Defining Gulf War illness

Many Veterans of operations Desert Shield and Desert Storm, which took place in 1990 and 1991, returned home with a number of health problems. Common symptoms include chronic fatigue, joint and muscle pain, memory problems, respiratory difficulties, digestive problems, and skin rashes. A single condition encompassing all these symptoms has been difficult to diagnose and define.

VA launches precision oncology pilot

VA’s New England Healthcare System (VISN 1) and the Massachusetts Veterans Epidemiology Research and Information Center (MAVERIC) have instituted a clinical program to help VISN 1 Veterans who have been newly diagnosed with non-small cell lung cancer.
New Initiatives

Defining Gulf War illness
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Because of the complicated and multifaceted nature of these health problems, VA asked the Institute of Medicine (IOM) to review the case definitions that have been proposed for the illness. Case definitions are sets of uniform criteria used to define a disease for public health surveillance, allowing public health officials to classify and count cases consistently across reporting jurisdictions.

Illnesses reported by Gulf War Veterans have been called a variety of names over the years, but IOM recommended in its report that VA and others use the term “Gulf War illness” going forward. The report also recommended that VA researchers and clinicians use case definitions created by the U.S. Centers for Disease Control and Prevention (CDC) or the Kansas Persian Gulf War Veterans Health Initiative.

VA’s Office of Research and Development (ORD) has now decided to use the CDC and Kansas definitions for the condition. Going forward, ORD will use the term “Gulf War illness presenting as chronic multisymptom illness.” Dr. Robert Jaeger, director of deployment health research for VA, notes: “As in the past, terminology continues to evolve. There are many other considerations within VA that must be resolved with respect to this terminology.”

VA researchers are continuing to learn about these conditions and identifying the best ways to diagnose and treat them. Funding for this research 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 reviewed periodically and updated to make sure it incorporates the latest knowledge.

VA launches precision oncology pilot
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As these patients are newly diagnosed, network physicians will take a specimen of their tumor and send it to qualified laboratories for targeted genomic sequencing, a process that determines the DNA sequence of genes that are considered important in lung cancer.

The sequencing will identify the specific mutations, or changes, that are causing the Veteran’s lung cancer cells to exist and grow, enabling doctors to take better care of these patients. While hundreds of such mutations exist, each patient’s cancer has a unique combination of them. A number of mutations lead to alterations in the cancer that can now be specifically targeted by drugs approved by the Food and Drug Administration for treatment of patients with lung cancer.

VA researchers will also use the genomic sequencing information they obtain to offer Veterans opportunities to take part in clinical trials of new drugs targeted toward their specific mutations, and to add their data to repositories helping scientists to continue unlocking the mysteries of cancer.

Once the program is well underway, VISN 1 expects to expand genomic sequencing testing to all forms of cancer, and hopes such testing will begin to take place at all VISNs nationwide.
nation hold open houses and other activities. These activities recognize Veterans for their participation in research studies. They also enable VA investigators to present findings from discoveries and innovations that have led to advancements in Veterans’ health care and improved on existing medical knowledge.

Some of those researchers will present their findings on supporting and improving chronic disease management efforts for Veterans and their families, which is among the highest priorities of VA research.

Among the chronic diseases of particular interest to VA researchers is diabetes, which affects nearly a quarter of VA patients. Our investigators are developing and testing innovative diabetes care strategies and technologies to enhance access to diabetes care and to improve outcomes for patients. Strategies currently being evaluated to prevent or treat diabetes include group visits, telemedicine, peer counseling, and Internet-based education and case management.

Some of the key work in this area is taking place through VA’s Diabetes Quality Enhancement Research Initiative (QUERI), based in Ann Arbor, Mich. This group is committed to implementing promising research findings into clinical practice.

In addition, VA researchers are working with special populations in which the risk of diabetes, or for severe diabetes complications, is especially high. These include the elderly, amputees, minorities, spinal cord injured patients, and those with kidney or heart disease.

Other VA researchers are developing new treatments for cardiovascular disease and working to improve existing treatments. They are looking at the genetic and lifestyle causes of the disease, and finding new ways to help stroke victims and other patients recover as much function as possible after cardiovascular events.

