

# VA RESEARCH AND DEVELOPMENT PROGRAM OVERVIEW

DISCOVERY — INNOVATION — ADVANCEMENT



Veterans Health Administration  
**Research & Development**

Improving Veterans' Lives — [www.research.va.gov](http://www.research.va.gov)



## The VA Research and Development Program: Improving Veterans' Lives Through Health Care Research

VA RESEARCH — DISCOVERY, INNOVATION, ADVANCEMENT



For more than 60 years, the Veterans Affairs (VA) Research and Development program has been improving the lives of Veterans and all Americans through health care discovery and innovation. ■ The VA Research program is unique because of its focus on medical issues that affect Veterans. It is part of an integrated health care system with a state-of-the-art electronic health record and has come to be viewed as a model for superior bench-to-bedside research. ■ The groundbreaking achievements of VA investigators—70 percent of whom also provide direct patient care—have resulted in three Nobel prizes, six Lasker awards, and numerous other distinctions. ■ While realizing the advantages of an intramural program and embracing its close ties to academic affiliates, the VA Research and Development program fosters dynamic collaborations with other federal agencies, nonprofit organizations, and private industry—thus furthering the program's impact on the health of Veterans and the nation.

**“By spearheading research that directly advances the medical care of Veterans, the VA Research and Development program has become an acclaimed model for conducting superior bench-to-bedside research.”**



—Joel Kupersmith, M.D., Chief Research and Development Officer,  
Veterans Health Administration



VA's Research and Development program is an essential part of our mission to provide cutting-edge health care to our Nation's Veterans. As we seek to transform VA, three fundamental attributes mark the starting point for framing a 21st Century Organization: people-centric, results-driven and forward-looking; these attributes require continued and increased emphasis on discovery, innovation and best-practices.

— Eric K. Shinseki, VA Secretary, Department of Veterans Affairs

## Intramural Program, Collaborative Spirit

*The VA Research program consists of four main research services working together to address the full spectrum of Veterans' health needs.*

### BIOMEDICAL LABORATORY

#### *Research and Development*

This division conducts preclinical research to understand life processes from the molecular, genomic, and physiological level in regard to diseases affecting Veterans. It includes research on animal models and investigations of tissues, blood, or other biologic specimens from humans, but does not include studies with people.

### CLINICAL SCIENCE

#### *Research and Development*

This division focuses on clinical trials and other research involving human volunteers to study new treatments, compare existing therapies, and improve clinical practice and care.

The *Cooperative Studies Program* within this division is responsible for planning and conducting VA's large multicenter clinical trials and epidemiological studies on health issues vital to our nation's Veterans.

### HEALTH SERVICES

#### *Research and Development*

This division supports research to improve the delivery of health care to Veterans. Among the areas studied are quality and organization of care; patient access and outcomes; and cost-effectiveness.

The division's *Quality Enhancement Research Initiative* (QUERI) is designed to translate research findings into advancements in Veterans' care.

### REHABILITATION

#### *Research and Development*

This division conducts research to discover knowledge and create innovations that restore Veterans who have become disabled due to injury or disease to their greatest possible functional capacity in their families, communities, and work places.

### CROSS-CUTTING COMPONENTS

Other programs are cross-cutting. The *Program for Research Integrity Development and Education* (PRIDE), for example, is responsible for policy development, guidance, training, and education in relation to the protection of human research participants throughout VA. And the *Technology Transfer Program* is dedicated to translating discoveries and inventions by VA researchers into practice.

### PRODUCTIVE PARTNERSHIPS

While embracing its status as an intramural program with close ties to its academic affiliates, the VA Research program also fosters and develops dynamic collaborations with other federal agencies, nonprofit organizations, and private industry. Such teamwork promotes the leveraging of resources, speeds the translation of study results into clinical practice, and maximizes the overall impact of VA Research.

Through innovation and discovery that have led to advances in health care for Veterans and all Americans, the VA Research and Development program:

- Offers Veterans a promise for a brighter tomorrow
- Serves as a model of research excellence
- Attracts exceptional investigators
- Fosters dynamic collaborations

## Profound Progress, 1940s to 2000s

*Over the decades, VA researchers have been on the leading edge of numerous momentous health advances.*

### 2000s

- Showed the effectiveness of a new vaccine for shingles, a painful skin and nerve infection that affects older adults.
- Identified a protein derivative that disrupts memory in an animal model of Alzheimer's disease and offers promise for developing early-detection tests or new drugs.
- Announced major funding initiatives for research on neurotrauma, chronic pain, and other health problems prevalent in combat-wounded Veterans returning from Afghanistan and Iraq.
- Launched a multisite trial to test robotic therapy for stroke rehabilitation.
- Demonstrated that a behavioral therapy called prolonged exposure is effective for treatment of PTSD.
- Developed high-performance prosthetic devices, such as a bionic ankle that helps propel users forward.
- Showed that implantable cardiac defibrillators decrease the risk of death in those with advanced chronic heart failure.

