](#) of Gulf War Era Veterans, led by VA's Office of Public Health

**1998** – Research advisory committee on Gulf War Veterans' Illnesses created by Congress

**2003** – Results published from large VA [trial](#) of cognitive behavioral therapy and aerobic exercise for Gulf War Veterans' illnesses

**2003** – Epidemiologic [study](#) finds increased risk of amyotrophic lateral sclerosis (Lou Gehrig's disease) among Gulf War Veterans

**2005** – First follow-up survey conducted of Veterans taking part in longitudinal health study

**2012** – First Gulf War Research strategic plan developed

**2013** – Second follow-up survey conducted of Veterans taking part in longitudinal health study

### RECENT STUDIES: SELECTED HIGHLIGHTS

- **Researchers with the Northport, N.Y., VA Medical Center** found that 96 percent of Gulf War Veterans with chronic multisymptom illness experienced breathing problems while they slept, compared to only 36 percent of Gulf War Veterans without multisymptom illness. The research team [also found](#) that a therapy called nasal continuous positive airway pressure (CPAP) can ease breathing and sleep problems. ([Sleep and Breathing](#), September 2011—two articles)

- **A San Francisco VA team used magnetic resonance imaging** to examine the brains of Veterans who were exposed to the chemical warfare agents sarin and cyclosarin and those who were not exposed. The imaging study identified differences between the two groups, including reduced gray matter volume and additional central nervous system disorders in those exposed ([Neurotoxicology](#), December 2011)

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• **Poor sleep quality is associated with reduced gray matter volume in the brain**, according to researchers at the San Francisco VA and the University of California, San Francisco. An MRI study of 144 Gulf War Veterans found that those with the poorest ability to sleep had reduced brain volume, compared with others. ([Sleep](#), March 1, 2014)

• **Researchers with the Cincinnati VA Medical Center and Ohio State University** identified a small RNA segment that blocks a gene that makes glutamine, an amino acid essential for the health of the colon. While glutamine is already in use as a supplement to treat many digestive ailments—namely those that involve diarrhea, bloating, and abdominal pain—the new research may suggest ways to boost the production of glutamine in the body. Gut conditions such as irritable bowel syndrome affect substantial numbers of Gulf War Veterans. ([Gut](#), June 2010)

• **A VA study found no link between Gulf War deployment and multiple sclerosis risk.** The research team compared the clinical and military histories of nearly 700,000 deployed and 1.8 million non-deployed personnel from

the Gulf War era to look for trends in multiple sclerosis and other diseases that cause deterioration of the myelin sheath that insulates nerves and allows them to function. ([Neuroepidemiology](#), 2014)

• **A VA group in Minneapolis is searching for biomarkers** for the chronic multisymptom illness associated with Gulf War deployment, and to distinguish it from other conditions that may share some symptoms. The team has identified abnormalities in a protein called “tissue factor” that have been found in blood samples of Gulf War Veterans. The protein starts the blood coagulation process in the body. In related work published in 2013, the team found markers relating to a chronic inflammatory state—such as elevated platelets and C-reactive protein—in chronically ill Gulf War Veterans. ([Blood Coagulation and Fibrinolysis](#), October 2013)

• **A team with the Durham VA Medical Center and Duke University** showed how exposure to chemicals linked to Gulf War illness—pyridostigmine bromide, permethrin, and DEET—caused mood and memory problems in rats. Adding mild stress on the animals worsened the

problems. The researchers pinpointed the specific changes in the brain that appeared to be responsible for the functional decline, such as reduced volume and increased inflammation in the hippocampus, and the loss of specific neurons. The study suggests that treatment strategies focused on brain cell regeneration and inflammation reduction may help Gulf War symptoms. ([Neuropsychopharmacology](#), November 2013)

• **VA researchers are conducting a genetic study of Gulf War Veterans** that includes collecting survey data and banking blood in a “biorepository.” The goal is to better understand genetic influences on Gulf War illness and responses to treatment. Veterans enrolled in the study complete surveys about their health every six months, and agree to donate their brain and other body tissues for future research upon their deaths. (VA Office of Research and Development [website](#))

**For more information on VA studies on Gulf War Veterans and other key topics relating to Veterans’ health, please visit [www.research.va.gov/topics](http://www.research.va.gov/topics)**

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*Studies have shown that men and women deployed to the Persian Gulf during operations Desert Shield and Desert Storm reported, and continue to report, more health problems than those who were not deployed.*

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Photo: Tommy Leonardi



## HEALTH CARE DELIVERY

*VA has a nationwide team of health services researchers who study health care itself. They look at everything from the computer technology used in health care to small talk between doctors and patients during an office visit.*

### ABOUT HEALTH CARE DELIVERY

- Health services researchers play a vital role in shaping how health care is delivered, focusing on access to care, cost, and quality.
- One aspect of health service research is identifying the traits of a well-functioning health care system, and developing meaningful measures that show how a system is doing.
- Some health services researchers look at ways to use the power of computers in health care, and others look at how the Internet can improve care.
- Health services researchers also look at new ways to do research itself, including shortening the time it takes to conduct research projects and having the results adopted so they can help people.

### VA RESEARCH ON HEALTH CARE DELIVERY: OVERVIEW

- VA's Health [Services Research and Development](#) (HSR&D) Service works to find new ways to provide accessible, high quality, cost-effective care for Veterans and the nation.

- HSR&D's 19 [Centers of Innovation](#) and four resource centers support research that helps people understand how the VA health care system works and identifies and tests ways to improve VA care.
- VA's [Collaborative Research to Enhance Transformation and Excellence](#) (CREATE) initiative helps HSR&D investigators work together with others within VA to study important issues that affect the health and health care of Veterans.
- VA's [Quality Enhancement Research Initiative](#) (QUERI) improves VA health care by helping to implement the findings and recommendations of researchers into everyday care.
- The VA [Evidence-based Synthesis Program](#) analyzes and summarizes the latest research findings on issues of critical importance for VA clinical leaders and policymakers.
- The [VA Technology Transfer Program](#) (not part of HSR&D) helps bring worthy discoveries and inventions made by VA researchers into medical practice.

### SELECTED MILESTONES AND MAJOR EVENTS

- 1929** – VA's first research in the area of health care delivery compares care at its hospitals with that provided at civilian hospitals
- 1960** – HSR&D office started at the Fort Howard, Md., VA Medical Center
- 1998** – VA QUERI started to help bring research results into clinical practice
- 1999** – VA's [National Center for Patient Safety](#) established
- 2013** – VA CREATE Centers of Excellence funded

### RECENT STUDIES: SELECTED HIGHLIGHTS

- **Investigators at the Iowa City VA Health Care System** looked at a Web-based education program to help women who served in Iraq and Afghanistan with their mental health and other concerns. More than 72 percent of the women indicated they would recommend the program to others. The program was also effective in getting women to seek needed care. ([VA HSR&D website](#))

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- **Around 12 million Americans are misdiagnosed yearly**, according to research at VA's Houston-based [Center for Innovations in Quality, Effectiveness, and Safety](#). The researchers say their findings should encourage further efforts toward reducing such errors. ([BMJ Quality & Safety](#), September 2014)
- **Patient Aligned Care Teams (PACTs) are changing how primary care is delivered in VA.** These teams aim to deliver care to Veterans that is patient-driven, team-based, comprehensive, and coordinated. A study led by a team at the Ann Arbor VA Medical Center found that VA made good progress in implementing PACTs during the first 30 months of a four-year plan. ([American Journal of Managed Care](#), July 1, 2013)
- **VA's eHealth Quality Enhancement Research Initiative surveyed 106 homeless Veterans.** The study found that 89 percent of them had a mobile phone and that 76 percent of them used the Internet. Nearly all of the homeless Veterans were interested in getting mobile phone reminders about

their medical appointments. Also, 88 percent wanted to be asked by mobile phone if they would like to schedule an appointment when it was time to do so. ([Telemedicine Journal and e-Health](#), September 2014)

- **Veterans who were able to view their health records online** as part of a pilot program told researchers at the Portland, Ore., VA Medical Center that they communicated better with their doctors and were happier with their care. This jibes with previous research showing that shared electronic health records help both patients and those who care for them. ([Journal of Medical Internet Research](#), March 27, 2013)

- **A recently funded study is using VA's Veterans Informatics and Computing Infrastructure (VINCI)** to develop an automated way to better diagnose and care for five common cancers. The work is expected to help prevent delays in diagnosis and streamline follow-up on abnormal test results. ([VA HSR&D website](#))

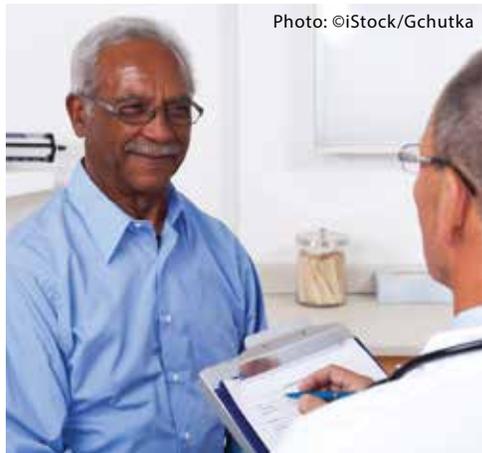
- **Between 2006 and 2013, VA served approximately 2,600 transgender Veterans**, and the numbers are increasing. According to VA's Office of Patient Care Services, an increase in diagnoses of gender dysphoria—a conflict between one's physical gender and how he or she identifies—may be partly the result of new VA policies and efforts to educate providers. ([American Journal of Public Health](#), September 2014)

**For more information on VA studies on health care delivery and other key topics relating to Veterans' health, please visit [www.research.va.gov/topics](http://www.research.va.gov/topics)**

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*One aspect of health service research is identifying the traits of a well-functioning health care system, and developing meaningful measures that show how a system is doing.*

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## HEALTH CARE DISPARITIES

*VA researchers identify differences in health care between populations of Veterans, such as whites and non-whites; work to understand the reasons these differences exist; and develop and test ways to reduce and eliminate them.*

### ABOUT HEALTH CARE DISPARITIES

- Health care is distributed unevenly in the United States, and minority populations often receive less care than others.
- Members of minority communities have higher rates of chronic illnesses such as diabetes and high blood pressure. They also have higher rates of many cancers, and those cancers often reveal themselves at later stages when they are harder to treat.
- There are no simple reasons for differences in care between groups, and there are also no simple solutions. Many things contribute to this problem.
- Among the causes of health care disparities are access to care, income, education, social class, prejudice, and discrimination.

### VA RESEARCH ON HEALTH CARE DISPARITIES: OVERVIEW

- VA aims to provide the highest quality health care to all Veterans, regardless of racial or ethnic background, gender, sexual orientation, or age.
- As the nation's largest health care system, VA offers a unique opportunity to understand the complex reasons why

health care disparities may occur, and to develop and evaluate patient-centered and culturally sensitive ways to offer care.

- One of the nation's premier research sites for researching health care disparities is VA's [Center for Health Equity Research and Promotion](#) (CHERP).
- A primary goal of [VA's Cooperative Studies Program Epidemiology Center](#) is to investigate the sources of disparities in the delivery and outcomes of medical care through VA-based population research.

### SELECTED MILESTONES AND MAJOR EVENTS

**2001** – VA's Center for Health Equity Research and Promotion (CHERP) is founded

**2007** – Publication of the VA report [Racial and Ethnic Disparities within the VA Healthcare System: a Systematic Review](#)

**2012** – Publication of the VA report [Rural vs. Urban Ambulatory Health Care: a systematic review](#)

**2012** – Researchers find that African American Veterans with diabetes could benefit from being mentored by their peers

### RECENT STUDIES: SELECTED HIGHLIGHTS

- **A team from the VA Boston Healthcare System and Harvard Medical School** found that overall death rates in VA medical centers were about the same between hospitals that serve many minority Veterans and those that do not. However, death rates were higher for heart attacks and pneumonia in hospitals that serve many minorities. ([Journal of Healthcare Quality](#), November-December 2010)
- **A team at the James J. Peters VA Medical Center in the Bronx, with help from the San Juan VA Medical Center,** is studying generic risk factors for schizophrenia among countryside-dwelling Puerto Ricans and their New York-based relatives. The investigators are honing in on a gene known as AMACR. Mutations in the gene may play a key role in schizophrenia risk among Puerto Ricans, especially in men. ([Schizophrenia Research](#), December 2010)
- **A study conducted at the Bedford, Mass., VA Medical Center looked at 299 African Americans with hypertension.** Half were given DVDs of fellow patients talking about their experience with high blood pressure and offering them advice on the subject. Those given the DVD had

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a larger drop—12 points on average—in systolic blood pressure (the top number). (*Annals of Internal Medicine*, January 18, 2011)

**• One hundred and eighteen minority Veterans trying to control their diabetes were divided into three groups by VA CHERP researchers.**

One group received only usual care. A second received counseling from trained peer mentors. A third became eligible for up to \$200 if they significantly lowered their hemoglobin A1c levels—a measure of blood sugar—over six months. The peer mentoring program worked well, but money rewards didn't have the same benefit. (*Annals of Internal Medicine*, March 20, 2012)

**• A review by researchers at VA's Minneapolis Health Care System of more than 1,300 previous studies**

found evidence that there were few differences in the care provided to rural and urban Veterans in some areas, such as mental health care. However, the study also found little research had been done to study possible difference in other areas important to Veterans,

such as traumatic brain injury. (*Rural vs. Urban Ambulatory Health Care: a systematic review*, May 2011)

**• Heart disease is the leading cause of death for American women,** and racial minorities are especially at risk. CHERP researchers found that women Veterans have higher LDL (bad) cholesterol levels than male Veterans, and African-American Veterans have higher blood pressure, more bad cholesterol, and higher hemoglobin A1c levels than white Veterans, after adjustments for age. The researchers say understanding these patterns may help to develop targeted treatments and strategies. (*Women's Health Issues*, September-October 2014)

**• Black patients have higher rates of stroke and major hemorrhage**

(the escape of blood from a ruptured blood vessel) compared with white patients. VA researchers in Bedford, Mass., looked at how black and white patients given warfarin (a drug that keeps blood from clotting) were treated. They found that after they accounted for age, hospitalization, poverty, and other patient characteristics, very little racial disparity remained. This suggests

there is little biological basis for the difference. (*American Journal of Medical Quality*, March 18, 2014)

**• The percentage of African American VA patients with diseases in which heredity plays a significant role in diagnosis, disease progression, and treatment is very high.** VA is ahead of many hospital systems in providing access to genomic medicine, which is the use of peoples' individual genetic profiles to customize their health care. However, according to several VA researchers, the department can, and should, do more. (*American Journal of Public Health*, September 2014)

**For more information on VA studies on health care disparities and other key topics relating to Veterans' health, please visit [www.research.va.gov/topics](http://www.research.va.gov/topics)**

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*As the nation's largest health care system, VA offers a unique opportunity to understand the complex reasons why health care disparities may occur.*

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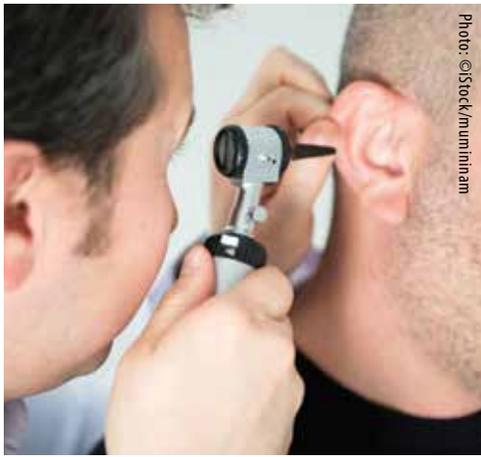


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## HEARING LOSS

*Hearing loss and tinnitus affect millions of Americans, including many, if not most, older people.*

### ABOUT HEARING LOSS

- More than 28 million Americans have some kind of hearing loss, and when combined with tinnitus (a ringing, buzzing, or other type of noise that originates in the head), hearing issues are the most common service-connected disability among American Veterans.
- In [2013](#), 1.1 million Veterans received compensation for tinnitus, and more than 850,000 for hearing loss.
- Among the possible causes of hearing loss are allergies, infections, drugs, exposure to noise, heredity, or simply aging.
- Some hearing loss can be reversed through surgery or medicine. When hearing loss is permanent, it can be reduced through the use of hearing aids.
- Though almost everyone with hearing loss can be helped by hearing aids, only about 1 in 5 uses them.
- Many Veterans score normally on hearing tests but have trouble understanding speech. This condition, called auditory processing disorder, is often associated with exposure to blasts.