VA’s very first centrally funded research laboratory was the department’s tumor research unit, set up in Hines, Ill., in 1932. The unit did some of the first studies on the link between smoking and lung cancer, an issue VA researchers have continued to explore over the years. Today, VA’s cancer investigators conduct laboratory experiments aimed at discovering the molecular and genetic mechanisms involved in cancer; studies looking at the causes of disease; and clinical trials to evaluate new or existing treatments.

VA investigators are also looking at potential approaches for treating and preventing mental health disorders. In addition, they are studying related issues such as developing and evaluating collaborative primary care models, and improving access to services from remote areas by using the Internet and other technologies.

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 use education to put new knowledge into routine clinical practice in VA. Specialized mental health centers of excellence are an essential part of VA’s ability to meet Veterans’ mental health needs.

This issue of VA Research Quarterly Update will provide you with information on our efforts on behalf of Veterans who have developed lifelong chronic medical conditions, many resulting from their service in uniform. We intend to continue to provide VA clinicians and our Veterans with information on the best evidence-based practices for chronic disease management available anywhere.

Happy VA Research Week 2015!

**Timothy O’Leary, M.D., Ph.D.**
Chief Research and Development Officer
The legacy and lessons of the VA Diabetes Trial

In January 2009, a team of VA researchers published a study in the New England Journal of Medicine titled “Glucose Control and Vascular Complications in Veterans with Type 2 Diabetes.” In that large randomized clinical trial, funded by the VA Cooperative Studies Program and known as the VA Diabetes Trial (VADT), investigators tried to determine whether intensive levels of glucose control were beneficial to patients—specifically, whether they could help ward off heart attacks, stroke, and other cardiovascular events.

The initial study helped confirm that tight glucose control can be achieved safely in most patients; however, patients with long-standing diabetes and at high risk for cardiovascular disease (CVD) experienced only a modest benefit in reducing their CVD over a five- to six-year period. This provided support for the idea that glucose control needs to be personalized, and that clinicians need to better identify those who are likely to benefit from intensive control of their glucose levels, and be more judicious in recommend-

Reaven: The VADT was a randomized clinical trial of intensive glycemic control in patients with long-standing and relatively advanced diabetes. These patients were at relatively high risk for cardiovascular disease—and, in fact, many of them already had one form or another of cardiovascular disease when they were enrolled into the study.

The study involved 1,791 individuals from 20 VA sites around the country. There was a good geographic distribution of sites, and the study cohort had a relatively reasonable representation of African Americans and other ethnic groups, such as Hispanics. Obviously, because it was a Veteran population, the number of women was relatively low, and therefore the results are less generalizable to women.

The treatment goal was a comparison of glucose lowering to a median hemoglobin A1c level of just below 7 for those randomized to the more aggressive group, versus an 8.4 for those who were randomized to the standard glucose control group. [Hemoglobin
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.

The types of medication taken were relatively similar for the two groups, except that the dose or frequency of use of the medications was increased for the aggressive treatment group. VADT therefore became a legitimate comparison of glucose control as opposed to medication category, and that is an important aspect of the trial—because other trials were less rigorous regarding the categories of medications used in the two treatment groups. That leaves open the possibility there may have been differences in the two treatment groups in other trials that were medication-specific, rather than related to glucose-lowering.

In contrast to the different glucose-lowering intervention efforts, the two treatment groups had equally well-optimized blood pressure and blood lipid [cholesterol and triglyceride] control. Other preventive medications, such as aspirin, were similarly used in both groups. Again, the effort was to try to isolate the consequences of improved glucose control as opposed to other risk-reducing interventions.

**VARQU: What do you see as VADT’s most significant accomplishments?**

**Reaven:** The results, which have been published in several manuscripts, have pointed to the fact that glucose control was substantially better in the intensively treated group, with a median difference in A1c of about 1.5 percent between treatment groups. The blood pressure and lipid control was quite good in both groups, and was consistent with prevalent treatment guidelines.

The outcomes in terms of cardiovascular disease [a composite of common vascular events in type 2 diabetes] were somewhat surprising, in that there was a modest but not statistically significant 12-percent reduction in cardiovascular events in the intensive control group.

There was no clear difference between groups among individual components of cardiovascular outcomes, and no increase or decrease in mortality. This latter finding is different compared with what was found in the Action to Control Cardiovascular Risk in Diabetes [ACCORD] study [sponsored by the National Heart, Lung, and Blood Institute], which did show an increased risk for mortality in the intensively treated group.