### 1990s

- Found that the insulin pump is more effective than multiple daily injections for patients with diabetes.
- Identified genes for schizophrenia, dementia, laryngeal cancer, Werner's syndrome, and Alzheimer's disease.
- Developed an electrical stimulation system that helps patients move paralyzed limbs.
- Nobel Prize in Medicine awarded to former VA researcher Ferid Murad, M.D., Ph.D.

### 1980s

- Developed the nicotine patch and other therapies to support smoking cessation.
- Developed a computer-controlled ventilator system that improved patient outcomes.
- Developed the Seattle Foot, a prosthesis that allows amputees to run and jump.



VA has supported the development of a powered ankle-foot prosthesis that will help patients walk faster with fewer balance problems, and a neurally controlled arm and hand prosthesis that will perform, look, and feel like a natural limb, making handling objects much easier.

### 1970s

- Identified best treatments for colon cancer, stable angina, high blood pressure, and other conditions.
- Nobel Prizes in Medicine awarded to VA researchers Andrew Schally, Ph.D., and Rosalyn Yalow, Ph.D.

### 1960s

- Performed the first successful liver transplant and developed anti-rejection techniques.
- Pioneered concepts leading to the development of the CAT (CT) scan.

### 1950s

- Contributed to the development and early use of the implantable cardiac pacemaker.
- Linked smoking with cancer of the respiratory tract and lung.

### 1940s

- Developed and tested effective therapies for tuberculosis.
- Developed the first rehabilitation program for blind persons and standards for better-fitting, lighter artificial limbs.

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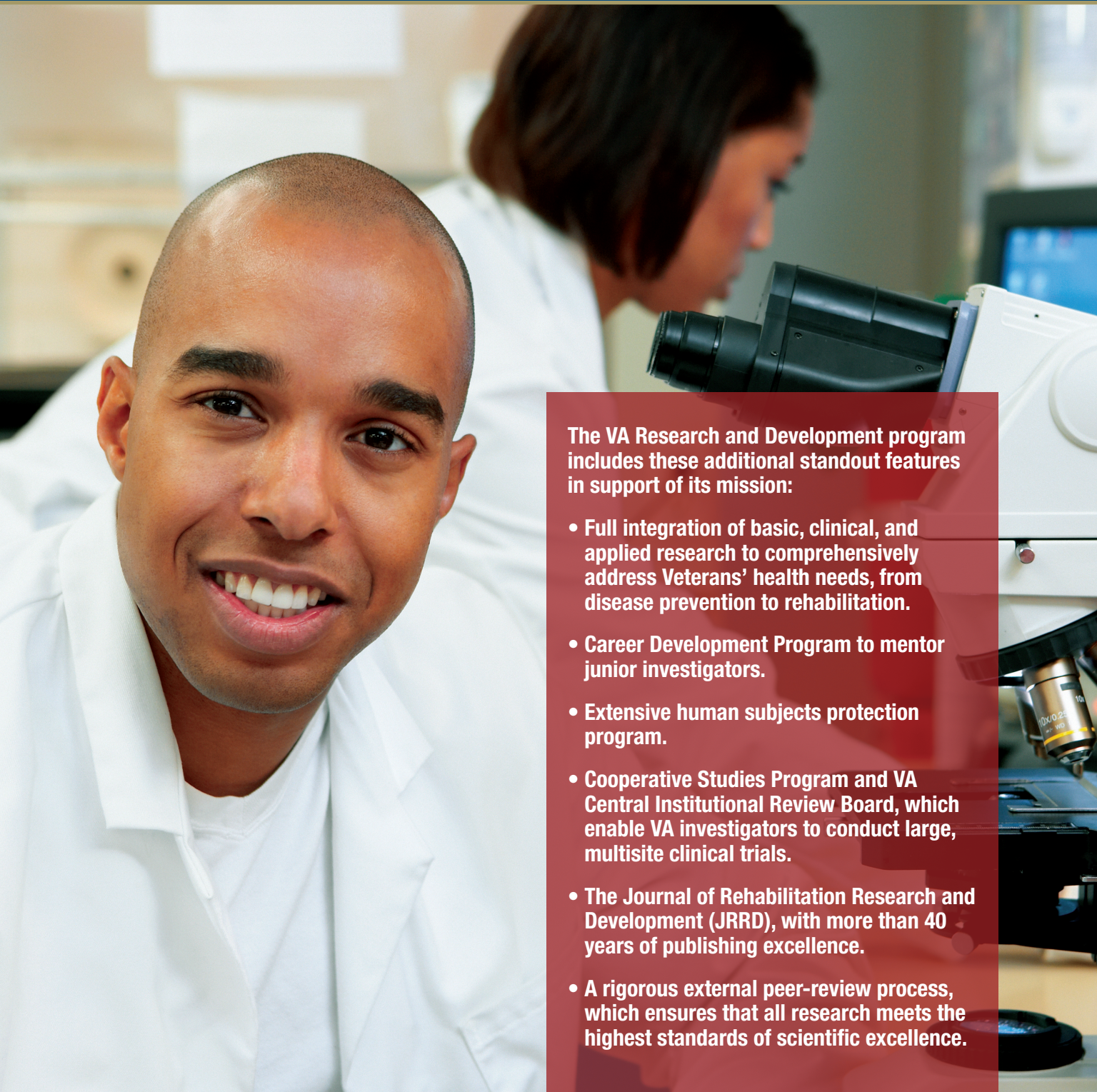
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# DISCOVERY →



The VA Research and Development program is positioned within an integrated health care system with a state-of-the-art electronic health record. This allows investigators to conduct pioneering research and also provide patient care—a distinctive dual opportunity that attracts the best and brightest to the program and enables VA to rapidly move scientific discoveries from bench to bedside. VA research accomplishments span the full spectrum of Veterans' health concerns.