### VA RESEARCH ON HEARING LOSS: OVERVIEW

- VA researchers are studying ways to prevent, diagnose, and treat hearing loss. They are also addressing a wide range of problems caused by tinnitus and blast exposure.
- Among the specific issues VA researchers are looking at are ways to measure hearing loss; how certain diseases, like diabetes, affect hearing; how hearing loss affects speech recognition; and how noise damage and getting older combine to cause hearing problems.
- VA has established a designated center of excellence for these issues, the [National Center for Rehabilitative Auditory Research](#) (NCRAR) in Portland, Ore. Other major sites for hearing loss research in VA include Mountain Home, Tenn., and Loma Linda, Calif.

### SELECTED MILESTONES AND MAJOR EVENTS

- 1992** – VA and the National Institutes of Health (NIH) begin working together to support the development of better hearing aids
- 1995** – NIH, the National Aeronautics and

Space Administration (NASA), and VA join forces to survey all federal laboratories for ideas to help develop better hearing aids

**1996** – VA and NIH begin a clinical trial to see which of three types of hearing aids work best in both quiet and noisy environments

**1997** – VA establishes the National Center for Rehabilitative Auditory Research

**2005** – VA publishes a guide for doctors to help their patients manage their tinnitus

**2014** – Researchers link exposure to jet propulsion fuel to trouble understanding other people's speech

### RECENT STUDIES: SELECTED HIGHLIGHTS

**Noise-induced hearing loss results from being exposed to loud sounds, especially over a long period of time.** Taking the right precautions can prevent this type of hearing loss. NCRAR has developed a program to teach service members and Veterans about the effects of being exposed to noise on their jobs and in their spare time, and shows them ways to protect their hearing. ([Journal of Rehabilitation Research & Development](#), Volume 49 Number 4, 2012)

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**Researchers from the Puget Sound VA Medical Center asked 644 Veterans to attend visits for hearing aid fittings and follow up.** Some visits were for an entire group of Veterans; others were seen alone. The team found no differences in how well the hearing aids performed, or how often they were worn, between the two groups. Group visits cost about half of what individual visits cost. (*Journal of Rehabilitation Research & Development*, Volume 50 Number 4, 2013)

**Tinnitus is common in Veterans, but there are no good tests to diagnose the problem.** NCRAR researchers and researchers from Oregon Health and Science University conducted three kinds of testing to try to distinguish Veterans with tinnitus from those who don't have it. They found some differences between the groups, but no single test or series of tests could reliably determine the condition. Researchers are continuing to work on developing a reliable test. (*Journal of Rehabilitation Research & Development*, Volume 50 Number 4, 2013)

**Problems with vision and hearing are common among Veterans who have had traumatic brain injury (TBI).** VA researchers found that 9.9

percent of 21,000 Veterans looked at for TBI in VA outpatient clinics reported vision problems, 31.3 percent reported hearing problems, and 34.6 percent reported both vision and hearing issues. (*Journal of Head Trauma Rehabilitation*, November-December 2011.)

**Frequency modulation (FM) may help Veterans who have normal hearing but have problems understanding speech due to mild TBI,** according to investigators from NCRAR and the Tampa VA Medical Center. The researchers tested a system that uses radio waves to transmit signals directly from a microphone to an earpiece to make a speaker's voice more clear. They also tested a "brain-training" computer program that has users follow instructions or interpret sound. Early results showed that the system helped those using the system to better understand speech. (*ClinicalTrials.gov*)

**A team of researchers from the Loma Linda, Calif., VA Medical Center** found exposure to jet propulsion fuel-8 (JP-8) is linked with changes that occur inside the brain rather than the ear. These changes, unlike other forms of hearing loss, allow people to hear sounds properly, but the brain has a hard time understanding the message. The

research team believes that chemicals in JP-8 called hydrocarbons may be the reason this occurs. (*Journal of Toxicology and Environmental Health, Part A*, 2014)

**NCRAR is studying a treatment for tinnitus called transcranial magnetic stimulation (TMS).** In TMS, clinicians hold a magnetic coil, usually in the form of a figure eight, against the skull. The coil emits pulses that reach the brain cells under the scalp and change their activity pattern. This may help reduce the abnormal perception of sounds. (*VA Research Currents*, February 3, 2014)

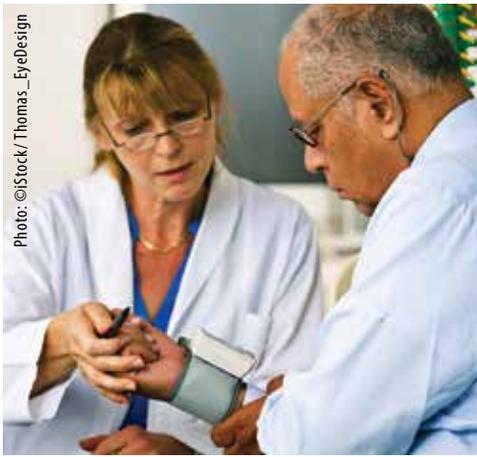
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*Though almost everyone with hearing loss can be helped by hearing aids, only about 1 in 5 uses them.*

*Hearing loss and tinnitus together are the most common service-connected disability among American Veterans.*

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# HEPATITIS C

*Hepatitis C is an infectious disease mainly affecting the liver, caused by the hepatitis C virus (HCV). HCV is spread through contact with infected blood or contaminated IV needles, razors, tattoo tools, or other items.*

## ABOUT HEPATITIS C

- About 4 million people in the United States are thought to have chronic hepatitis C, making it the most common infection in the blood in the nation. Hepatitis C is particularly common in Veterans, especially those who have been receiving blood transfusions for decades.
- Most people with hepatitis C do not have any signs or symptoms of the disease for decades. The most common symptoms are vague stomach discomfort, fatigue, and joint pain.
- More than half of people with hepatitis C will never have any health problems from it. The disease generally develops slowly, over the course of 10 to 40 years.
- By the time hepatitis C is diagnosed, there can be significant damage to the liver, leading to complications such as cirrhosis (scarring of the liver) and liver cancer. Sometimes, the disease results in death.
- Using drugs to fight HCV can be effective, but it can take a year of treatment before the body completely gets rid of the virus. The medications can cause tiredness, depression, anemia, and skin rashes—although a new treatment may be able to rid the virus from the body in three months.

## VA RESEARCH ON HEPATITIS C: OVERVIEW

- About [5 percent](#) of Veterans treated in the VA health care system have hepatitis C, compared with 2 percent of Americans on the whole.
- VA research on hepatitis C includes trials of new treatments, investigations of how infection takes place, and studies on how to make it easier for Veterans to get treatment.
- VA operates four hepatitis C resource centers throughout the nation, in [Minneapolis](#); [San Francisco](#); [West Haven, Conn.](#); and [Portland, Ore.](#) The centers are working to develop improved screening and testing methods for hepatitis C.
- VA has an ongoing [HIV/Hepatitis Quality Enhancement Research Initiative \(QUERI\)](#), whose mission is to help VA doctors and nurses ensure prompt detection of hepatitis C and HIV (the virus that causes AIDS) in their patients, and to offer them state-of-the-art care.

## SELECTED MILESTONES AND MAJOR EVENTS

- 1989** – Hepatitis C virus is first identified
- 1998** – VA HIV/Hepatitis QUERI started

**1999** – VA establishes first centers of excellence in hepatitis C treatment and research

**1999** – VA issues guidelines to all facilities for screening, counseling, and drug therapies for hepatitis C

**2013** – VA researchers determine that patients with both anemia and the HCV virus can benefit from intensive treatment for the virus

## RECENT STUDIES: SELECTED HIGHLIGHTS

- **VA researchers in Palo Alto looked at all Veterans with HCV** who were treated at VA medical centers in 2007 and 2008. After four weeks of treatment, some of these patients had such low levels of HCV that blood tests could not find the virus at all, and investigators examined those patients' records to identify predictors of such dramatic treatment success. The team found that those who had lower levels of the virus before they began to be treated were most likely to have undetectable levels after four weeks of therapy. ([Alimentary Pharmacology & Therapeutics](#), January 2012)
- **A team with VA and the University of California, San Francisco**, found that people with hepatitis C who do not

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respond to treatment with a protein called interferon have a higher risk of developing scarred livers than other patients. However, survival rates were the same for those who did not respond to interferon treatment as those who got no treatment at all. ([PLoS One](#), April 25, 2013)

• **Patients with HCV receiving interferon therapy show more psychiatric symptoms**, including depression, anxiety, fatigue, and pain, than those who do not get the protein, according to investigators from the Portland VA Medical Center and the Oregon Health Sciences University. However, these symptoms are generally short-term and go away once the treatments are completed. ([Journal of Psychosomatic Research](#), August 7, 2014)

• **Veterans with HCV who have anemia (a deficiency of red blood cells or hemoglobin) prior to treatment** can benefit from completing a full course of drug treatment for their hepatitis C. Such treatment can significantly reduce their risk of dying, according to investigators from the Pittsburgh VA Medical Center and the University of Pittsburgh. ([Clinical Gastroenterology and Hepatology](#), June 2013)

• **Veterans who have both rheumatoid arthritis and HCV** report more severe arthritis symptoms, compared with arthritis-affected Veterans without HCV. Philadelphia VA Medical Center researchers found that Veterans with both diseases are more likely to be treated with a drug called prednisone for their arthritis and less likely to be treated with another drug called methotrexate, compared with those without the virus. It may be that different drug treatments may improve the health of those with both diseases. ([Arthritis Care & Research](#), September 3, 2014)

• **Researchers at the Washington, DC, VA Medical Center reviewed the records of 75 patients with HCV or HIV** who underwent heart surgery between 1999 and 2011, and compared them with others who underwent heart surgery during the same period. They found that patients with chronic HCV infections tended to have a poorer survival rate after heart surgery than uninfected patients and patients with the AIDS virus. ([Journal of Cardiovascular Surgery-Torino](#), October 16, 2014, epub ahead of print)

• **African American Veterans are more likely than white Veterans to have hepatitis C**, but are also less likely to receive treatment. A study by researchers at the Seattle VA aims to find out why. Researchers are recording and analyzing communications between patients and providers, and holding in-depth interviews with both patients and providers. ([VA Research Advances](#), 2012)

**For more information on VA studies on hepatitis C and other key topics relating to Veterans' health, please visit [www.research.va.gov/topics](http://www.research.va.gov/topics)**

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## HOMELESSNESS

*Being homeless, or being at risk for homelessness, is one of the toughest problems any Veteran can face. VA has made ending Veterans' homelessness a top priority.*

### ABOUT HOMELESSNESS AMONG VETERANS

- In 2013, the Department of Housing and Urban Development estimated that 57,849 Veterans were homeless on a single night in January in the United States. This is 8 percent less than in 2012, and 24 percent less than in 2010.
- Veterans are at higher risk of 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.
- VA's [Domiciliary Care for Homeless Veterans](#) program has been providing medical services to homeless Veterans since the close of the Civil War.
- VA's [Health Care for Homeless Veterans](#) program offers examinations, treatment, referrals, and other help to homeless Veterans at more than 135 locations.
- VA's [Homeless Veterans Dental Program](#) provides dental treatment for eligible homeless Veterans.
- 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 do not have secure housing.

### VA RESEARCH ON HOMELESSNESS: OVERVIEW

- Why Veterans become homeless, what puts Veterans at risk of becoming homeless, and how to keep Veterans from becoming homeless are all issues being studied by VA researchers.
- Ways to improve homeless Veterans' health and to help and train those who work with the homeless are priorities of VA investigators.
- VA's Northeast Program Evaluation Center, based in West Haven, Conn., has looked at many homeless Veterans' health issues, but focuses on mental health conditions such as PTSD and substance abuse.
- VA's [National Center on Homelessness Among Veterans](#) works to help Veterans who are homeless or at risk of becoming homeless by developing and helping others adopt helpful policies, programs, and best practices.

### SELECTED MILESTONES AND MAJOR EVENTS

- 1866** – First National Home for Disabled Volunteer Soldiers opened in Togus, Maine
- 1987** – VA begins special programs for homeless Veterans

**2009** - VA establishes the [National Center on Homelessness Among Veterans](#) (NCHAV)

**2011** – VA adopts a policy of "Housing First," allowing people who are homeless to enter into stable housing before achieving sobriety or getting their mental health symptoms under control

**2012** – VA establishes first Homeless Patient Aligned Care Teams (H-PACT) to provide a "medical home" for homeless Veterans.

### RECENT STUDIES: SELECTED HIGHLIGHTS

- **VA researchers in Birmingham, Ala., developed a survey to help identify the specific challenges** homeless primary care patients present and to find ways to address those issues. The questionnaire asks homeless patients about their health care experiences, about the services they get, and whether or not they got help for their specific needs. The surveys help VA to better meet the health care needs of homeless Veterans. ([Medical Care](#), August 2014)
- **In 2011, VA began adopting the Housing First mode of care**, which allows people who have not yet achieved sobriety or are still having mental health problems to receive permanent housing through

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government-funded rental vouchers. Researchers from the Birmingham VA Medical Center and their colleagues found that 80 to 90 percent of Veterans housed in this program were able to remain in that housing, keeping them out of hospitals or prison or both.