So our results demonstrated that intensive glycemic control as conducted in the VADT did not increase mortality, but showed only a trend for a modest favorable effect on total cardiovascular events. The latter conclusion is consistent with the overall results of two other major studies that were published in a similar time frame—ACCORD [which found a reduction in nonfatal heart attacks, notwithstanding a higher overall death rate in the intervention group] and the Action in Diabetes Control and Vascular Outcomes [ADVANCE] study [an international study on intensive glycemic treatment].

Also somewhat surprising in our study was the microvascular [minute blood vessel] outcome data, which showed, again, only modest improvement in the amount of urine protein for those in the intensive control group—with no real difference in clinically important endpoints, such as the development of renal failure, the doubling of creatinine [a chemical waste product filtered by the blood through the kidneys], neuropathy [weakness, numbness, and pain from nerve damage], and diabetic retinopathy [a condition causing progressive damage to the retina].

Overall, the results indicated that tight glycemic control for a period of 5.6 years had only modest and not statistically significant effects on cardiovascular outcomes, and very modest effects on microvascular outcomes.

There were some indications that those with less advanced disease, people who had had diabetes for a shorter time before their enrollment in the study,
and those with less vascular calcification appeared to gain greater benefit from intensive glycemic control. This appears consistent with data coming out from other studies, and was consistent with prior data from the United Kingdom Prospective Diabetes Study [UKPDS, a 20-year study concluded in 1997], in which new diabetes patients were also shown to have improved cardiovascular outcomes in response to improved glucose control.

**VARQU: What does the follow-up to the original trial involve?**

**Reaven:** The VADT results beg the follow-up question: If during the course of five or six years of intensive control the effect is relatively modest, what happens over a greater time? Will the improvements in glucose control over this earlier period lead to long-term improved consequences? That’s the basic question the VADT follow-up hopes to answer.

The way we are pursuing that is through central database collection of information on the VADT cohort for over nine years of additional follow-up after the end of the VADT study, when these patients were turned over to general diabetes care in various clinics in VA facilities throughout the country. We are tracking a limited set of cardiovascular disease and microvascular disease outcomes through the electronic record systems. This involves not only VA’s health care system records but also several national databases that can be accessed for this type of information.

We are following a fairly similar, but more limited, set of cardiovascular composite outcomes. We are also following renal disease outcomes through measurements of creatinine and estimates of the glomerular filtration rate [GFR], which is an important indicator of how well kidneys are working. The plan is to follow the original VADT cohort for an additional nine years after the completion of the VADT study. To date, there have been approximately five years of post-VADT data collected, with four more years of follow-up planned.

The initial interim data after approximately 10 years since the beginning of the study have been analyzed and are in review for publication [Editor’s note: publication expected in June 2015]—and we will then be following up with a more comprehensive report after approximately 15 years of studying the VADT cohort.

**VARQU: What do you hope VADT’s legacy will be for other researchers, for Veterans, and for Americans with diabetes?**

**Reaven:** We hope the legacy is that we have conducted one of the more definitive studies of glucose control, cardiovascular events, and microvascular disease complications. We believe that this well-conducted study, with its unique long-term follow up, will provide the necessary information that truly allows care providers to make the appropriate decisions regarding how to institute intensive glycemic control: how long is it necessary; who may benefit from this; and who should, perhaps, be treated more conservatively, to avoid serious adverse events, with the knowledge that not all individuals will benefit from intensive glycemic control.

I think it is important to acknowledge that the group of individuals that began the study is unique. They were relatively far along in the diabetes process, with a duration of 10 years or more on average, and at high risk of cardiovascular disease. That does not represent all patients with diabetes, and so our data and results need to be interpreted with that information about the cohort in mind.
Bariatric surgery can cut the risk of early death in patients with severe obesity—

Bariatric surgeries, which include a number of different procedures performed on the stomach or intestines to induce weight loss, do more than help obese people shed pounds they cannot otherwise lose. They also help severely overweight patients live longer, according to a recent VA study published in the *Journal of the American Medical Association*.

The retrospective cohort study, which involved 10,000 VA patients throughout the nation, found that the 2,500 Veterans who had had the surgery had a 53-percent lower risk of dying from any cause at 5 to 14 years after the procedure, compared with the 7,500 matched control patients who had not. While previous studies had shown that younger, mostly female populations had improved their survival rates, the current study population was older, with a mean age of 52, and was 74-percent male.

