

Veterans Affairs Research and Development: Using Science to Improve Health Care for Veterans

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The Veterans Affairs Office of Research & Development (ORD) is a congressionally mandated research program established in 1947 whose mission is to study all aspects of health and disease relevant to our nation's veterans. The Office of Research & Development consists of 4 research services including the Biomedical Laboratory, Clinical Science, Rehabilitation, and Health Services. The Biomedical Laboratory Research & Development Service conducts research that explores basic biological or physiological principles in humans or animals. The Clinical Science Research & Development Service (Clinical Science) conducts research that focuses on human subjects including interventional, clinical, epidemiological, and technological studies. Clinical Science houses the VA Cooperative Studies Program which has conducted landmark studies over the last 50 years that have established the effectiveness of new treatments for tuberculosis, hypertension, and coronary artery disease to name only a few. The Rehabilitation Research & Development Service conducts research exploring areas where technology can enhance or sustain veterans' independence. Lastly, the Health Services Research & Development Service pursues research at the interface of health care systems, patients, and health care outcomes. Its researchers examine all aspects of VA health care including access to care, adherence to quality of care standards, methods of improving quality of care and patient outcomes, the impact of health system organization on care, and cost of care. The Veterans Affairs Office of Research & Development is the only national research entity that is tied directly to a fully integrated health care system—the Veterans Health Administration. In fiscal year 2007 Congress appropriated \$480 million in direct funding for ORD. VA Research is an intramural program that funds only eligible VA employees through a rigorous merit review process.

The majority of funded VA researchers are also VA clinicians, and their research is conducted within VA. Veterans Affairs researchers are also very successful in obtaining non-VA, other federal, and foundation funds through competitive extramural grant programs. Veterans Affairs researchers also are faculty members at affiliated academic institutions.

VA's primary research mission is to investigate health issues that are of primary relevance to veterans. However, because the diseases and conditions studied in VA are also prevalent in the general population, VA research is widely relevant to civilian health. As such, Congress requires a continuing review of

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relevance and applicability. The VA research mission has gained importance given the burden of disease and injury in veterans. Research on chronic medical illnesses has dominated the research program for the last two decades reflecting the prevalence and burden of cardiovascular, neurological, and pulmonary diseases as well as cancer in the aging veteran population. With the more recent conflicts in Afghanistan and Iraq, VA has seen an

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influx of younger patients with both physical and mental trauma as well as other complex and chronic conditions. There has been a surge of interest in research designed to diagnose and treat these conditions. Congressional 2007 appropriations included \$32.5 million for research in areas of importance to these veterans including traumatic brain injury, sensory loss, spinal cord injury, and posttraumatic stress disorder.

Quality Enhancement Research Initiative

One unique feature of VA research is its close association with the health system. While most academic research programs are conducted by university-based independent investigators, VA researchers are tied more directly to the health care system and the patients they serve. As an example, in 1998 the VA Health Sciences R&D program launched the VA Quality Enhancement Research Initiative (QUERI).^{1,2} The QUERI mission is to enhance the quality and outcomes of VA health care by systematically implementing clinical research findings and evidence-based recommendations into routine clinical practice. In evaluating quality of care, the QUERI process focuses on 3 elements: structure (provider and organizational characteristics), process (practitioners' clinical actions toward patients), and outcome (health status, economic impact, satisfaction). The Quality Enhancement Research Initiative is founded on the principle that practice needs determine the research agenda, and research results determine interventions that improve the quality of patient care. It is a comprehensive, data-driven, outcomes-based quality improvement program that utilizes a 6-step process to facilitate the implementation of research findings and evidence-based clinical practices to achieve better health care outcomes for veterans. Steps in the QUERI process are:

1. Identify high-risk/high-volume diseases or problems.
2. Identify best practices.
3. Define existing practice patterns and outcomes across VA and current variation from best practices.
4. Identify and implement interventions to promote best practices.
5. Document that best practices improve outcomes.
6. Document that outcomes are associated with improved health-related quality of life.

The Quality Enhancement Research Initiative focuses on 9 diseases and conditions that are prevalent among veterans. These include chronic heart failure, diabetes, HIV/hepatitis, ischemic heart disease, mental health problems, polytrauma and blast related injuries, spinal cord injury, stroke, and substance abuse. Functionally, there is a research coordinator and a clinical coordinator as well as a cadre of experts for each of the 9 QUERI areas. These 9 focused groups of experts develop strategic plans and form collaborations with VA central, regional, and health center-based facilities across the country to develop and conduct projects to improve quality of care to veterans.

Operation Iraqi Freedom/Operation Enduring Freedom

VA Research & Development has made working to address the health care needs of our military returning from conflicts in Iraq and Afghanistan a top research priority. VA investigators are working on developing new knowledge, effective tools, and innovative ways to evaluate and treat polytrauma, mental health issues such as depression and post traumatic stress disorder, spinal cord injury, traumatic brain injury, amputations and prosthetics, and burns.