([Psychiatric Services](#), May 1, 2014)

• **In a study of 115 homeless Veterans, researchers from VA's National Center for PTSD** found that 82 percent had experienced violence as adults, and 62 percent had experienced it as children. In addition, 53 percent experienced highly stressful events during their service in the military. ([Military Medicine](#), September 2013)

• **National Center for PTSD researchers looked at more than 26,000 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 in service. Those numbers are higher than that of the general Veteran population. ([Journal of General Internal Medicine](#), July 2013)

• **Researchers from the New England VA Mental Illness, Research, Education and Clinical Center (MIRECC)** found that homelessness among Veterans was associated with

childhood problems such as abuse and family instability. The researchers found that about half of the formerly homeless Veterans they studied reported instability in their families, and 40 percent reported that they had been abused as children. Overall, this sample of Veterans had a higher level of childhood problems compared with previously studied populations of non-homeless Veterans. ([Social Psychiatry and Psychiatric Epidemiology](#), March 2013)

• **New England MIRECC researchers conducted a study that suggested having been in prison was not a major barrier to overcoming homelessness later on.** The team studied 14,557 Veterans who were part of the Housing and Urban Development-Veterans Affairs Supportive Housing program during 2008 and 2009, 65 percent of whom had been in prison in the past. Overall, the researchers found that a history of incarceration did not affect progressing through the program and eventually obtaining housing. ([Community Mental Health Journal](#), July 2014)

• **VA's eHealth Quality Enhancement Research Initiative** surveyed 106 homeless Veterans and found that 89 percent of them had a mobile phone and 76 percent of them used

the Internet. Nearly all of the homeless Veterans were interested in getting mobile phone reminders about their medical appointments. Also, 88 percent wanted to be asked by mobile phone if they would like to schedule an appointment when it was time to do so. ([Telemedicine Journal and e-Health](#), September 2014)

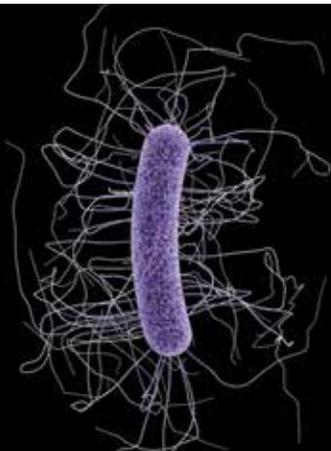
• **Within the overall population of homeless Veterans, the number of homeless Veterans above age 55 is growing.** VA researchers have found that while it takes about the same amount of time to place these Veterans in supported housing as it does younger Veterans, older Veterans have more medical problems, and are especially vulnerable to health problems resulting from their homelessness. ([Psychiatric Services](#), October 15, 2014, epub ahead of print)

**For more information on VA studies on homelessness and other key topics relating to Veterans' health, please visit [www.research.va.gov/topics](http://www.research.va.gov/topics)**

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*Veterans are at higher risk of homelessness than the general population. The risk of becoming homeless is particularly high in Veterans who live in poverty.*

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## INFECTIOUS DISEASES

*Infectious diseases are caused by organisms such as bacteria, viruses, fungi, or parasites. While many of these organisms live in and on humans, and are normally harmless or even helpful, some can cause disease under certain conditions.*

### ABOUT INFECTIOUS DISEASES

- Infectious diseases are generally classified according to the source of the infection. Some infectious diseases can be passed from person to person; others are transmitted from insect or animal bites, or by ingesting contaminated food or water or other environmental exposures.
- Tuberculosis (TB) is a bacterial disease that is spread through the air from one person to another. It can be fatal if not treated properly.
- Methicillin-resistant *Staphylococcus aureus* (MRSA) is a type of bacteria that is resistant to certain antibiotics. MRSA is a dangerous infection, difficult to eradicate, that can cause pneumonia or infect wounds and the bloodstream.
- Human immunodeficiency virus (HIV) is the chronic, progressive disease that leads to Acquired Immune Deficiency Syndrome (AIDS). More than 25 million people have died of AIDS worldwide.

### VA RESEARCH ON INFECTIOUS DISEASES: OVERVIEW

- VA researchers are advancing the understanding, prevention, and treatment of many infectious diseases, ranging from the common cold to major public health

threats such as AIDS, hepatitis C, and influenza.

- Infectious diseases that may endanger American troops serving abroad, such as malaria and leishmaniasis, are among the topics VA researchers are studying.
- A number of effective new strategies, vaccines, and drugs to prevent infectious diseases have been developed by VA investigators.
- One of the earliest contributions made by VA researchers to medical science was the establishment of effective treatments for TB.

### SELECTED MILESTONES AND MAJOR EVENTS

**1946** – Developed and tested effective therapies for TB through clinical trials that led to the development of the VA Cooperative Studies Program

**2005** – Showed the effectiveness of a new vaccine for shingles, a painful skin and nerve infection that affects older adults

**2011** – Showed that copper surfaces in hospital rooms could kill germs and prevent hospital-acquired infections

**2011** – Demonstrated that a VA initiative to control MRSA infections resulted in a

60 percent or greater decrease in those infections

### RECENT STUDIES: SELECTED HIGHLIGHTS

- **Shingles, or herpes zoster, is marked by a painful, blistering rash,** and can affect anyone who had chickenpox when they were young. VA researchers and their colleagues showed that a vaccine called Zostervax had no serious side effects and protected older adults over 60 from shingles. ([New England Journal of Medicine](#), June 2, 2005)
- **An international study that included six VA sites found that patients who are infected with TB but have no symptoms and are not contagious** can keep the disease from developing by taking a combination of drugs once a week for three months. The new combination appears to work just as well as the previous drug therapy, which called for taking one of the drugs in the combination every day for nine months. ([New England Journal of Medicine](#), December 8, 2011)
- **Malaria is a threat to American soldiers deployed to certain areas, including Afghanistan.** Researchers at the Portland VA medical center have identified a new drug that may be able to treat, prevent, and ultimately get rid of malaria in

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humans. The drug, called ELQ-300, appears to work in a single low dose that is given by mouth. At present, ELQ-300 has only been tested on mice; however, the first trials in humans are expected to start soon. ([Science Translational Medicine](#), March 20, 2013)

• **Researchers at the Hines (Ill.) VA and Northwestern University** found that offering flu vaccinations to patients aged 50 or older in hospital emergency rooms is a very cost-effective expenditure of funds. Limiting vaccinations to those older than 64 was even more cost-effective. ([American Journal of Emergency Medicine](#), September 2012)

• **About 10 percent of all patients admitted to VA hospitals with pneumonia** who were aged 65 or older experienced congestive heart failure within 90 days of admission, found a large database study based at the VA South Texas Health Care System. Another 1.5 percent had a heart attack. Most of these events occurred while patients were in the hospital. This suggests that heart problems may be a principal reason for death following the onset

of pneumonia in older people. ([The American Journal of Medicine](#), March 2011)

• **Researchers looking at the records of older patients hospitalized with pneumonia** found that treatment that included the antibiotic azithromycin (Zithromax), compared with other antibiotics, was associated with a significantly lower risk of death and a slightly higher risk of heart attack. The researchers concluded that there was a net benefit associated with azithromycin use in patients hospitalized for pneumonia. ([Journal of the American Medical Association](#), June 4, 2014)

• **VA researchers and their colleagues found that infections acquired in hospitals** are less likely to happen when acute-care patients are bathed every day with a simple, inexpensive antiseptic called chlorhexidine. Daily antiseptic baths reduced both bloodstream infections and the rate of acquiring multi-drug resistant organisms such as MRSA—and the benefits of the baths increased the longer patients stayed on intensive care units. ([New England Journal of Medicine](#), February 7, 2013)

• **A study found that replacing all surfaces in intensive care hospital rooms**, including bed rails, tray tables, and nurse call buttons, with copper cut the amount of bacteria in the rooms by 97 percent, and also resulted in a 41 percent drop in the rate of hospital-acquired infections. The work took place at the Charleston VA Medical Center, Medical University of South Carolina, and Sloan Kettering Cancer Center in New York. ([Infection Control and Hospital Epidemiology](#), May 2013)

**For more information on VA studies on infectious diseases and other key topics relating to Veterans' health, please visit [www.research.va.gov/topics](http://www.research.va.gov/topics)**

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*VA researchers are advancing the understanding, prevention, and treatment of numerous infectious diseases, ranging from the common cold to major public health threats such as AIDS, hepatitis C, and influenza.*

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## KIDNEY DISEASE

*Kidney disease kills 90,000 Americans every year—more than cancers of the breast and prostate combined.*

### ABOUT KIDNEY DISEASE

- The kidneys are a pair of fist-sized organs located on either side of the spinal column that perform life-sustaining functions to keep the rest of the body in balance.
- Kidney dialysis is a procedure that replaces some of the kidneys' normal functions and is performed when a person's own kidneys can no longer function well enough to keep them alive.
- There are many causes of chronic kidney disease, but the two main causes are diabetes and high blood pressure.
- Kidney disease shows few early symptoms, and most people are unaware of their declining kidney function until the disease is advanced.

- Some forms of kidney failure are temporary and may get better. This is called acute kidney failure. Chronic or end-stage kidney failure is the result of a scarring process that cannot be reversed, and results in the shutdown of the kidneys.

### VA RESEARCH ON KIDNEY DISEASE: OVERVIEW

- In 2013, [nearly 14,000 Veterans](#) received dialysis paid for by VA, representing an annual increase of 13 percent since 2008.

- VA research tries to keep people from developing chronic kidney disease, and to improve the way the disease is treated.

- While on the staff of the Denver VA Medical Center and the faculty of the University of Colorado Hospital, Dr. [Thomas E. Starzl](#) conducted the first long-term successful kidney transplant.

- In 2012, VA and the University of Michigan began creating a national kidney disease registry to monitor kidney disease among Veterans.

### SELECTED MILESTONES AND MAJOR EVENTS

**1962** – The first long-term successful kidney transplant is conducted at the Denver VA Medical Center

**2007** – A large VA trial finds that taking folic acid and other B vitamins every day does not reduce the death rates in patients with chronic kidney disease

**2008** – Giving dialysis six times a week to critically ill Veterans with acute kidney injury is found to be no better than doing so three times a week

**2012** – A national kidney disease registry is established to monitor kidney disease among Veterans

### RECENT STUDIES: SELECTED HIGHLIGHTS

- **A VA cooperative study completed in 2007 found that patients with end-stage kidney disease** who took high doses of folic acid and other B vitamins did not live longer or have fewer heart problems than those who did not receive those vitamins. ([Journal of the American Medical Association](#), September 12, 2007)

- **Acute kidney injury (AKI) is a sudden loss of kidney function that develops within 48 hours.** AKI can be caused by disease, some antibiotics, injuries, or other issues. A VA and National Institutes of Health research team found that undergoing dialysis six times a week was not any better for critically ill patients with AKI than undergoing the treatment three times a week. ([New England Journal of Medicine](#), July 3, 2008)

- **A protein called cystatin C helps doctors find out how well their patients' kidneys are working.** As kidney function gets worse, the levels of the protein in blood go up. Minneapolis VA researchers and colleagues found that people with very high levels of cystatin C in their blood were also more likely to break a hip than those with low levels. ([Journal of Bone and Mineral Research](#), June 2013)

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• **The drug enalapril reduces the risks of hospitalization and death** in people with kidney disease who also have heart failure, according to investigators at the Birmingham, Ala. VA Medical Center. Enalapril also helped heart failure patients who did not have kidney disease. ([International Journal of Cardiology](#), July 15, 2013)

• **AMP-activated protein kinase (AMPK) is an enzyme** that senses how much energy a cell has. Researchers with VA and the University of California, San Diego, found that AMPK can reverse kidney damage in rodents in the early stages of kidney disease. The researchers noted, however, that if this approach works on humans, it would work only on kidney disease that is not a complication of diabetes. ([American Journal of Physiology Renal Physiology](#), September 1, 2013)

• **A study by researchers at the VA Palo Alto Health Care System** and Stanford University found that patients who took part in a screening and education program for kidney disease before being diagnosed with the

disease were better prepared to live with the disease and had significantly lower death rates than those who had not taken part in the program. ([Kidney International](#), March 2014)

• **An angiogram is an X-ray image of the blood vessels.** A special dye used in some angiograms to allow doctors to visualize blocked blood vessels can cause problems in some people, including those with chronic kidney disease. A VA cooperative study is comparing the effectiveness of three different drugs and a placebo, to see which of these medications, if any, may be able to reduce the risk of these complications. ([VA Cooperative Study #578](#), Prevention of Serious Events Following Angiography)

• **VA researchers are assessing a new therapy** that may decrease the progression of diabetic kidney disease. The therapy uses two different drugs that block the renin angiotensin system, which regulates blood pressure. The investigators will assess the effect of this drug combination on the progression of kidney disease in patients with diabetes.

([VA Cooperative Study #565](#), VA NEPHRON-D: Diabetes in Nephropathy Study)

**For more information on VA studies on kidney disease and other key topics relating to Veterans' health, please visit [www.research.va.gov/topics](http://www.research.va.gov/topics)**

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## MENTAL HEALTH

*Mental health conditions, such as depression and anxiety, are common in the United States. More than 25 percent of Americans suffer from a mental disorder in any given year.*

### ABOUT MENTAL HEALTH

- Nearly 40 percent of Iraq and Afghanistan Veterans enrolled to receive VA health care have at least one mental health diagnosis, according to a 2009 VA [study](#). Posttraumatic stress disorder (PTSD) was the most common diagnosis for Veterans, followed by depression.
- VA is the largest single provider of mental health care in the nation. In a recent year, VA provided specialty mental health services to 1.3 million Veterans, many with mental health issues related to their deployments to combat areas.
- An estimated 30,000 to 32,000 lives are lost to suicide each year in the United States, including those of Veterans. As part of its efforts to address this problem, VA has established a toll-free, confidential Veterans Crisis Line at 1-800-273-8255.

### VA RESEARCH ON MENTAL HEALTH: OVERVIEW

- VA researchers are looking at potential ways to treat and prevent mental health disorders. They are also looking at other issues including using the Internet and other technologies to help Veterans in rural areas get the best possible care.

- Among the areas in which VA researchers are focusing are mood disorders, such as depression; psychotic disorders, such as schizophrenia; PTSD and other anxiety conditions; and substance use disorders.
- VA investigators are looking at the way mental health issues and physical disorders often occur together—for instance, depression in those with spinal cord injury, or substance abuse in patients with chronic pain.
- VA's 15 [Mental Illness Research, Education, and Clinical Centers](#) (MIRECCs) were established by Congress to research the causes and treatments of mental disorders, and to help doctors and nurses use the information VA researchers have found.

### SELECTED MILESTONES AND MAJOR EVENTS

- 1941** – A research lab is set up at the Northport, N.Y., VA Medical Center to conduct clinical and biomedical research in neuropsychiatric disorders
- 1997** – VA researchers identify a gene associated with schizophrenia risk
- 2003** – Researchers determine that costly new schizophrenia drugs may be no more effective than older, less expensive treatments

**2009** – One of the largest studies to date on the genetics of schizophrenia and bipolar disorder, involving 38,000 Veterans at more than 20 VA sites, is launched

**2013** – VA researchers find that many Veterans in the Boston area with PTSD were reminded of their own traumas, or had other emotional distress, in the week following the Boston Marathon bombing

### RECENT STUDIES: SELECTED HIGHLIGHTS

- **A home electronic messaging program substantially lowered the number of emergency room visits and hospitalizations in people with mental health issues such as depression, schizophrenia, PTSD, and substance use disorders, according to investigators from VA's National Telemental Health Center in West Haven, Conn. Daily messages were sent to patients through devices connected to their home telephones.** ([Journal of Telemedicine and Telecare](#), January 2012)
- **Anxiety is a normal biological reaction to a stressful event.** In some cases, however, anxiety continues for a long period and may get worse over time. In a recent international study of people with generalized anxiety disorder,

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including Veterans, the drug quetiapine (known commercially as Seroquel) was able to dramatically reduce their symptoms. ([International Clinical Psychopharmacology](#), January 2011)

• **A study of brain activity in special operations forces** showed how they manage to keep their cool and perform well under pressure. The study used brain scans to examine brain activity in Navy SEALs and in other healthy men. During tasks performed as part of the study, the SEALs showed more activity in parts of the brain linked to control of the emotions. They also had less worry about what would happen in the next moment. ([NeuroReport](#), March 7, 2012)

• **VA researchers, along with their international colleagues**, have found differences in brain samples of people with and without schizophrenia. (The brain samples were taken after their deaths.) This means that people with schizophrenia have genetic differences that are reflected in their brain tissue. ([Archives of General Psychiatry](#), January 2012)

• **Many Boston-area military Veterans diagnosed with PTSD experienced flashbacks**, unwanted memories, and other psychological problems as a result

of the Boston Marathon bombing in April 2013. A study led by researchers at VA’s National Center for PTSD and Boston University found that 38 percent of the Veterans they contacted within a week of the bombing were “emotionally distressed” by the bombing and the subsequent lockdown of Boston and other communities. ([Journal of Traumatic Stress](#), December 2013)

• **An international study, including VA researchers, has identified 108 genetic locations where the DNA of people with schizophrenia** tends to differ from those without the disease. (DNA is the material that carries genetic information in humans.) This is the first detailed picture of the genes and gene groups that increase the risk of schizophrenia, and the study may eventually be used to diagnose and treat the disease. ([Nature](#), July 24, 2014)

• **A study of nearly 7,000 men aged 50 or older found that Veterans were no more likely than non-Veterans to have depression or anxiety.** Although Veterans, especially those who served in combat, generally experience more stress and trauma than non-Veterans, older Veterans actually had lower

levels of depression and anxiety than non-Veterans in the same age group. ([International Journal of Geriatric Psychiatry](#), August 22, 2014, epub ahead of print)

**For more information on VA studies on mental health and other key topics relating to Veterans’ health, please visit [www.research.va.gov/topics](http://www.research.va.gov/topics)**

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## OBESITY

*More than 35 percent of American adults are obese, and about 17 percent of children are obese—about 78 million adults and 12.5 million children.*

### ABOUT OBESITY

- Overweight and obesity are terms used for ranges of weight that are greater than what is considered healthy.
- Obesity is a risk factor for heart disease, stroke, and some types of cancer. A large waistline, high triglyceride levels, low HDL (good) cholesterol levels, high blood pressure, and high fasting blood sugar all increase the likelihood of developing these diseases.
- Obesity rates for adults with disabilities are about [57 percent higher](#) than for adults without disabilities.
- Diabetes and obesity are very often found together, especially type 2 diabetes (once known as adult-onset or non-insulin-dependent diabetes).