# INNOVATION



The VA Research and Development program includes these additional standout features in support of its mission:

- Full integration of basic, clinical, and applied research to comprehensively address Veterans' health needs, from disease prevention to rehabilitation.
- Career Development Program to mentor junior investigators.
- Extensive human subjects protection program.
- Cooperative Studies Program and VA Central Institutional Review Board, which enable VA investigators to conduct large, multisite clinical trials.
- The Journal of Rehabilitation Research and Development (JRRD), with more than 40 years of publishing excellence.
- A rigorous external peer-review process, which ensures that all research meets the highest standards of scientific excellence.

# → ADVANCEMENT



VA Research represents the promise of a brighter tomorrow for Veterans. The research process in VA starts with a close focus on the everyday health needs and concerns of Veterans. Solutions are identified and developed through careful, rigorous research in labs and clinics. These solutions are then applied to patient care as rapidly as possible. "Sometimes it works miracles," one Veteran has said of the program, which touches the lives not only of Veterans but of their family members and caregivers, as well as many others in the nation who ultimately benefit from VA medical discoveries.

## Advancements

*Following are some examples of VA Research progress.*

### *Operation Enduring Freedom/Operation Iraqi Freedom (OEF/OIF)*

VA researchers are working on new ways to ease the physical and psychological pain of returning soldiers and to improve their access to health care services. Key areas of study include polytrauma, mental health issues, vision and hearing loss, traumatic brain injury, spinal cord injury, amputations and prosthetics, pain management, and burns.

### *Mental Health*

Mental health—including issues such as substance use, post-traumatic stress disorder (PTSD), anxiety, depression, and schizophrenia—is a major focus of VA Research. Researchers are studying new drug therapies, enhancing primary care models of mental health care, and improving access to mental health care through telehealth and other innovative technologies.

### *Prosthetics and Amputation Care*

VA researchers are using advanced technology such as robotics, tissue engineering, and nanotechnology to design and build lighter, more functional prosthetic devices that will perform, look, and feel like natural limbs. Researchers are also exploring new methods to improve the reconstruction of injured extremities and studying how to best match available prosthetic components to the needs of amputees, many of whom seek to maintain active lifestyles that demand versatile, high-performance prostheses.

### *Personalized Medicine*

VA's personalized medicine initiative is aimed at tailoring care to the individual veteran—for example, predicting a patient's risk for a certain condition or response to a specific drug. The program will eventually allow VA providers to customize treatment based on an individual's genetic makeup, thus increasing safety and effectiveness.

### *Chronic Diseases*

Health promotion and chronic disease management are high priorities for VA research.

Among the areas of study for VA researchers are:

- Developing and testing innovative diabetes care strategies, such as group visits, telemedicine, peer counseling, and Internet-based education.
- Investigating the biochemical pathways involving dopamine—a brain chemical implicated in Parkinson's disease—and testing a variety of treatment approaches for Parkinson's disease, including medication, surgery, and electrical stimulation.

- Probing the genetic and lifestyle causes of cardiovascular disease, and developing new rehabilitation methods, especially for stroke.
- Exploring potential drug therapies for the prevention and treatment of Alzheimer's disease and studying the best ways to provide long-term care.
- Researching the biological causes of cartilage degeneration and testing new drugs and other medical rehabilitation treatments for arthritis.

### *Vision and Hearing Loss*

VA researchers are developing new assistive devices for the visually impaired, including an artificial retina to restore vision, and studying ways to prevent, diagnose, and treat hearing loss.

### *Access to Care*

VA researchers are exploring organization of care, delivery methods, patient outcomes, and treatment effectiveness to help identify and eliminate any gaps in health care access for Veterans, especially those who may face special challenges because of their geographic location, gender, income level, culture, or race.

### *Homelessness*

For more than 20 years, VA has operated programs for Veterans who are homeless. VA researchers have been involved from the outset—evaluating effectiveness, comparing alternative strategies, and exploring new approaches. VA's programs in this area have been studied more extensively than any others, and today make up the nation's—and probably the world's—largest integrated network of homeless treatment and assistance services.

### *Pain Management*

Developing powerful new approaches to assess, manage, and treat chronic pain is a high priority for VA researchers. VA researchers are examining changes at the cellular and molecular levels in hopes of finding new ways to prevent or treat pain and inflammation.

### *Women's Health*

In recognition of the growing number of women Veterans, VA researchers are focusing increasing attention on women's unique health needs such as the cellular mechanisms involved in breast and cervical cancer; the role of hormones in stroke and aging; prosthetic designs specifically for women; PTSD-related challenges that are unique to women; and access to gender-appropriate services within VA.