In addition, 55 percent of those in the VA study had diabetes, and many had other diseases such as high blood pressure, arthritis, heart disease, and depression.

“We also found evidence that bariatric surgery has become safer,” Dr. Matthew Maciejewski of the Durham VA Medical Center and Duke University said in a news release from the Group Health Research Institute. “We found that the risk of dying during and soon after bariatric surgery was lower in 2006 – 2011 than in 2001 – 2005.”

The research team now hopes to find answers to additional questions about various forms of bariatric surgery, including whether it helps certain subgroups of Veterans more or less. They also hope to learn how long weight loss lasts after surgery, and at what level; whether the course of diseases associated with obesity, such as diabetes, is changed; and what the effects are of the surgery on total health care costs in the long run. (*Journal of the American Medical Association*, Jan. 6, 2015)

Some men treated for testicular cancer may be at increased risk of developing stomach cancer—Testicular cancer typically develops in one or both testicles in young men, but it can occur in older men as well. According to the American Cancer Society, it is a highly treatable and usually curable type of cancer.

Treatment options for testicular cancer typically focus on chemotherapy, surgery, or radiation therapy, which involves the treatment of the cancer by means of X-rays or radioactive substances. Radiation is less often used to treat testicular cancer today than it was in the past, and when it is used, it is much more targeted and involves lower radiation doses than previously.

An international study involving researchers from the Oklahoma City VA Medical Center looked at more than 22,000 men who were diagnosed with testicular cancer between 1959 and 1987, when radiation doses were higher and less well-targeted. All of the study participants lived at least another five years after being treated for the disease.

The study found that those who had received any level of radiation therapy had nearly six times the risk of developing stomach cancer, compared with those who had not had any radiation at all. And those who had received very high doses of radiation were at nearly 20 times the risk.
The authors hope these findings will get clinicians to look quickly for the possibility of stomach cancer when their patients who have been treated for testicular cancer come to them with gastrointestinal problems, and when doctors consider the possibility of treating new patients with radiation therapy. (British Journal of Cancer, Jan. 6, 2015)

A new view of nonobstructive coronary artery disease—In coronary artery disease (CAD), a waxy substance called plaque builds up inside the coronary arteries, which supply oxygen-rich blood to the heart muscle. CAD is the leading cause of death in the United States in both men and women.

Nonobstructive CAD occurs when those deposits do not obstruct the blood flow to the heart. Such deposits are found in 10 to 25 percent of patients who are given a coronary angiogram, an imaging test that uses X-rays and a special dye to see inside the arteries. Angiograms are typically done for patients who are complaining of chest pain or shortness of breath, or who have failed cardiac stress tests.

According to The New York Times, “Historically, doctors have considered the partial obstructions insignificant, and a surprisingly large percentage of patients with them are sent home without treatment.” A new VA study, however, indicates that nonobstructive CAD should not be ignored, especially among patients who are showing symptoms of heart disease.

A team led by researchers from the VA Eastern Colorado Health Care System and the University of Colorado gathered data on 37,674 Veterans who underwent elective angiograms at VA between October 2007 and September 2012. Of those, 22 percent had nonobstructive CAD.

As expected, the risk of having a heart attack or dying within one year was greatest among the 55 percent of Veterans in the study with obstructive coronary disease (those with a blockage equal to or greater than 70 percent in one or more coronary arteries). But those with nonobstructive CAD in even one artery had twice the risk of suffering a heart attack of those without any trace of CAD, and the risk was more than four times greater if they had nonobstructive disease in two or three arteries. The death rate increased with the extent of nonobstructive disease.

Dr. Thomas M. Maddox, the study’s lead author, told the Times that patients should not consider a diagnosis of nonobstructive CAD “good news,” and that “if an angiogram shows a blockage of 30, 40, or 50 percent in one or more arteries, the patient should be on preventive therapy,” such as daily baby aspirins and statins. (Journal of the American Medical Association, Nov. 5, 2014)

HSR&D completes four new evidence-mapping projects—Evidence mapping is a recently developed methodology that provides clinicians with an understanding of the extent and distribution of the currently available evidence on a clinical topic. The maps highlight both what is known and where gaps in evidence exist, with the aim of speeding the implementation of practices supported by strong evidence, and highlighting those areas that require further study.

Recently, VA’s Health Services Research and Development (HSR&D) service completed four evidence maps relating to complementary and alternative medicine or integrative medicine modalities: mindfulness, tai chi, yoga, and acupuncture.