### VA RESEARCH ON OBESITY: OVERVIEW

- [More than 7 in 10 Veterans](#) who receive VA care are overweight, and nearly 4 in 10 are obese.
- VA research on obesity looks at the biological processes of weight gain and weight loss.

- VA investigators also compare the safety and effectiveness of obesity treatments and seek ways to help Veterans keep from gaining weight—for example, through programs promoting exercise and healthy eating.
- VA's [MOVE!](#) is a national weight-management and exercise program designed and coordinated by [VA's National Center for Health Promotion and Disease Prevention](#).

### SELECTED MILESTONES AND MAJOR EVENTS

- 2002** – VA researchers produce key findings on ghrelin, a “hunger hormone” that may be the signal that makes people feel like eating
- 2006** – VA MOVE! program implemented nationally
- 2012** – A VA study finds that the cost of caring for surgical patients in the VA system three years after bariatric (weight-loss) surgery is similar to the cost of caring for obese Veterans who did not have the surgery
- 2013** – VA researchers tie PTSD and depression to weight gain in Iraq and Afghanistan Veterans

### RECENT STUDIES: SELECTED HIGHLIGHTS

- **Gastric banding, a type of bariatric surgery, nearly always improves or eliminates diabetes symptoms**, according to researchers from the VA San Diego Healthcare System. Before the banding, Veterans in the study all required daily medication for their diabetes. After two years, 48.5 percent had no symptoms of diabetes. Another 47 percent saw their symptoms improve, and only 4.5 percent saw no change in their diabetes status. ([Postgraduate Medicine](#), November 2012)
- **Exercise and nutrition classes are helpful even when those in the class are at remote locations.** Half of the Veterans in a study at the Sioux Falls, S.D., VA Medical Center took part in a series of weekly MOVE! classes by watching them on TV. The MOVE! participants lost an average of 12 pounds, while a control group, which took neither video or in-person classes, gained weight. ([Journal of Rural Health](#), Winter 2014)
- **Veterans with posttraumatic stress disorder (PTSD) or other mental conditions who used the MOVE! program** lost significantly less weight than those with no mental health diagnoses,

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according to researchers at VA's Ann Arbor Medical Center. The investigators suggest that MOVE! may need to be adapted to help Veterans with mental health conditions, especially PTSD. ([Psychiatric Services](#), August 15, 2014)

• **A search of VA's electronic health records system and other data** found that the department's costs to treat surgical patients three years after bariatric surgery was similar to its costs to treat Veterans who did not have this kind of surgery. The authors of the study, from VA's Center for Health Services Research in Primary Care in Durham, N.C., believe that despite the costs, bariatric surgery is still a valuable option for treating extremely obese patients because of the undeniable health benefits of the surgery. ([Archives of Surgery](#), July 2012)

• **Personal digital assistants (PDA) can help Veterans lose weight**, according to researchers at the Hines VA Medical Center in Illinois. Half of the Veterans in a study were given a PDA on

which they recorded their food intake, physical activity, weight, mood, and pain intensity. This group also received telephone support every other week for six months. Weight loss among the group using PDAs was greater than those who did not at three months, six months, nine months, and a year. ([JAMA Internal Medicine](#), January 28, 2013)

• **High rates of overweight and obesity were found among a relatively young group of Iraq and Afghanistan Veterans** by researchers at the San Francisco VA Medical Center. The investigators found that 75 percent of Iraq and Afghanistan Veterans were either overweight or obese at their first encounter with VA health care. Obesity rates were highest among those with PTSD or depression. ([Journal of General Internal Medicine](#), July 2013)

• **Regular 30-minute phone calls from a trainer can result in significant weight loss for disabled persons**, according to researchers with the Jesse Brown VA Medical Center in Chicago and the

University of Alabama at Birmingham. The researchers developed a program for people with physical disabilities and found that those who received the program along with phone coaching lost weight, but those who got the program without the regular phone calls did not. ([American Journal of Physical Medicine & Rehabilitation](#), December 2013)

**For more information on VA studies on obesity and other key topics relating to Veterans' health, please visit [www.research.va.gov/topics](http://www.research.va.gov/topics)**

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*More than 7 in 10 Veterans who receive VA care are overweight, and nearly 4 in 10 are obese.*

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## PAIN MANAGEMENT

*Pain is one of the most common reasons Americans consult a physician, and it is the most common symptom Iraq and Afghanistan Veterans mention when they first visit VA for care.*

### ABOUT PAIN MANAGEMENT

- [Around 100 million](#) Americans have chronic or persistent pain.
- The annual cost of chronic pain in the United States is estimated at around [\\$600 billion](#), including health care expenses and lost productivity.
- Back pain is the leading cause of disability in Americans under 45 years of age.
- Unrelieved and persistent chronic pain contributes to depression, anxiety, poor sleep, and decreased quality of life.
- About [44 percent](#) of soldiers in an Army infantry brigade reported chronic pain even three months after their tour in Afghanistan or Iraq, nearly double the rate among civilians.

### VA RESEARCH ON PAIN MANAGEMENT: OVERVIEW

- VA is working to develop new ways to lessen Veterans' pain, which may result from spinal cord injury, burns, amputations, traumatic brain injury, cancer, arthritis, or other conditions. Some types of chronic pain, such as the nerve pain many people with spinal cord injury have, are quite hard to treat.

- VA's stepped care model for pain management is designed to help Veterans by making sure VA doctors and nurses are fully trained in ways to manage pain; that pain assessments are done in the same way throughout VA; and that Veterans get quick and appropriate pain treatment.
- Complementary and alternative medicine is often used in VA to treat back pain, headache, arthritis, and fibromyalgia (long-term pain throughout the body). VA researchers are conducting studies to determine which CAM therapies are truly helpful, and for which conditions and groups of people they work.
- VA's [Chronic Pain Rehabilitation Program](#), established in 1988 and located in Tampa, Fla., is a nationally known center for chronic pain research, treatment, and education.

- The [Pain Management and Patient Aligned Care CREATE](#) has three goals: to improving Veterans' access to evidence-based pain care; using health information technology to improve care; and building sustainable, long-term improvements in pain care.
- VA's [Pain, Research, Informatics, Medical Comorbidities, and Education \(PRIME\) Center](#), part of the VA Connecticut

Healthcare System, conducts research to improve pain care and sponsors educational activities for Veterans and clinical staff.

### SELECTED MILESTONES AND MAJOR EVENTS

- 1988** – The Chronic Pain Rehabilitation Program is established to help Veterans cope with chronic pain
- 1998** – The National Pain Management Strategy, making pain management a national VA priority, is disseminated
- 2003** – All VA facilities begin systematic pain screenings
- 2009** – The stepped care model for pain management is established as VA's standard of pain care
- 2014** – VA and the National Institutes of Health announce a five-year quality improvement initiative to explore nondrug approaches to managing pain

### RECENT STUDIES: SELECTED HIGHLIGHTS

- **Pain and depression increase each other**, and 30 to 50 percent of Veterans with one condition also have the other, according to researchers at the

*(Continued on back)*



Indianapolis VA Medical Center. The two conditions need to be managed together, especially when treatment focused on either one is not working well. ([The Journal of Pain](#), September 2011)

• **Women Veterans with chronic low back pain can see improvements in their pain and energy levels** and in their overall mental health from participating in yoga. A study at the VA San Diego Healthcare System looked at women before and after they took part in 10 weeks of yoga practice in classes and at home. Women in the study showed greater improvements than men who had completed a similar program. ([Journal of Alternative and Complementary Medicine](#), September 2012)

• **Veterans with chronic back pain were given a pedometer** and the ability to upload its data to researchers at the Ann Arbor VA Medical Center. About half of the Veterans also had access to a website that provided automated walking goals, feedback, motivational messages, and social support. This group reported significantly less back pain than the pedometer-only group after six months. However, after 12 months, there were

no differences between the groups. ([Journal of Medical Internet Research](#), August 2013)

• **Vitamin D supplements can reduce pain and improve sleep**, according to Atlanta VA Medical Center investigators. Veterans who had chronic pain and low blood vitamin D levels took vitamin D supplements for over a year. Their pain decreased, the quality and amount of their sleep increased, and their general health and ability to function in social situations also increased. ([The Clinical Journal of Pain](#), April 2013)

• **African Americans are less likely than whites to receive adequate pain treatment for all types of pain**, according to previous studies. VA researchers found that VA's requirement that all patients be screened for the presence and intensity of pain has resulted in high and relatively equal rates of pain assessment among African American and white Veterans. ([The Clinical Journal of Pain](#), February 2013)

• **Researchers at the VA Connecticut Healthcare System have found that as a result of VA's stepped care model of pain management**, the proportion of VA patients receiving high doses of opioids (pain killing drugs like morphine

and codeine) decreased significantly over a four-year period, and the use of alternatives to opioids increased significantly. ([Journal of General Internal Medicine](#), October 30, 2014, epub ahead of print)

• **VA and the National Center for Complementary and Alternative Medicine have funded 13 research projects** at VA medical centers and at academic institutions throughout the U.S. to explore nondrug approaches to managing pain and related health conditions such as PTSD, drug abuse, and sleep issues. Studies funded under the \$21.7 million quality-improvement initiative will take up to five years to complete. ([National Institutes of Health news release](#), September 25, 2014)

**For more information on VA studies on pain management and other key topics relating to Veterans' health, please visit [www.research.va.gov/topics](http://www.research.va.gov/topics)**

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*The annual cost of chronic pain in the U.S. is estimated at \$600 billion, including health care expenses and lost productivity.*

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# PARKINSON'S DISEASE

*Parkinson's disease (PD) is a disease of the nervous system that is commonly referred to as a movement disorder. It is caused by a loss of dopamine-producing cells in the brain.*

## ABOUT PARKINSON'S DISEASE

- PD causes a variety of symptoms related to muscle movement, including rigidity, delayed movement, poor balance, and tremors.
- Symptoms of PD not related to movement include sleep disturbances, problems with urination, constipation, swallowing problems, mood disorders, and limitations to the ability to learn and function.
- PD affects as many as 1.5 million Americans, mostly people over age 50.
- There is no cure for PD, but many effective medications and treatment options are available.

## VA RESEARCH ON PARKINSON'S DISEASE: OVERVIEW

- VA estimates that about 80,000 Veterans have PD, and the department treats at least [40,000 Veterans](#) each year with the condition.
- VA has six specialized [centers](#), called Parkinson's Disease Research, Education, and Clinical Centers (PADRECCs), to help Veterans with PD.
- PADRECCs help Veterans manage PD and other movement disorders by providing clinical care, innovative research, and education programs for people with PD and their families.

- Researchers at PADRECCS and at other VA facilities are studying the reasons why dopamine-producing cells do not work properly in people with PD, and are testing a number of ways to treat PD, including medication, surgery, and electrical stimulation.

## SELECTED MILESTONES AND MAJOR EVENTS

- 2001** – PADRECCs are established at six sites nationwide
- 2009** – VA researchers find that deep brain stimulation (DBS) may hold significant benefits for those with PD who no longer respond well to medication alone
- 2010** – VA findings suggest the immune system is likely to have a role in developing PD
- 2012** – VA investigators find that patients with PD who undergo DBS can expect improvements in movement-related symptoms for at least three years

## RECENT STUDIES: SELECTED HIGHLIGHTS

- **In the first large scale trial of the results of DBS**, a surgical procedure that blocks abnormal nerve signals that cause tremors related to PD, VA researchers found patients who underwent DBS could control their arms and legs better and

could walk better than those just using medication. They also found older patients benefited as much from the surgery as younger patients did. The researchers concluded that while DBS was riskier than drug therapy, it might significantly help those with PD who don't respond well to medication alone. ([Journal of the American Medical Association](#), January 7, 2009)

- **Attempted suicide, or thoughts of suicide, were no more common among patients who had had DBS surgery** than those who did not, according to researchers at the Philadelphia VA PADRECC. Some previous studies had raised the question of whether suicide was an important cause of death after DBS procedures. ([Journal of Neurology, Neurosurgery, and Psychiatry](#), October 2013)
- **DBS produced marked improvements in movement in a study led by investigators at the Hines (Ill.) VA Medical Center.** On average, patients who had undergone DBS surgery gained four to five hours a day free of troubling symptoms such as shaking, slowed movement, and stiffness. The effects were greatest at six months after the surgery, and leveled off slightly after three years. ([Neurology](#), July 3, 2012)

- **The immune system probably plays a role in the development of PD**, according to researchers with the Puget Sound VA

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Medical Center and three universities who worked together on a study. The investigators found that a gene that is linked with the immune system is also strongly linked with PD. The findings suggest a possible new avenue of drug development for PD. ([Nature Genetics](#), September 2010)

• **Impaired sense of smell, constipation, slow reaction time, excessive sleepiness during the day,** and problems managing daily life tasks may all be warning signs of PD, according to a team of VA researchers at the Honolulu VA Medical Center. The study found that combinations of these signs could predict up to a tenfold higher risk of the disease. ([VA Research Currents](#), December-January 2012)

• **Low-intensity workouts, stretching, and resistance exercise all improve the movement of PD patients.** Those who walked on a treadmill at a comfortable pace for nearly an hour showed the most consistent improvement in their way of walking and their movement, according to

researchers at the Baltimore VA Medical Center. ([JAMA Neurology](#), February 2013)

• **Patients who walked briskly for 45 minutes three times a week showed improvement in their Parkinson's symptoms,** in a study by investigators at the Iowa City VA Health Care System and the University of Iowa. Even moderate walking made a big difference, and those who walked were less depressed and less tired than others with PD. ([Neurology](#), July 29, 2014)

• **Patients with PD, even those who were just diagnosed, had an "ocular tremor"** (the inability to maintain a stable fixed gaze) that was not seen in patients who did not have the disease, investigators at the Richmond VA Medical Center and Virginia Commonwealth University found. Only two of the healthy participants in the study had the same problem—and one of them went on to develop PD symptoms within two years. ([Archives of Neurology](#), August 2012) A follow-up study indicated that ocular tremors were not influenced by whether the

study subjects' heads were free or fixed. ([Parkinsonism and Related Disorders](#), July 2014)

**For more information on VA studies on Parkinson's disease and other key topics relating to Veterans' health, please visit [www.research.va.gov/topics](http://www.research.va.gov/topics)**

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*VA estimates that about 80,000 Veterans have PD, and the department treats at least 40,000 Veterans each year with the condition.*

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Photo: Sgt. Pete Thibodeau



## POSTTRAUMATIC STRESS DISORDER (PTSD)

*Investigators with the Department of Veterans Affairs (VA) are conducting cutting-edge research aimed at improving care for Veterans with PTSD.*

### 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.
- On average, about [14 percent](#) of Iraq and Afghanistan Veterans are estimated to have PTSD. This compares with a lifetime prevalence of about [10 to 12 percent](#) in Gulf War Veterans and around [30 percent](#) in Vietnam Veterans.
- Overall, nearly [7 percent](#) of U.S. adults will experience PTSD at some point in their lifetime. Women are about twice as likely as men to develop it.