Veterans Affairs Research in North Carolina

In North Carolina, the Durham VA Medical Center has one of the oldest and largest research programs in all of VA. From its founding date in 1953, all clinical faculty have been recruited to VA with dual academic appointments at Duke University, and key leadership positions in VA have been staffed by clinician scientists. Thus the clinical expertise of VA was tied closely to the research mission. Throughout its history Durham VA has provided significant basic, clinical, and health services research training opportunities for both PhD trained and clinician scientists in the form of fellowships and postdoctoral programs as well as career development and enhancement programs. The VA medical centers in Asheville and Salisbury, North Carolina maintain smaller research programs.

In 1981 the Health Services Research Program at Durham VA was funded as one of the initial national Field Programs in Health Services. It has grown into one of the largest Centers of Excellence in Health Services Research now focusing on issues relevant to access, quality, and outcomes of primary care for veterans. The Durham Epidemiology Research and Information Center was established in 1990 as 1 of 3 national epidemiology centers in VA. Its areas of expertise are in neuroepidemiology and genomics. There are several examples of clinically relevant research in North Carolina including amyotrophic lateral sclerosis, managing hypertension outside a clinic, and posttraumatic stress disorder.

Amyotrophic Lateral Sclerosis

Amyotrophic lateral sclerosis (ALS) is an adult-onset, fatal neuromuscular disease involving progressive degeneration of upper and lower motor neurons with clinical manifestations including muscular weakness, atrophy, and spasticity with exaggeration of tendon reflexes. Concern about potential environmental exposures in the context of military service in the 1990-1991 Gulf War was an important factor in the formulation of the ALS Gulf War study run by investigators at the Durham Veterans Affairs Medical Center (VAMC).^{3,4} In an effort to stimulate both etiologic and therapeutic research on ALS in veterans, the VA Cooperative Studies Program developed a National Registry of Veterans with ALS.⁵ The objectives of the registry are to identify living US military veterans with ALS, track their health status and disease progression over time, collect data (including DNA) that will be available for multiple epidemiologic studies of ALS, and provide a mechanism for

informing veterans with ALS about clinical trials for which they may be eligible. This VA registry is the largest fully specified cohort of patients with ALS worldwide with over 2400 patients now enrolled, 1200 of whom have provided DNA samples for future research. Because ALS is a relatively rare disease, it is often difficult to identify sufficient numbers of patients for important epidemiologic and genetic studies. It is VA's hope that the resource created in the registry will lead to important discoveries for patients with this lethal disease. To date, over 20 different investigators (both VA and non-VA) have received access to this important resource.

Managing Hypertension Outside the Clinic

Hypertension is the most common reason for primary care clinic visits both at VA and nationally. Because a significant proportion of civilian and veteran patients remain above evidence-based targets for blood pressure control, researchers at Durham VA have designed and tested a multicomponent intervention that promotes patient self-management by establishing practices around adherence to best behaviors and medication management.^{6,8} This multicomponent intervention uses a combination of telehealth blood pressure monitoring devices, scripted text delivered by nurses, and medication changes initiated and monitored centrally by physicians. The main goal of this research was to move the management of hypertension outside the context of a clinic visit and into the patient's home. A series of studies have established the safety of this method of care, and ongoing research is addressing its effectiveness. Elements of this system are being tested in a pilot project in North Carolina's Medicaid population.

Posttraumatic Stress Disorder

Posttraumatic stress disorder (PTSD) is a serious and prevalent problem in veterans. While PTSD has clearly been present in all wars and conflicts, our understanding of the long-term

consequences of this illness did not emerge until after the Vietnam War. VA investigators have led the nation by conducting research designed to better understand the etiology, diagnosis, and treatment of PTSD. A recent study established that as many as one-third of veterans returning from conflicts in Iraq and Afghanistan experience some psychological problems, half of whom are diagnosed with PTSD.⁹ While much of current treatment is focused on patients reexperiencing the traumatic event that precipitated the disorder, researchers at Durham VA are examining the potential benefits of a treatment called "guided imagery." In a novel study that compares the effectiveness of soothing music alone to the effectiveness of tailored audio instructions and soothing music treatment delivered in the veteran's home using a dedicated personal digital assistant (PDA), researchers will discover if guided imagery will allow veterans with this debilitating disorder to achieve symptom resolution and enhanced quality of life. If the intervention proves to be successful, it is likely to be a very cost-effective treatment modality for the growing number of veterans with PTSD.

Summary

VA has a rich tradition in supporting research in areas that span basic science to health system implementation. Its unique success is tied to the fact that researchers are focused on issues that arise from a unique population—our nation's veterans. Moreover, because VA is the largest integrated health system in the country and because the health system must manage an annual budget, there is a keen interest among VA health administrators to apply research that enhances quality and efficiency of care. Furthermore, because these findings overlap with the general population, VA Research & Development programs can be applicable on a much broader scale. **NCMJ**

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