Although many different forms and definitions...
of mindfulness exist, basically the term refers to the intention to be more aware and engaged in the present moment. In preparing an evidence map on the subject, researchers found that depression was the area in which the most consistent beneficial effects were seen for various mindfulness interventions, and that mindfulness-based stress reduction programs were better than no intervention at all for chronic illness and for overall health and psychological outcomes. Mindfulness-based cognitive therapy had beneficial effects for mental illness, and many mindfulness interventions helped people with sleep disorders.

Tai chi is a Chinese exercise system that uses slow, smooth body movements to achieve a state of relaxation of both body and mind. HSR&D’s evidence map reviewed previous studies for tai chi’s effect on pain, PTSD, and fall prevention. Researchers found statistically significant beneficial effects for hypertension, falls outside of institutions, cognitive performance, osteoarthritis, chronic obstructive pulmonary disease, pain, balance confidence, depression, and muscle strength. They cautioned, however, that firm conclusions cannot be drawn, given the methodological limitations in the original studies, and the insufficient number of studies.

Yoga includes breath control, simple meditation, and physical exercise involving specific body postures. It is widely practiced for health and relaxation. The investigators who prepared the yoga evidence map suggested that yoga can improve functional outcomes in patients with nonspecific chronic low back pain, but that the existing evidence is less clear about the effectiveness and safety of yoga for other conditions of interest, including depression and other common chronic health conditions in Veterans.

Acupuncture, which originated in China, is the practice of inserting fine needles through the skin at specific points to cure disease or relieve pain. Researchers preparing the acupuncture evidence map found that the available published literature on acupuncture is extensive. However, rigorous, consistent evidence of positive effects across any area was limited. The researchers note that higher-quality studies are only beginning to emerge, and further research is needed.

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In the News

Nasal spray with synthetic insulin shows promise for Alzheimer’s dementia—The *Winston-Salem Journal* reported that a synthetic form of insulin delivered by nasal spray may improve working memory and other mental capabilities in adults with mild cognitive impairment and Alzheimer’s disease dementia.

The paper reported on a study funded by VA and the National Institute of Aging in which 60 adult subjects took part. Twenty of the subjects received a placebo, and the other 40 were given insulin detemir, a synthetic version of human insulin, through a nasal spray. Of those, about half received 20 doses, and the other half received 40 doses, over a 21-day period.

The adults who received 40 doses for 21 days showed the most improvement in their short-term ability to retain and process verbal and visual information, and adults in that group who had a gene known to increase the risk of Alzheimer’s had higher memory scores than the other subjects.

VA has conducted previous trials using insulin delivered by a nasal spray for adults, but, as far as the researchers could determine, this study is the first to use insulin detemir, which tends to be longer-lasting than regular insulin.

New cells may help treat diabetes—Researchers at the Iowa City VA Health Care System and the University of Iowa have created human-insulin producing cells that respond to glucose and correct blood-sugar levels in diabetic mice, reported KGAN-TV and other news sources.

The researchers took human skin cells and reprogrammed them to create induced pluripotent stem (IPS) cells, which were then coaxed into forming insulin-producing cells. When these cells were transplanted into diabetic mice, the cells secreted insulin and reduced the blood sugar levels of the mice to normal or near-normal levels.

Although the cells were not as effective as pancreatic cells starting with human skin cells, VA researchers and colleagues in Iowa were able to produce insulin-producing cells.
In the News

Honorable Mentions

Researcher receives Daniel Deykin award for mentorship efforts—HSR&D has announced that Dr. Mark Kunik is the first recipient of its Daniel Deykin Award for Outstanding Mentor. Kunik is the associate director of VA’s Center for Innovations in Quality, Effectiveness, and Safety at the Michael E. DeBakey VA Medical Center in Houston, and is also the director of VA’s South Central Mental Illness Research, Education, and Clinical Center (MIRECC).

Kunik began his research career 15 years ago, with an HSR&D Career Development Award. Since then, he has mentored and enhanced the careers of more than 75 others, including residents, clinical fellows, research fellows, and medical students.

New blood test to diagnose Alzheimer’s found to be feasible—A recent study by researchers with VA, UCLA, and other institutions provided evidence that a simple blood test can be developed to confirm the presence of beta amyloid proteins in the brain, a hallmark of Alzheimer’s disease. The story was covered by CBS Los Angeles and other media outlets.