### VA RESEARCH ON PTSD: OVERVIEW

- VA supports numerous studies aimed at understanding, treating, and preventing 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 and studies on complementary and alternative approaches, such as various forms of meditation.

- VA's [National Center for PTSD](#), with headquarters in Vermont and branches at several VA sites nationwide, is home to a great deal of VA research on PTSD.
- Many VA studies are conducted in collaboration with the Department of Defense (DoD) and involve Veterans as well as active duty Service members.

### SELECTED MILESTONES AND MAJOR EVENTS

- 1980** – PTSD is given a clinical name and a scientific definition
- 1989** – VA creates the [National Center for PTSD](#), headquartered in White River Junction, Vermont
- 2006** – A VA [study](#) shows wide benefits in the PTSD population for cognitive processing therapy, a form of psychotherapy initially developed to help victims of sexual trauma
- 2007** – VA researchers first [demonstrate](#) the benefits of prolonged exposure therapy as a treatment for PTSD in a clinical trial

**2007** – VA researchers [find](#) that prazosin, an inexpensive generic drug, can improve sleep and lessen trauma nightmares in Veterans with PTSD

**2011** – VA expands [funding](#) for studying complementary and alternative medicine to treat PTSD

**2012** – VA joins with DoD in funding \$100 million in new studies on TBI and PTSD, leading to the creation of two major research [consortia](#)

### RECENT STUDIES: SELECTED HIGHLIGHTS

- **A major VA cooperative study found no reduction in symptoms** among Veterans with chronic PTSD who received the drug risperidone as an add-on treatment. Those in the study had not responded to first-line drug treatment with antidepressants. ([Journal of the American Medical Association](#), August 3, 2011)
- **Using data from VA's Vietnam Era Twin Registry**, researchers from VA, Massachusetts General Hospital, and Tufts University identified the dorsal anterior cingulate as one of the brain areas that undergo changes in those with PTSD. ([American Journal of Psychiatry](#), September 2011)

*(Continued on back)*



- **Researchers from VA’s Palo Alto Health Care System and Stanford University** found that Iraq and Afghanistan Veterans diagnosed with PTSD have more physical ailments than Veterans without mental health conditions. In particular, women Veterans with PTSD were found to be more susceptible to physical health issues than their male counterparts. ([Journal of General Internal Medicine](#), January 2011)
- **VA and Duke University researchers found that recent combat veterans with PTSD** have less volume in the amygdala of their brains—an area involved in fear and anxiety. The study did not determine whether this difference is a result of trauma, or a preexisting risk marker for PTSD. ([Archives of General Psychiatry](#), November 2012)
- **Using a type of brain scan called magnetoencephalography,** VA researchers found a potential “biomarker of resilience,” which may help explain why some people who are exposed to trauma never develop PTSD. ([JAMA Psychiatry](#), April 2013)
- **Veterans with PTSD and alcohol dependence can be helped by the drug naltrexone,** according to a study

at the Philadelphia VA Medical Center and the University of Pennsylvania. The 165 participants received either naltrexone—which reduces alcohol withdrawal symptoms—or a placebo. They also received either supportive counseling or 18 sessions of prolonged exposure therapy. Comparing outcomes among the different study arms, the researchers determined that naltrexone helped stem problem drinking in the long term. ([Journal of the American Medical Association](#), August 7, 2013)

• **A VA study showed that using videoconferencing to provide psychotherapy to Veterans in remote locations** is less costly than in-person treatment. A study from the Honolulu VA had previously shown 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. ([Telemedicine Journal and E-health](#), October 2013)

• **VA researchers found lower levels of the norepinephrine transporter protein in people with PTSD,** versus healthy controls. The scientists used PET scans to determine levels of the protein in a part of the brain called the locus coeruleus, which helps activate

the body’s stress response. The finding could eventually play a role in new drug development. ([JAMA Psychiatry](#), November 2013)

• **Life and family stress during deployment can increase the risk for PTSD** by up to nine times in Veterans who were exposed to combat, according to a study from the Providence (R.I.) VA Medical Center. The research included 238 National Guard/Reserves members who completed surveys about four months post-deployment. ([Psychiatry Research](#), December 30, 2013)

• **Marine Resiliency Study researchers with VA and the Department of Defense** learned that traumatic brain injury during a deployment was by far the strongest predictor of PTSD symptoms in service members and Veterans, far more significant than prior TBIs or the intensity of combat they experienced. ([JAMA Psychiatry](#), February 2014)

**For more information on VA studies on PTSD and other key topics relating to Veterans’ health, please visit [www.research.va.gov/topics](http://www.research.va.gov/topics).**

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*VA supports numerous studies aimed at understanding, treating, and preventing PTSD.*

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Photo: dekareserach.com



## PROSTHETICS

*Providing state-of-the-art prosthetics care for Veterans is one of VA's top priorities. To help meet the lifestyle and medical needs of Veterans who have lost limbs, VA researchers develop and test a wide variety of prosthetic devices.*

### ABOUT PROSTHETICS

- In 1862, Congress appropriated \$15,000 for the purchase of artificial limbs for soldiers and seamen disabled in the service of the United States.
- After the end of the Civil War, the War Department was authorized to provide Union Veterans with transportation to and from their homes to a place where they could obtain their artificial limbs or devices, and to furnish those Veterans with new artificial limbs or devices every five years.
- Many of the estimated [6 percent](#) of wounded service members returning from Iraq and Afghanistan who have lost a limb receive prosthetics from VA, as do many other Veterans who required amputations because of diabetes and other disorders.
- Between 2001 and Sept. 1, 2014, 1,573 Service members experienced an amputation related to combat injuries incurred in OIF, OND, or OEF.

### VA RESEARCH ON PROSTHETICS: OVERVIEW

- VA researchers are developing improved materials and designs for prostheses. They are also trying to better meet the needs of Veterans by probing how different prosthetic devices are actually used by

those who need them, and how satisfied Veterans are with the technology.

- VA's [Center for Advanced Platform Technology](#), in Cleveland, develops new technologies to help Veterans who have lost limbs, among other disabilities.
- The [Center of Excellence in Functional Electrical Stimulation](#), also located in Cleveland, uses controlled electrical current to make paralyzed muscles work again.
- The [Center of Excellence in Wheelchairs and Associated Rehabilitation Engineering](#) in Pittsburgh works to improve the design of wheelchairs, seating systems, and other mobility technologies.
- The VA [Center of Excellence for Neurorestoration and Neurotechnology](#) in Providence, R.I. supports research and development on brain-computer interfaces for people with paralysis or limb loss. Researchers there also evaluate new prosthetic limbs, and develop new ways to help people regain function in their limbs.

### SELECTED MILESTONES AND MAJOR EVENTS

**1955** – The first VA Prosthetics Center is opened in New York City

**1964** – VA's [Journal of Rehabilitation Research and Development](#) begins publication as the *Bulletin of Prosthetic Research*

**2000** – VA researchers conduct the first large clinical trial of hearing aids, showing that the devices can help the hearing-impaired in both quiet and noisy environments

**2007** – Researchers with VA, MIT, and Brown University unveil the first powered ankle-foot prosthesis

**2011** – VA researchers show that brain implants that can help users control devices such as robotic arms continue to work effectively for at least 1,000 days

**2014** – FDA [approves](#) the DEKA arm, a high-tech prosthetic device tested by VA

### RECENT STUDIES: SELECTED HIGHLIGHTS

- A **“powered ankle-foot prosthesis,” which uses tendon-like springs and an electric motor** to move people forward, was developed through a collaboration among VA, MIT, Brown University, and other partners. Patients using the powered ankle-foot expend less energy while walking, have better balance, and walk 15 percent faster than those using

*(Continued on back)*



conventional prostheses. The device is now available in the VA and military health systems and commercially. ([Conference proceedings of the IEEE Engineering in Biology Society](#), 2007)

• **Implanting electrodes in the brains of study volunteers with paralysis** enabled them to control robotic arms with their thoughts. The research team, which included VA, Brown University, Harvard University, and Massachusetts General Hospital researchers, has also documented that those electrodes can continue to relay strong signals to an external decoder for up to at least 1,000 days after implantation. ([Journal of Neural Engineering](#), April 2011)

• **A new kind of computer interface that provides a prosthetic hand with a sense of touch** is being developed by researchers at the Cleveland VA Medical Center and Case Western Reserve University. The new hand gives a feeling of touch on the fingertips, palm and wrist, and on the back and side of the hand—and its sensors continue to work after 18 months. ([Cleveland Plain Dealer](#), December 27, 2013)

• **The ReWalk exoskeleton, worn outside a person’s clothes, provides powered hip and knee motion** that enables those with spinal cord injuries to stand upright and walk. Invented by an Israeli engineer, the system is being extensively studied at the James J. Peters VA Medical Center in the Bronx, N.Y. ([VA Research Currents](#), August 15, 2014)

• **The DEKA arm is a futuristic prosthetic arm whose wrist and fingers adjust into six different grips,** allowing users to perform a range of everyday tasks, including picking up a glass, holding a tube of toothpaste, and turning a key in a lock. The arm, approved for use by the FDA in May 2014, was funded by the Department of Defense, developed by DEKA Integrated Solutions Corporation, and rigorously tested in a four-year VA study. ([VA Research Currents](#), May 16, 2014)

• **While most people are able to match their shoes to any occasion,** from sneakers to high heels, prosthetic foot wearers have been unable to do so—until now. Researchers at the Minneapolis VA Health Care System and elsewhere have developed a new

Shape and Roll prosthetic foot that can accommodate a wide range of shoe heel heights, and allows people to change to shoes with different heel heights without having problems with their balance. ([Journal of Rehabilitation Research & Development](#), Volume 51 Number 5, 2014)

• **Osseointegration firmly anchors prosthetic limbs in place by integrating implanted material into living bone.** VA researchers in Salt Lake City are implanting specially designed and coated titanium sockets into the femurs (thigh bones) of amputees who have lost much of their leg. The bone of the remaining part of the limb should grow into the implant. After healing is complete, users have better control of their prosthetic leg and can avoid the discomfort—and, in some cases, pain—of a traditional socket design. ([oandp.com](#), July 26, 2012; [KSL-TV](#), May 17, 2013)

**For more information on VA studies on prosthetics and other key topics relating to Veterans’ health, please visit [www.research.va.gov/topics](http://www.research.va.gov/topics)**

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## RESPIRATORY HEALTH

*Human beings breathe about 25,000 times during a normal day. For the healthy, this is a simple process. For millions of people with respiratory problems, however, breathing is not easy.*

### ABOUT RESPIRATORY HEALTH

- Asthma is a chronic inflammation of the airways that causes periods of breathing problems. While asthma cannot be cured, its symptoms can be controlled.
- Chronic obstructive pulmonary disease (COPD) has symptoms including shortness of breath, coughing, and the production of a mixture of saliva and mucus called sputum. The disease is usually progressive and is associated with the lungs becoming inflamed by harmful particles and gases, such as cigarette smoke.
- Veterans may suffer from respiratory problems due to exposures to environmental triggers such as mold or air pollution; or due to infectious agents such as the germs that cause tuberculosis and pneumonia.
- The herbicide Agent Orange, used during the Vietnam War, is associated with respiratory cancers, among other illnesses.

### VA RESEARCH ON RESPIRATORY HEALTH: OVERVIEW

- Forty percent of VA's first patients in the 1920s had tuberculosis, a contagious bacterial infection that involves the lungs and may spread to other organs. VA researchers have made important contributions to treating this once often-

fatal disease.

- In the 1950s, a VA researcher found that the lungs of most smokers showed signs of lung cancer after their deaths, whether or not the illness was the reason they died. The researcher also found that heavy smokers were much more likely than nonsmokers to die of lung cancer.
- VA researchers developed the [nicotine patch](#). The patch transfers nicotine into the bloodstream to reduce cravings for the substance.
- Respiratory problems are the leading cause of death in Veterans and others who have spinal cord injury (SCI). VA's [Center of Excellence on the Medical Consequences of Spinal Cord Injury](#), in the Bronx, N.Y., is studying ways to treat these problems and other complications of SCI.

### SELECTED MILESTONES AND MAJOR EVENTS

- 1950** – A VA researcher concludes there is strong circumstantial evidence linking cigarette smoking with respiratory tract cancers
- 1956** – The first VA study is published linking cigarette smoking with growths that can lead to cancer

**1984** – Nicotine patch developed

**1994** – A link is established between respiratory cancers and exposure to herbicides such as Agent Orange

**2014** – VA's Airborne Hazards and Open Burn Pit Registry established

### RECENT STUDIES: SELECTED HIGHLIGHTS

- **About 10 percent of Veterans aged 65 or older who were admitted to VA hospitals with pneumonia** developed congestive heart failure within 90 days of their admission to the hospital, according to investigators with the South Texas Veterans Health Care System. About the same percentage experienced a problem with the rate or rhythm of their heartbeat. Another 1.5 percent had a heart attack. Most of these events occurred while patients were in the hospital. Researchers want to understand these trends, seen in VA and non-VA hospitals, so they can identify interventions. ([The American Journal of Medicine](#), March 2011)
- **Patients hospitalized with pneumonia who received treatment that included the antibiotic azithromycin** had a significantly lower risk of death and a slightly increased risk of heart attack,

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compared with those who received treatment with other antibiotics. Researchers from the VA North Texas Health Care System and the University of Texas concluded there is a net benefit to using azithromycin in patients with pneumonia. ([Journal of the American Medical Association](#), June 4, 2014)

**• An alteration in a common gene may help predict how well patients with lung cancer** respond to treatment. Researchers with the Atlanta VA Medical Center and Emory University found that patients with non-small lung cancer who had variations of the gene caveolin-1 tended to respond better to chemotherapy. They also tended to have higher survival rates. ([PLOS One](#), September 15, 2014)

**• Respiratory disorders are among a cluster of medically unexplained chronic symptoms** experienced by some Gulf War Veterans. Researchers from the Northport, N.Y., VA Medical Center found that 96 percent of Gulf War Veterans with chronic multisymptom illness had breathing problems while they slept, compared to only 36 percent of Gulf War Veterans without multisymptom illness. The investigators also found that continuous positive airway pressure (CPAP) can ease breathing and sleep problems in

these Veterans. ([Sleep and Breathing](#), September 2011)

**• Providing influenza (flu) shots for patients aged 50 or older in hospital emergency rooms** would cost hospitals approximately \$35,000 for every life the shots saved, a very cost-effective expenditure of funds. Researchers with the Hines VA Medical Center and Northwestern University also found that limiting flu shots to those older than 64 would cost hospitals only \$13,000 for every life such vaccinations saved. CDC recommends everyone six months or older—with rare exceptions—be vaccinated annually. ([American Journal of Emergency Medicine](#), September 2012)

**• Sleep apnea is a potentially serious sleep disorder, often associated with obesity**, in which breathing repeatedly stops and starts. According to researchers from the Philadelphia VA Medical Center and the University of Pennsylvania, losing weight does more to reduce heart disease risk factors in people with sleep apnea than CPAP therapy, which helps people with the disease breathe more easily during sleep. ([New England Journal of Medicine](#), June 12, 2014)

**• VA maintains the Airborne Hazards and Open Burn Pit Registry** for Iraq

and Afghanistan Veterans and Gulf War Veterans to report exposures to airborne hazards, such as smoke from burn pits, oil-well fires, or pollution during deployment, as well as other exposures and health concerns. Burn pits have been used widely at U.S. military bases in Iraq and Afghanistan to dispose of products such as chemicals, paint, medical and human waste, ammunition, and petroleum products. ([VA Office of Public Health website](#))

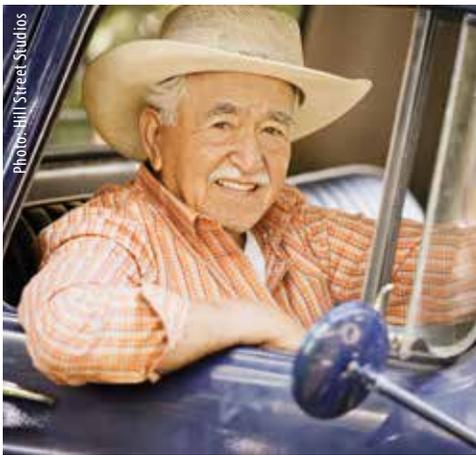
**• VA’s Army Chemical Corps Vietnam-Era Veterans Health Study** is trying to learn whether high blood pressure and COPD, including emphysema and chronic bronchitis, is related to Agent Orange exposure during the Vietnam War. The study is looking at the health status of some 4,000 Veterans who served in the U.S. Army Chemical Corps between 1965 and 1973. Army Chemical Corps personnel were responsible for the maintenance and distribution of chemicals for military operations. ([VA Office of Public Health website](#))

**For more information on VA studies on on respiratory health and other key topics relating to Veterans’ health, please visit [www.research.va.gov/topics](http://www.research.va.gov/topics)**

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*In the 1950s, a VA researcher found that the lungs of most smokers showed signs of lung cancer after their deaths, whether or not the illness was the reason they died.*

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## RURAL HEALTH

*Many Veterans who rely on VA for their health care live in remote areas—in some cases, hundreds of miles from the nearest VA facility. Providing comprehensive, high-quality health care to these Veterans is a challenge.*

### ABOUT RURAL HEALTH

- Our nation’s rural and highly rural Veteran population is large and widely dispersed, and is racially, ethnically, and culturally diverse.
- About [40 percent](#) of Veterans enrolled in the VA health care system live in rural areas. On average, these Veterans travel between 60 to 120 minutes for inpatient care, and 30 to 90 minutes for primary care.
- One-third of Iraq and Afghanistan Veterans live in rural or highly rural areas, and three-fourths of rural Veterans are over the age of 55.
- VA’s [Office of Rural Health](#), created in 2007, works to improve access to care and quality of care for enrolled rural and highly rural Veterans by developing evidence-based policies and new practices to help enrolled Veterans who live in geographically remote areas.

### VA RESEARCH ON RURAL HEALTH: OVERVIEW

- VA researchers develop and evaluate new technologies, interventions, and models of care to ensure access to high-quality health care for Veterans living in rural areas.

- VA researchers also work to understand patterns of care among rural Veterans and explore ways to partner with non-VA providers in areas where VA has no facilities.
- A Collaborative Research to Enhance and Advance Transformation and Excellence (CREATE) [group](#) of VA researchers is working with the Office of Rural Health to ensure that rural Veterans receive adequate levels of mental health care.
- VA’s [Charleston Health Equity and Rural Outreach Innovation Center](#) (HEROIC) aims to improve health outcomes among rural Veterans by examining the increasing role of technology on access to care.

### SELECTED MILESTONES AND MAJOR EVENTS

- 1995** - VA’s first community-based outpatient clinics are established, in part to better serve Veterans living in rural areas
- 2003** – VA’s national home telehealth program is implemented
- 2007** – The Office of Rural Health is established
- 2013** – The Charleston Health Equity and Rural Outreach Innovation Center (HEROIC) is established

### RECENT STUDIES: SELECTED HIGHLIGHTS

- **Women Veterans living in both rural and highly rural areas are older** and more likely to be married than their urban counterparts. Generally, the two groups have similar levels of several mental health disorders, hypertension, and diabetes. However, anxiety not related to PTSD is significantly lower for highly rural women Veterans. ([Journal of Rural Health](#), Spring 2014)
- **A bit of extra help can go a long way in getting rural Veterans to take advantage of VA care and benefits.** Researchers at the Tuscaloosa, Ala., VA Medical Center visited local communities to let rural Alabama Veterans know about the health care services VA offers. Veterans who received motivational interviews with a social worker, watched an educational video, and received a half-hour of enrollment support were more likely to attend an appointment at the Tuskegee VA than those who did not. ([Journal of Rural Health](#), Spring 2014)
- **HIV and hepatitis C telemedicine clinics were associated with better access to care and high patient satisfaction** in a study by researchers from

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the VA Greater Los Angeles Healthcare System. Another study, by a team at the VA Puget Sound Healthcare System, found that 3 in 4 Veterans living in the Pacific Northwest described themselves as either “satisfied” or “highly satisfied” with teledermatology for their skin problems. ([American Journal of Managed Care](#), April 2012; [Telemedicine Journal and e-health](#), June 2012)

• **Mailing stool tests to Veterans’ homes is an effective measure for preventing colorectal cancer**, according to researchers at the Iowa City VA Health Care System. The findings suggest that mailing Veterans screening kits, as opposed to waiting to screen patients during routine primary care visits, may be a more effective method to prevent colon cancer, especially for rural Veterans. ([Journal of Rural Health](#), Summer 2014)

• **Rural Arkansas Veterans needing mental health care have benefited from a partnership among clergy**, representatives of nonprofit organizations, Veterans, and mental health providers. The approach was tested in a study by VA’s Office of Rural Health, and found to help Veterans

who may be uncomfortable contacting mental health care providers and prefer instead to share problems with VA clergy or their church’s pastor. ([Progress in Community Health Partnerships](#), Spring 2014)

• **Veterans who live within one mile of a large hog farm** were more than three times as likely as others to test positive for a type of bacteria known as MRSA, or methicillin-resistant Staphylococcus aureus, according to researchers with the Iowa City VA Health Care System. MRSA infections can quickly become deadly because of the bacteria’s resistance to common antibiotics. ([Infection Control and Hospital Epidemiology](#), February 2014)

• **VA’s Telemedicine Outreach for PTSD (TOP) study involved 265 Veterans with PTSD, most living in rural areas.** Specialty teams based at VA medical centers partnered with providers at community-based outpatient clinics to deliver care to Veterans, including psychotherapy and medication management, via telephone and secure video hookups. The study found that “telemedicine-based collaborative care can successfully engage rural Veterans

in evidence-based psychotherapy to improve PTSD outcomes.” ([JAMA Psychiatry](#), November 19, 2014)

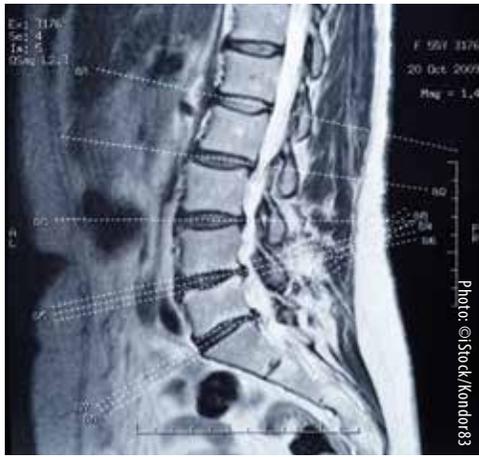
• **Better communication between VA and non-VA providers would improve patient safety** and satisfaction for rural Veterans who use both VA and non-VA care, according to a survey of 67 non-VA providers. The study was done by a team with VA and the University of Iowa. ([Military Medicine](#), November 2014)

**For more information on VA studies on rural health and other key topics relating to Veterans’ health, please visit [www.research.va.gov/topics](http://www.research.va.gov/topics)**

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*On average, VA-enrolled rural Veterans travel between 60 to 120 minutes for inpatient care, and 30 to 90 minutes for primary care.*

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## SPINAL CORD INJURY

*Spinal cord injuries (SCIs) hurt 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.*

### ABOUT SPINAL CORD INJURY

- The spinal cord is the main pathway for passing information between the brain and nerves that lead to muscles, skin, internal organs, and glands. Injury to the spinal cord disturbs movement, sensation, and function.
- Treating patients with SCIs requires both managing their injuries and working to prevent related problems from occurring.
- SCIs 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 males.
- VA treats more than 26,000 people with SCIs and related disorders each year, making the department the largest health care system in the world providing spinal cord care.

### VA RESEARCH ON SPINAL CORD INJURY: OVERVIEW

- VA researchers are studying what happens when SCIs take place, and are working to develop better ways for people to adapt to their injuries.
- VA's [SCI Quality Enhancement Research Initiative](#) (SCI-QUERI) works closely with the department's [Office of Spinal Cord Injury and Related Disorders](#) (SCI-D) to

improve the lives of Veterans with spinal cord injuries and disorders.

- VA's Rehabilitation Research and Development's (RR&D) [Center of Excellence for Restoration of Nervous System Function](#) is looking at ways to protect and restore nervous system function in people with disorders such as SCI and multiple sclerosis.
- RR&D's [Center of Excellence on the Medical Consequences of Spinal Cord Injury](#)'s is finding new ways to prevent and treat other problems that result from having a spinal cord injury, such as breathing problems, pressure ulcers, digestive issues, and circulatory problems.
- The [VA Center of Excellence in Functional Electrical Stimulation](#) focuses on applying electrical currents to either generate or suppress activity in the nervous system. This technique is known as functional electrical stimulation (FES).
- The [VA Center of Excellence for Neurorestoration and Neurotechnology](#) works on new ways to restore function in nervous system disorders that weaken movement and thinking.
- VA's [Spinal Cord Injury Collaborative Translational Consortium](#) fosters teams of leading SCI investigators to support high-risk, high-return ideas that would likely not

get funded through other programs, and to help scientists who are in pursuit of the same research goals to work together.

- The [VA Center of Excellence in Wheelchairs and Associated Rehabilitation Engineering](#) works to improve the movement and function of people with disabilities through advanced engineering techniques.

### SELECTED MILESTONES AND MAJOR EVENTS

- 2010** – VA forms the [Spinal Cord Injury Collaborative Translational Consortium](#)
- 2010** – An animal study is [published](#) showing that intravenously introduced bone marrow stem cells can protect an injured brain and spinal cord
- 2011** – Study results demonstrate that the [BrainGate](#) system effectively records brain signals for more than 1,000 days
- 2012** – In a demonstration using the DEKA robotic arm, people with paralysis of all four limbs reach for and grasp objects in space
- 2014** – The [ReWalk](#) exoskeleton, which helps paralyzed Veterans stand up and walk, receives approval for sale and distribution from the Food and Drug Administration

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**RECENT STUDIES: SELECTED HIGHLIGHTS**

• **VA has played a major role in supporting a system called BrainGate**, developed by researchers at Brown University and the Providence, R.I., VA Medical Center. The system uses an array of 1,000 tiny microelectrodes implanted in the brain to pick up brain signals. When BrainGate is implanted, people with paralysis of their lower body, upper body, and arms can control a robotic arm to reach and grasp for items, or control a computer cursor. ([Nature](#), May 16, 2012)

• **ReWalk is an exoskeleton, worn outside a person’s clothes**, that provides powered hip and knee motion that enables people with SCIs to stand upright and walk. Invented by an Israeli engineer, the system is being extensively tested and studied at the James J. Peters VA Medical Center in the Bronx, N.Y. ([VA Research Currents](#), August 15, 2014)

• **Axons are long, slender projections of nerve cells that transmit electrical signals**. Researchers with the VA San Diego Health Care System and the University of California have been able to restore them in rats. The investigators

used stem cells in a solution of fibrin (a protein used in blood clotting), mixed with growth factors to form a gel they then applied to the site of the injury in the rats. Following the therapy, the animals were able to move all of the joints of their affected legs. ([Cell](#), September 14, 2012)

• **Vocational rehabilitation specialists working together with clinical care providers** can help Veterans with spinal cord injuries prepare for, find, and keep suitable jobs, according to VA researchers from the North Texas Health Care System in Dallas. The program, called Individualized Placement and Support, has been used for more than 10 years to help Veterans with serious mental illnesses find employment. ([Archives of Physical Medicine and Rehabilitation](#), May 2012)

• **Regular 30-minute targeted phone calls from a trainer** can result in significant weight loss for disabled persons, including patients with SCIs, according to researchers from the Jesse Brown VA Medical Center in Chicago and the University of Alabama at Birmingham. The researchers found that disabled Veterans receiving a physical activity toolkit and regular calls from trainers had lost, on average, nearly five

pounds after nine months. Those who received no support gained an average of five to six pounds. ([American Journal of Physical Medicine and Rehabilitation](#), December 2013)

• **A new type of powered wheelchair has been developed by VA researchers** and colleagues at the University of Pittsburgh. The chair is fitted with robotic arms to help wheelchair users with limited hand function push themselves. The arms can also be used by remote control. ([University of Pittsburgh web site](#))

**For more information on VA studies on spinal cord injury and other key topics relating to Veterans’ health, please visit [www.research.va.gov/topics](http://www.research.va.gov/topics)**

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## SUBSTANCE USE DISORDERS

*Substance use and abuse is a major public health problem. It commonly occurs along with other mental and physical problems, such as depression or chronic pain.*

### ABOUT SUBSTANCE USE DISORDERS

- Substance use disorders (SUDs) include dependencies on alcohol, illegal and prescription drugs, and nicotine. SUDs hurt Veterans' mental and physical health, work performance, housing status, and their ability to function socially.
- Many Veterans have problems with the use of alcohol, tobacco, or drugs. This can include the use of street drugs as well as inappropriate use of prescription medications.
- In 2013, some [516,000](#) Veterans who use VA care had an SUD diagnosis.
- About [20 percent](#) of Veterans who use VA care are current smokers. This compares with about [18 percent](#) of U.S. adults in general.

### VA RESEARCH ON SUBSTANCE USE DISORDERS: OVERVIEW

- VA researchers look at preventing substance abuse, screening Veterans for substance abuse issues, and improving treatment for substance abusers. Some VA studies try to understand the genetic factors that may make people more likely to develop addictions to alcohol or drugs.

- VA operates two Centers of Excellence in Substance Abuse Treatment and Education (CESATE), at its medical centers in Puget Sound, Wash., and Philadelphia. The centers help find ways to improve VA's substance abuse treatment programs. They also look at research done throughout the world to find studies that can help Veterans with their substance abuse issues.

- VA's [Substance Use Disorder Quality Enhancement Research Initiative](#), based in Palo Alto, Calif., works to improve VA's ability to find and treat Veterans with addiction problems.