Although some 5 million Americans are living with Alzheimer’s, there is no reliable blood-based test to indicate the presence of the disease. At present, Alzheimer’s disease can be definitively diagnosed only by examining brain tissue after death. While people are alive, physicians must rely on proxy measures, or biomarkers, along with cognitive symptoms such as memory loss.

The study team developed a simple signature to predict the presence of brain amyloidosis (the buildup of amyloid in the brain) that included several blood proteins known to be associated with Alzheimer’s disease, along with clinical information such as results of memory testing and MRI scans.

Using blood samples and other data from patients with mild cognitive impairment from the Alzheimer’s Disease Neuroimaging Initiative—a public-private partnership started by VA, NIH, and others in 2004—the research team found their method could be used to predict the presence of amyloid in the brain with modest accuracy.

Although there is no treatment that can halt or reverse the progression of Alzheimer’s disease, a non-invasive, inexpensive, and reliable test for diagnosing the disease could spare people with dementia and their families the anxiety associated with uncertainty, direct them to support services earlier, and improve their likelihood of benefiting from current and future advances in treatment.

For more 'In the News', see the online version of VARQU at www.research.va.gov/pubs/varqu
Kunik’s mentoring skills and willingness to devote his time to supporting others’ careers exemplifies the “human capital pipeline” that Dr. Deykin and his colleagues created, incorporating a strong mentoring component to the organization to ensure VA will continue to have an infusion of talented young researchers dedicated to improving Veterans’ health care.

The Daniel Deykin award is presented annually to an HSR&D researcher who exhibits outstanding dedication and skill in mentoring the next generation of researchers, particularly in guiding them toward a thorough understanding of the positive impact research can have on the health and care of Veterans. Kunik is the first recipient of this award.

**Best research paper of the year award given to Seattle HSR&D researcher**—Dr. Karin Nelson, a researcher with HSR&D’s [Center of Innovation for Veteran-Centered and Value Driven Care](https://hsrd.bwh.harvard.edu/) in Seattle, is the first recipient of the HSR&D’s Best Research Paper of the Year Award.

Nelson’s article titled “Implementation of the Patient-Centered Medical Home in the Veterans Health Administration: Associations with Patient Satisfaction, Quality of Care, Staff Burnout, and Hospital and Emergency Department Use” was published in *JAMA Internal Medicine’s* August 2014 issue. The article described a process to track the effect of implementing patient centered care teams throughout VA over time, and to evaluate outcomes at VHA primary care clinics.

Her work was chosen for several reasons: its relevance to VA and to health systems in general; its rigorous methodology; the utility of its results; and their rapid adoption within VA.

The new annual award will honor a single article or collection of articles resulting from one or more HSR&D or QUERI funded investigations. To be eligible, research studies must involve Veterans and demonstrate results that are important to Veterans’ health and care and to the VA health care system.

**Two VA researchers named AAAS fellows**—Two VA researchers are among the latest class of fellows named by the [American Association for the Advancement of Science](http://www.aaas.org/) (AAAS).

Dr. Lynn Eleanor DeLisi, is a psychiatrist with the VA Boston Healthcare System and Harvard Medical School. Her main interest is schizophrenia. DeLisi was a co-founder of the journal *Schizophrenia Research* in 1988, and has served as co-editor of the journal ever since. She was also cofounder of the *Schizophrenia International Research* Society in 2003.

In a current VA-funded project, she is using MRI brain scans in an attempt to identify biomarkers to speed early detection and treatment for the disease.

Dr. Don Rubin is the associate chief of staff for research at VA’s Tennessee Valley Healthcare System. An infectious disease specialist, he is also professor of pathology, microbiology, and immunology at Vanderbilt University Medical Center.

Rubin’s research has focused on the cellular and molecular aspects of viral infection in the digestive tract and liver. His work has led to the development of an exciting technology to sort out cellular genes that participate in cellular infection.

The AAAS, publisher of *Science* magazine, is an international nonprofit organization dedicated to advancing science for the benefit of all people. In 2014, it named 401 of its members as fellows. The honor is given for contributions to innovation, education, and scientific leadership.

For more "Honorable Mentions," see the online version of VARQU on our website: [www.research.va.gov/pubs/varqu](http://www.research.va.gov/pubs/varqu)