- A Collaborative Research to Enhance and Advance Transformation and Excellence (CREATE) [group](#) is working to promote the value of VA's substance use disorder services, and to improve Veterans' access to those services.

### SELECTED MILESTONES AND MAJOR EVENTS

**1941** – VA conducts its first study on the characteristics of alcoholics

**1956** – Researchers publish a study linking cigarette smoking with precancerous lesions

**1984** – Researchers develop the nicotine patch and other therapies to help smokers give up the habit

**2010** – VA develops a clinical practice guideline to manage the use of medications that relieve pain (opioids)

**2014** – VA and the National Institutes of Health announce a five-year initiative to explore non-drug approaches to managing pain and other health conditions

### RECENT STUDIES: SELECTED HIGHLIGHTS

• **Research suggests that Veterans are at a higher risk of alcohol misuse and alcohol-related problems** than other Americans. Investigators at the Memphis VA Medical Center found that two brief interventions providing Veterans who were hazardous drinkers with feedback on the consequences of drinking and with education on why people drink, were effective in reducing the misuse of alcohol, especially for Veterans with PTSD. ([Journal of Consulting and Clinical Psychology](#), August 2014)

• **A 26-week program conducted by a patient's usual care provider is just as effective as treatment by a specialized**

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**care provider** for treating alcohol dependence, according to researchers at the Philadelphia VA Medical Center. The researchers found that Veterans in the primary care treatment group were more than five times as likely to complete all 26 weeks of the program. Overall quitting drinking rates were the same between groups, and the primary care group had a smaller percentage of days when they drank heavily. ([Journal of General Internal Medicine](#), January 2014)

• **Human immunodeficiency virus (HIV)-infected patients who drink too much** also have problems with their memory, both in terms of their ability to recall facts and their activity memory (what they did yesterday.) Investigators at the Palo Alto VA Health Care System determined that providing care for HIV and alcohol use disorders together is important, and that routine alcohol and cognitive screenings may improve the health of HIV-infected patients. ([AIDS and Behavior](#), July 2014)

• **A vaccine for methamphetamine (meth) addiction showed promise in a lab study** at the Michael E. DeBakey VA Medical Center in Houston and Baylor

College of Medicine. The researchers gave mice three doses of the vaccine. Four weeks after the second dose, the mice were tested with different methamphetamine amounts. Mice that were not vaccinated showed changes in their movement patterns that could be attributed to meth addiction. Vaccinated mice showed much less of an effect. ([Drug and Alcohol Dependence](#), April 1, 2013)

• **For more than 30 years, cannabis (better known as marijuana) has been the most widely used illicit substance** in the United States. Palo Alto VA researchers found that the prevalence of cannabis use disorder in VA patients increased nearly 60 percent between 2002 and 2009. Although rates of cannabis use disorder among VA patients have increased greatly, they are still significantly lower than the rates in the general U.S. population. ([Psychological Services](#), November 2012)

• **Smokers have a nearly twofold increased risk of depression,** compared with both former smokers and those who had never smoked, according to a comprehensive review study by researchers with

the Edith North Rogers Memorial VA Medical Center in Bedford, Mass., and colleagues from the National Cancer Institute and the University of Iowa. Notwithstanding the strong association between the two conditions, researchers still can't say for sure whether there is a causal link between smoking and depression. ([Addictive Behaviors](#), October 2014)

• **Opioids are prescribed at increasing rates in the United States. VA's Care Management for the Effective Use of Opioids (CAMEO) trial** is comparing pain relievers with behavioral approaches such as cognitive behavioral therapy for the relief of chronic lower back pain. The study will compare the two interventions' effects on pain intensity, function, and other pain-relevant outcomes, and will also compare their cost-effectiveness. ([VA Health Services Research & Development website](#))

**For more information on VA studies on substance use disorders and other key topics relating to Veterans' health, please visit [www.research.va.gov/topics](http://www.research.va.gov/topics)**

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*In 2013, some 516,000 Veterans who use VA care had an SUD diagnosis.*

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## SUICIDE PREVENTION

*According to the Centers for Disease Control and Prevention, an estimated 30,000 to 32,000 lives are lost to suicide each year in the United States. About 20 percent of those who complete the act of suicide are Veterans.*

### ABOUT SUICIDE PREVENTION

- Veterans can be at risk for suicide for a variety of reasons. Some are coping with aging, stress, or lingering problems stemming from their military service that have never been addressed. Many have underlying mental health conditions. Many recently discharged Veterans have difficulty with their relationships or their transition back to civilian life.
- VA has established a toll-free, confidential Veterans Crisis Line at **1-800-273-8255 (1-800-273-TALK)**. The hotline, which is staffed by mental health professionals 24/7, has rescued more than 20,000 actively suicidal Veterans. VA also offers a texting service at #838255.
- Veterans and their families can chat online with trained counselors at [www.VeteransCrisisLine.net](http://www.VeteransCrisisLine.net). Registration with VA or enrollment in VA health care is not necessary. VA also has full-time suicide prevention coordinators at each of its 150 hospitals.
- [Evidence](#) suggests that since 2006, Veterans aged 18 through 29 who use VA health care are less likely to commit suicide than those who do not.

### VA RESEARCH ON SUICIDE PREVENTION: OVERVIEW

- VA investigators are exploring risk factors for suicide in Veterans and helping to improve their ability to assess whether a Veteran is at risk of attempting suicide. They are also working to develop effective ways to intervene to keep Veterans from harming themselves.
- VA's [Center of Excellence for Suicide Prevention](#), located at the Canandaigua, N.Y., VA Medical Center, tries to reduce Veteran suicides, primarily by studying and applying public health approaches to suicide prevention.
- Researchers at the [VISN 19 Mental Illness Research, Education, and Clinical Center](#) (MIRECC) in Denver work to provide useful information about suicide prevention to Veterans and to the community at large. They also look at ways to translate research findings into everyday care.
- VA is also part of the [Military Suicide Research Consortium](#), a partnership that works to increase knowledge on topics such as risk assessment, treatment, and prevention relating to suicidal behavior in the military and among Veterans.

### SELECTED MILESTONES AND MAJOR EVENTS

- 2007** – VA establishes the Center of Excellence for Suicide Prevention
- 2007** – Full-time suicide prevention coordinators are hired at all VA hospitals
- 2008** – The Veterans Crisis Line starts, adding an online chat service in 2009, and a texting service in 2011
- 2010** – VA begins working with the U.S. Army to study ways to prevent suicide among active-duty service members, Veterans, and reservists
- 2014** – VA launches major [study](#) of the drug lithium for suicide prevention

### RECENT STUDIES: SELECTED HIGHLIGHTS

- **To enable Veterans, their family members, and friends to get help to prevent suicides**, an [ACE \(Ask, Care, Escort\)](#) is available on the VISN 19 MIRECC's website. The MIRECC also offers a suicide attempt survivor family resource guide, and guides to talking to children about suicide attempts in their family. ([VISN 19 MIRECC website](#))

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• **The experience of killing in war is strongly associated with thoughts of suicide**, according to researchers with VA and the University of California, San Francisco. Veterans who have killed in war were twice as likely to have reported suicidal thoughts as those who had not. The study also found that the link between killing and actually attempting suicide was not as significant as the link between killing and suicidal thoughts. ([Depression and Anxiety](#), November 2012)

• **Changes in the levels of certain amino acids in the body may contribute to suicide risk**, say researchers at the Durham VA Medical Center and the Mid-Atlantic MIRECC. The amino acids in question are important in regulating people’s mood and behavior, although understanding their exact relationships to suicide will require further study. ([Military Medicine](#), May 2014)

• **A series of ribonucleic acid (RNA) biomarkers in blood may help identify people at risk for committing suicide.** (RNA is an acid that transmits genetic information

and is present in all cells.) In a study at the Richard L. Roudebush VA Medical Center in Indianapolis, the biomarkers were found at significantly higher levels in the blood of bipolar disorder patients with thoughts of suicide, and in Veterans and other people who had committed suicide. ([Molecular Psychiatry](#), December 2013)

• **Traumatic brain injury is a risk factor for suicide**, according to a study by researchers at the VISN 19 MIRECC. Compared with Veterans with no history of TBI, those with such a history were 1.5 times more likely to die by suicide. Within the TBI group, those who had suffered a concussion or a skull fracture were most likely to take their own lives. ([Journal of Head Trauma Rehabilitation](#), July-August 2011)

• **Pain, TBI, and posttraumatic stress disorder (PTSD) can all raise the risk of suicide.** Veterans who have all three problems combined have double the risk of suicide compared to other Veterans. PTSD has by far the largest effect, according to researchers at the South Texas VA Health Care System in Dallas. Adding depression or substance

abuse to PTSD significantly raises the risk of suicide over PTSD alone. ([American Journal of Public Health](#), July 17, 2014)

• **Lithium, a drug that has been available since the 19th century, may be useful for preventing suicide.** VA’s Cooperative Studies program is conducting a study on 1,800 Veterans with bipolar disorder or depression who recently survived a suicide attempt, or were hospitalized to prevent one. Half will receive the drug, and half will not. All will get VA’s standard mental health care, plus extra care coordination. The study will look at outcomes such as repeat suicide attempts and hospitalizations to prevent suicide. ([VA Research Currents](#), September 17, 2014)

**For more information on VA studies on suicide prevention and other key topics relating to Veterans’ health, please visit [www.research.va.gov/topics](http://www.research.va.gov/topics)**

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*Evidence suggests that since 2006, Veterans aged 18 through 29 who use VA health care are less likely to commit suicide than those who do not.*

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# TRAUMATIC BRAIN INJURY

*Traumatic brain injury (TBI) is common among war Veterans. Often the result of exposure to blasts, it has been called a "signature injury" of modern combat.*

## ABOUT TRAUMATIC BRAIN INJURY

- TBI can result from a blow or jolt to the head, such as from an explosion, or from an object penetrating the head.
- TBI can cause changes in consciousness that range from becoming confused to slipping into a coma. The person may also lose memory of the time immediately before or after the event.
- TBI symptoms can include headaches, irritability, poor sleep, memory problems, slower thinking, and depression. These symptoms can persist long-term
- In one recent [survey](#) of Iraq and Afghanistan Veterans, nearly 11 percent of women and 20 percent of men screened positive for TBI related to their deployment.
- Most military-related TBIs are considered mild, but even these can involve long-term health effects that significantly impact quality of life.

## VA RESEARCH ON TRAUMATIC BRAIN INJURY: OVERVIEW

- Among the goals of VA researchers working in this field are to shed light on brain changes resulting from TBIs, to improve the ways VA screens Veterans for the injury and diagnoses the condition,

and to develop drugs to treat brain injury or limit its seriousness when it first occurs.

- VA researchers are designing better ways to monitor how well treatments work, and developing new ways to support and educate family members of Veterans with TBI.
- VA's [Translational Research Center for TBI and Stress Disorders](#) in Boston studies the impact on Veterans of TBI and PTSD.
- VA's [Brain Rehabilitation Resource Center](#) in Gainesville, Fla., develops and tests treatments to improve or restore motor, thinking, and emotional impairments caused by brain disease or injury.
- VA's [Traumatic Brain Injury Center of Excellence](#) in Houston focuses on mild TBI.
- VA's [War Related Illness and Injury Study Center](#) develops and provides post-deployment health expertise to Veterans and their health care providers through clinical programs, research, education, and risk communication.
- VA's [Polytrauma System of Care](#) is a network of specialized rehabilitation programs dedicated to serving Veterans and service members with TBI and multiple complex, severe injuries, called polytrauma.

- The [Defense and Veterans Brain Injury Center \(DVBIC\)](#) serves active-duty military, their beneficiaries, and Veterans with TBI through state-of-the-art clinical care, innovative research and educational programs, and support for force health protection services.

## SELECTED MILESTONES AND MAJOR EVENTS

- 2008** – VA sponsors an international conference on TBI and expands VA research in this area
- 2012** – VA researchers associate TBI with [chronic traumatic encephalopathy](#), a degenerative disease
- 2012** – VA begins a study to determine whether TBI and PTSD increase Alzheimer's risk as Veterans age
- 2013** – As part of the government's [National Research Action Plan](#), VA and DoD fund the establishment of [new research consortia](#) on TBI and PTSD

## RECENT STUDIES: SELECTED HIGHLIGHTS

- **Veterans exposed to blasts from bombs, grenades, and other devices** may still have brain damage even if they have no symptoms of TBI, according to a study by researchers at VA's Mid-Atlantic Mental Illness Research Education and

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Clinical Center (MIRECC) in Durham, N.C., and Duke University. The results of the study suggest that a lack of symptoms of TBI after a blast may not indicate the extent of brain damage caused by the blast. ([Journal of Head Trauma Rehabilitation](#), March 4, 2014)

• **TBI patients have a slightly increased rate of stroke compared to other patients.** Investigators at the Ann Arbor VA Medical Center hypothesize that because TBI can cause bleeding in the brain, it may increase the risk for stroke. ([Neurology](#), July 2, 2013)

• **Older Veterans with a TBI diagnosis have a 60-percent greater risk of developing dementia** over a nine-year period than other older Veterans. The results of this study by investigators with VA and the University of California, San Francisco, raise concern about the potential long-term consequences of TBI. ([Neurology](#), July 22, 2014)

• **Whether TBI and PTSD increase Alzheimer’s risk as Veterans age is the subject of an ongoing study.** The study, called DOD-ADNI, is funded by the Department of Defense (DoD). Its lead investigator is Dr. Michael Weiner, a VA investigator in San Francisco

who heads the [Alzheimer’s Disease Neuroimaging Initiative](#) (ADNI). ([Clinicaltrials.gov](#))

• **In contrast to more severe TBI, mild TBI is difficult to identify and treat.** Despite being called mild, up to 20 percent of those with this injury will suffer from post-concussion syndrome, a complicated mix of troublesome symptoms and problems. The Defense and Veterans Brain Injury Center has developed a structured interview doctors can use to better identify mild TBI in patients. ([Journal of Neurotrauma](#), September 29, 2014, epub ahead of print)

• **An artificial communication link inserted in the brain can restore functions lost as a result of TBI,** according to a team of researchers from the Louis Stokes VA Medical Center in Cleveland, the University of Kansas, and Case Western University. The team fitted a tiny device containing a chip into the brains of rats whose motor skills had been impaired as a result of TBI. The device allowed the rats to recover nearly all the function they had lost. ([Proceedings of the National Academy of Sciences of the United States of America](#), December 24, 2013)

• **Treating Veterans and family members in a group to learn about mild TBI,** to solve problems, and to establish life goals was found to be highly acceptable to group members in a study by investigators from the Durham (N.C.) VA Medical Center. The therapy shows both Veterans and their family members that they are not alone, and helps integrate the family into patient care. ([Psychiatric Services](#), June 2013)

**For more information on VA studies on traumatic brain injury and other key topics relating to Veterans’ health, please visit [www.research.va.gov/topics](http://www.research.va.gov/topics)**

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*TBI symptoms can include headaches, irritability, poor sleep, memory problems, slower thinking, and depression. These symptoms can persist long-term.*

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## VIETNAM VETERANS

*Vietnam Veterans represent the largest group of living American Veterans, in terms of service era. VA research has long worked to provide Vietnam Veterans with high-quality health care to meet their specific needs.*

### ABOUT VIETNAM VETERANS

- Approximately 2.7 million American men and women served in Vietnam, and more than 58,000 service men and women lost their lives during the war.
- Advances in medical evacuation and treatment during the Vietnam War meant that many troops survived the war with serious injuries that likely would have been fatal in previous wars.
- While the majority of Vietnam Veterans successfully readjusted to postwar life, many have suffered from psychological problems and experienced a wide range of adjustment problems.
- VA's [Vet Centers](#) provide a broad range of counseling, outreach, and referral services to Vietnam Veterans, as well as to Veterans of other periods.

### VA RESEARCH ON VIETNAM VETERANS: OVERVIEW

- During the Vietnam War, the U.S. military used more than 19 million gallons of various herbicides for defoliation and crop destruction. VA established an [Agent Orange Registry](#) to study the health effects associated with exposure to these herbicides.

- VA's [War Related Illness and Injury Study](#) Center provides post-deployment health expertise to Vietnam Veterans and their health care providers through clinical programs, research, and education.
- In 1983, the [National Vietnam Veterans Readjustment Study](#) (NVVRS) revealed that a substantial minority of Vietnam-era Veterans were suffering from a variety of psychological problems and experiencing a wide range of problems, such as trouble in their marriages and work difficulties—and that only a small number of these Veterans sought mental health care.
- The [Vietnam Era Twin \(VET\) Registry](#) consists of some 7,000 male twin pairs, all of whom served in the military during Vietnam. Although it was initially formed to address questions about the long-term health effects of service in Vietnam, it has turned into a resource for genetic studies on a number of other health issues affecting Veterans.

### SELECTED MILESTONES AND MAJOR EVENTS

- 1962** – Operation Ranch Hand begins
- 1975** – Vietnam War ends
- 1979** – First VA Vet Centers are established
- 1986** – Vietnam Era Twin (VET) Registry is initiated

**1988** – National Vietnam Veterans Readjustment Study (NVVRS) is initiated

**2009** – The largest health study ever of Vietnam-era women Veterans begins, with up to 10,000 women expected to take part

**2014** – First [results](#) released from National Vietnam Veterans Longitudinal Study

### RECENT STUDIES: SELECTED HIGHLIGHTS

- **The experience of killing in war is strongly associated with thoughts of suicide**, according to researchers with VA and the University of California, San Francisco, who studied NVVRS data. Veterans who killed in war were twice as likely to have reported suicidal thoughts as those who had not. The study also found that the link between killing and actually attempting suicide was not as significant as the link between killing and suicidal thoughts. ([Depression and Anxiety](#), November 2012)
- **The rate of non-melanoma skin cancer among Vietnam Veterans** on the Agent Orange Registry is about twice as high as among other men of the same age. The risk of skin cancer was highest among Veterans involved in spraying Agent Orange, according to investigators at the

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Washington, DC, VA Medical Center and the University of Texas. However, they found no increased risk of malignant melanoma, the most dangerous type of skin cancer. ([Plastic and Reconstructive Surgery](#), February 2014)

• **An area of the brain called the dorsal anterior cingulate is activated more greatly** in response to stimuli in Vietnam Veterans who were exposed to combat and developed PTSD—and in their non-exposed twins—compared with combat Veterans who did not develop PTSD, and their twins. The study by Puget Sound VA researchers contributes toward the quest for underlying biological factors that may make some people more vulnerable to PTSD. ([American Journal of Psychiatry](#), September 2011)

• **Vietnam Veterans with PTSD have poorer health and increased disability today** compared to those who did not develop PTSD, according to a study of nearly 5,600 Veterans by Seattle-based VA investigators. The same was true for Veterans who saw combat, compared to those who did not. ([Quality of Life Research](#), June 2014)

• **Prolonged exposure therapy is one of two evidence-based psychotherapies** for PTSD being promoted in VA. A study compared the results of this treatment among Veterans of the Vietnam War, the Persian Gulf War, and the wars in Afghanistan and Iraq. It found that Veterans from all three groups showed significant improvement in their PTSD symptoms, although Persian Gulf Veterans did not respond as well as the other two groups. ([Psychological Services](#), February 2012)

• **Most Vietnam Veterans and Veterans of the wars in Iraq and Afghanistan who had sustained major traumatic limb loss** reported to Seattle VA medical center researchers that their health status was excellent, very good, or good. However, many health issues persist for Veterans of both eras, including pain, skin problems, TBI, and PTSD. ([Journal of Rehabilitation Research and Development](#), Volume 47, Issue 4, 2010)

• **VA researchers have launched a comprehensive examination of the health of Vietnam-era women Veterans.** A five-year multisite study is examining the prevalence of PTSD and

other mental and physical conditions in up to 10,000 women Veterans from this era. ([VA Cooperative Study Program #579](#))

• **Congress has directed VA to manage a follow-up study to NVVRS** on the long-term effects of military service in Vietnam. The NYU Langone Medical Center and Abt Associates are conducting the study, called the National Vietnam Veterans Longitudinal Study. Some preliminary results include the finding that male Vietnam Veterans who had PTSD related to their combat service were more likely to die in the 25 years between the two studies than those who did not have combat-related PTSD. The study adds evidence that PTSD may also be associated with increased risk for many chronic health conditions, such as heart disease, nervous symptom disorders, and joint or muscle pain. ([Abt Associates Press Release](#), August 8, 2014)

**For more information on VA studies on Vietnam Veterans and other key topics relating to Veterans' health, please visit [www.research.va.gov/topics](http://www.research.va.gov/topics)**

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*While the majority of Vietnam Veterans successfully readjusted to postwar life, many have suffered from psychological problems and experienced a wide range of adjustment problems.*

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## VISION LOSS

*As many as 1.5 million Veterans have vision impairments that interfere with their ability to perform everyday tasks.*

### ABOUT VISION LOSS

- About 167,000 U.S. Veterans are legally blind, and about [285,000](#) have glaucoma, a condition in which fluid pressure in the eyeball increases, causing gradual loss of sight.
- In older Veterans, major causes of vision loss include age-related macular degeneration, glaucoma, cataracts, stroke, and complications of diabetes.
- Among Veterans who have served in Iraq and Afghanistan, blast-related brain injuries can be followed by vision problems such as blurred vision, double vision, sensitivity to light, and difficulty reading.
- Throughout the nation, VA has 13 [Blind Rehabilitation Centers](#), which are residential inpatient training programs that help Veterans adjust to their blindness.
- The [Visual Impairment Center to Optimize Remaining Sight](#) (VICTORS) program supports Veterans who are not blind but have significant visual impairments.

### VA RESEARCH ON VISION LOSS: OVERVIEW

- VA research projects in the area of vision loss and vision restoration cover the entire range of Veterans’ needs.

- In addition to developing vision-restoring treatment, VA investigators are designing and improving devices to assist those with visual problems, and developing more accurate and efficient methods of vision testing.
- The Atlanta VA Medical Center’s [Rehabilitation Research and Development Center of Excellence for Visual and Neurocognitive Rehabilitation](#) conducts research on rehabilitating visual and related brain and nervous-system problems.
- Researchers at the [VA Center for the Prevention and Treatment of Visual Loss](#), located in Iowa City, focus on the early detection of problems that may cause blindness, including retinal disease, glaucoma, and traumatic brain injury (TBI). They also develop new ways to treat those problems.

### SELECTED MILESTONES AND MAJOR EVENTS

- 1944** – President Franklin D. Roosevelt signs an executive order requiring training for blinded Veterans
- 1947** – VA researchers develop the first mobility and orientation rehabilitation training program for blind persons

**1948** – VA establishes its first Blind Rehabilitation Center for Veterans, in Hines, Ill.

**1975** – VA develops the C-5 Laser Cane to help blinded Veterans navigate

**2004** – VA trial shows improvements in macular degeneration with the supplement lutein

**2013** – VA researchers learn that more than 65 percent of Veterans with blast-induced TBI in a study group also have vision problems, and 77 percent have sensitivity to light

### RECENT STUDIES: SELECTED HIGHLIGHTS

- **Many Veterans who have had blast injuries also have “hidden eye injuries”** that may not be found without comprehensive eye examinations. VA Palo Alto researchers found that 43 percent of Veterans they studied suffered what ophthalmologists call “closed eye ocular injuries”—injuries that do not actually penetrate the eye. They recommend any patient with a TBI diagnosis have a comprehensive eye examination to check for hidden eye injuries that may cause future problems such as glaucoma. ([New England Journal of Medicine](#), June 2, 2011)

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• **More than 65 percent of Veterans with TBI from blast injuries had vision problems**, and 77 percent reported they were sensitive to light, in a study of 50 Veterans by VA researchers in Palo Alto. Other difficulties included problems with eye movement, blurred vision, and problems focusing. The same number of Veterans with non-blast-related TBI was also studied, and the rates of vision complaints were similar. ([Optometry and Vision Science](#), February 2013)

• **A clinical tool that can be used by any eye care provider** as a screening tool or as part of a full eye exam for patients with mild TBI has been developed by VA researchers. The tool includes guidance for collecting a history of the patient's experiences and for measuring his or her vision function. ([Journal of Rehabilitation Research and Development](#), Vol. 50, No. 6)

• **Physical activity can protect eyes as they age**, according to Atlanta VA Medical Center and Emory researchers. The team ran mice on a treadmill for an hour a day two weeks before and after exposing the animals to bright white light, similar to daylight. The exercised

animals lost only half the number of photoreceptor cells in their retinas, compared with animals that were not exercised. ([Journal of Neuroscience](#), February 12, 2014)

• **Telephone-based medication and behavior management** can help reduce high blood pressure in people with diabetes. Investigators at the Durham VA Medical Center found that patients whose blood pressure improved thanks to the intervention also had about half the risk of worsening diabetic retinopathy, compared with those receiving usual care. Diabetic retinopathy is a complication of diabetes that damages the retina and can eventually lead to blindness. ([JAMA Ophthalmology](#), July 2013)

• **Telemedicine is a cost-effective way to screen Veterans under 80 years of age for signs of diabetic retinopathy**, according to VA researchers. Their study found it is not cost-effective to use telemedicine for diabetic retinopathy screening in patients aged 80 or older, or in settings where fewer than 3,500 patients require screening. ([Ophthalmology](#), December 2013)

• **To help blind people and those with low vision to find their way**, researchers at the Atlanta VA Medical Center are developing a smartphone app to track user movement. The accurate location information the app provides can help users easily find destinations such as crosswalks and building entrances. Other wayfinding projects at the site include the use of radio-frequency identification tags to send information automatically to smartphones, and special fast-darkening sunglasses to help people with macular degeneration. ([VA Research Currents](#), October 21, 2014)

**For more information on VA studies on vision loss and other key topics relating to Veterans' health, please visit [www.research.va.gov/topics](http://www.research.va.gov/topics)**

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*Approximately 167,000  
Veterans are legally blind, and  
about 285,000 have glaucoma.*



Photo: Cade Martin

## WOMEN'S HEALTH

*There are more than 1.9 million women Veterans in the U.S., and the percentage of the total number of America's Veterans they represent is increasing. VA's research on women's health issues helps improve the department's ability to care for women Veterans of all eras.*

### ABOUT WOMEN'S HEALTH

- The presence of women in the U.S. armed forces has increased greatly in recent years, as has the number of women Veterans seeking VA health care.
- Living women Veterans currently make up more than 8 percent of the total Veteran population. By 2018, women are expected to account for 10 percent of all Veterans.
- In the early 1990s, women's health issues were declared a research priority, and VA took steps to increase the participation of women Veterans in its studies.
- In 2005, VA formed a Women's Health Research Planning Group and tasked the group with developing a research agenda for women Veterans and establishing VA as a national leader in investigating women's health issues. Their [report](#) was issued in 2006.

### VA RESEARCH ON WOMEN'S HEALTH: OVERVIEW

- VA researchers are looking at a wide range of health issues related to women Veterans, including chronic diseases, reproductive health, cancer, mental health issues, and military occupational hazards.

- VA research on women Veterans aims to develop new ways to treat health issues important to women; build the skills of those who treat women Veterans; and identify the best strategies to address family and reproductive issues.
- VA's [Women's Health Research Network](#) is designed to build VA's capacity to conduct studies on women Veterans' health.
- A 2011 [review](#) of research on women Veterans revealed that more information was published by VA researchers in the five years from 2004 through 2008 than in the 25 years before that.
- [VA's Women's Health CREATE](#), established in 2013, is among the VA groups now spearheading research on women Veterans' health.

### SELECTED MILESTONES AND MAJOR EVENTS

- 1988** – Dr. Patricia Resick develops cognitive processing therapy to relieve the symptoms of PTSD experienced by victims of sexual violence
- 2007** – VA researchers demonstrate the value of prolonged exposure therapy as a treatment for PTSD in female Veterans and active-duty military personnel

**2009** – VA Research begins the largest health study ever of Vietnam-era women Veterans, with up to 10,000 women expected to take part

**2014** – VA researchers publish studies on how combat-related PTSD symptoms differ by gender

### RECENT STUDIES: SELECTED HIGHLIGHTS

- **Prolonged-exposure therapy—a type of behavioral therapy in which therapists help patients recall their traumas under safe, controlled conditions**—is more effective in reducing PTSD symptoms than an intervention called present-centered therapy. Partly as a result of this study, conducted by VA's National Center for PTSD, the department launched a nationwide effort to train more clinicians in this therapy. (*Journal of the American Medical Association*, February 28, 2007)
- **Women reported more severe PTSD symptoms and higher rates of probable PTSD than did men** in a study of 801 National Guard soldiers deployed to Iraq or Afghanistan. The researchers, from the Minneapolis VA Health Care System, said combat-related stressors; concerns about

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life and family disruption; and prior victimization, such as sexual abuse, are all associated with the severity of post-deployment PTSD symptoms in women. ([Journal of Psychiatric Research](#), February 2014)

• **Women aged 50 to 75 face no extra risk of breast cancer** if they get a screening mammogram every two years instead of every year, according to a national study led by a researcher from the San Francisco VA Medical Center. Less frequent screening means less overall risk of false positives. Not every health provider abides by the recommendations of this research, however. Women ages 40 to 50 and those older than 75 should talk with their health care providers about the risks and benefits of having mammograms and make a decision based on their individual needs. ([JAMA Internal Medicine](#), May 13, 2013)

• **Many servicewomen believe that the disadvantages of reporting sexual assault outweigh the advantages.** A study by investigators from the Iowa City VA Medical Centers found that fear of a career-threatening

reprisal could be a factor in whether or not to report an assault. Other issues included concerns about confidentiality, and a belief that nothing would be done if the assault was reported. ([American Journal of Preventative Medicine](#), July 2014)

• **Taking soy tablets doesn't boost bone density or help ease menopause symptoms,** according to Miami VA researchers. In their study, older women who had recently reached menopause took either 200 milligrams of a soy tablet or a placebo each day. After two years, there were no differences in bone density in the spines, hips, or femurs of women in the study. ([Archives of Internal Medicine](#), August 8, 2011)

• **Maintaining the social support of military peers** after active duty is associated with better physical health among women Veterans, regardless of whether or not they have PTSD, according to VA Puget Sound Health Care System researchers. They analyzed the extent to which women Veterans maintained the social support of their military friends against the way they

reported on their own physical health, and the number of times they used VA health care. ([Journal of Traumatic Stress](#), December 2013)

• **VA has launched a comprehensive study of the health of Vietnam-era women Veterans.** A five-year multisite study is examining the prevalence of PTSD and other mental and physical conditions in women Veterans, and the relationship of PTSD to their experiences while deployed. ([VA Cooperative Study Program #579](#))

**For more information on VA studies on women's health and other key topics relating to Veterans' health, please visit [www.research.va.gov/topics](http://www.research.va.gov/topics)**

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*VA researchers are looking at a wide range of health issues related to women Veterans, including chronic diseases, reproductive health, cancer, mental health issues, and military occupational hazards.*

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