



# VA Research Currents

## Communicating science to public is key, says speaker at national meeting

Veterans Affairs investigators and their colleagues must tackle exciting new initiatives and communicate their findings effectively to the public if the federal government is to spend more on research, said Duncan Moore, PhD, in his keynote address at VA's 2001 National Research and Development Conference, Oct. 29-31 in Keystone, Colo.

"Simply saying 'science is good' is not enough," said Dr. Duncan. "If we want to substantially increase the federal science budget we must find initiatives that are compelling, such as information technology and nanotechnology."

Dr. Moore, a professor of optical engineering at the University of Rochester and former associate

director of technology in the White House Office of Science and Technology Policy, told some 300 VA researchers and research administrators that they and their colleagues must also

**"We must find initiatives that are compelling. ..."**

show the public how scientific advances will help them. Science must be put "into a context Rotary Club people can understand in significant ways," said Dr. Moore.

Dr. Moore said one barrier to advancing science and technology is declining enrollment in college engineering programs, along with a shortage of science and math teachers in the

nation's schools. He urged scientists to bring faculty from schools of education into their laboratories to increase their understanding of science.

"As a national objective, if we could get kids graduating from high school who are at least *neutral* toward science and math, we would be doing a great service," he said. "We've got either a crisis in the making or a great opportunity."

The conference also included addresses by John R. Feussner, MD, MPH, VA's chief research and development officer, and other national leaders of VA research. Dr. Feussner said comments from outside VA are one indication of the excellence of the VA research program. He pointed to the

see **MEETING** on pg. 4

*Update from Rehabilitation Research and Development...*

## VA prosthetics goal: More than 'nifty ideas' and 'gee-whiz' components

By Mindy Aisen, MD, Director, RR&D

We point with pride to VA Research's significant contributions in the field of prosthetics—the VA-Seattle Limb System, the application of CAD-CAM (Computer Design and Manufacture) to artificial limbs, and the AdVantage Arm. However, as a research enterprise, we can never rest on our laurels, and it is time for the field of prosthetics to advance again.

The discoveries of the last decades can be attributed to creative minds applying emerging materials and computer technology to a specific problem—the need for improved function after amputation. This resulted in improved fit and responsiveness to a person's gait.

The emerging technologies of today include tissue engineering, MicroElectroMechanical Systems, and robotics. Although perfecting their application in prosthetics is still a future hope, these concepts hold out the promise of more accurately mimicking natural gait and providing increased comfort. And with each application comes the need for evidence—not that this is a nifty concept, but that, in fact, it is an *improvement* and will add to quality of life. Some work in these areas is occurring in VA labs, but more needs to be encouraged if we are to lead the field.

There is a school of thought, with some preliminary

see **PROSTHETICS** on pg. 3

## Recent publications

*Below is a sampling of recent publications and presentations by VA investigators. Due to space constraints, only VA authors and affiliations are noted.*

“Assessing Care of Vulnerable Elders (ACOVE): A Project Overview.” Paul G. Shekelle, MD, PhD, and the ACOVE Investigators. **Greater Los Angeles.** *Annals of Internal Medicine*, Oct. 16, 2001.

“Depressive Symptoms, Menopausal Status, and Climacteric Symptoms in Women at Midlife.” Hayden B. Bosworth, PhD; Lori A. Bastian, MD. **Durham.** *Psychosomatic Medicine*, July/Aug. 2001.

“Effects of Two Atypical Neuroleptics, Olanzapine and Risperidone, on the Function of the Urinary Bladder and the External Urethral Sphincter in Anesthetized Rats.” Pedro L. Vera, PhD; Irving Nadelhaft, PhD. **Bay Pines (Fla.).** *BMC Pharmacology*, Aug. 2001.

“Health Barriers to Walking for Exercise in Elderly Primary Care.” Karen M. Cooper, RN; Deborah Bilbrew, RN; Patricia M. Dubbert, PhD; Kent Kirchner, MD. **Jackson (Miss.).** *Geriatric Nursing*, Sept./Oct. 2001.

“Health Status and Satisfaction with Health Care: A Longitudinal Study Among Patients Served by the Veterans Health Administration.” Xinhua S. Ren, PhD; Lewis Kazis, ScD; Austin Lee, PhD; Susan Pendergrass, PhD. **Bedford (Mass.)** *American Journal of Medical Quality*, Sept./Oct. 2001.

“Psychiatric Care Management for Chronic Addictive Disorders: Conceptual Framework.” Mark L. Willenbring, MD. **Minneapolis.** *American Journal of Addictions*, Summer 2001.

“A Reusable, Self-Adhesive Electrode for Intraoperative Stimulation in the Lower Limbs.” Ronald J. Triolo, PhD. **Cleveland.** *VA Journal of Rehabilitation Research and Development*, Sept./Oct. 2001.

“VA and Schizophrenia: Great Potential, Many Challenges” (editorial). Scott R. Sponheim, PhD. **Minneapolis.** *Veterans Health System Journal*, Aug. 2001.

## Upcoming events

• **VA’s Clinical Research Methods Course** will be held April 8 – 12, 2002, in Santa Fe, N.M. The course teaches the basics of designing and conducting a scientifically valid study. For details call William Henderson, PhD, director of the Hines (Ill.) VA Cooperative Studies Coordinating Center, at (708) 202-5853 or e-mail him at Henderson@research.hines.med.va.gov.

• **Health Services Research and Development** will hold its 25th anniversary celebration and 2002 annual meeting Feb. 13 – 15 in Washington, D.C. For details set your Internet browser to [www.va.gov/resdev/fr/frmtngs/mtng.cfm](http://www.va.gov/resdev/fr/frmtngs/mtng.cfm)

• **Rehabilitation R&D’s 2002 national meeting** will take place Feb. 11 and 12 in Washington, D.C. For details, check the Rehabilitation R&D website at [www.vard.org](http://www.vard.org).

## Publications of special note...

• “Continuity of Care, Stages of Change for Self-Management Behaviors and Glucose Control Among Patients with Type 2 Diabetes,” co-authored by Jacqueline A. Pugh, MD, and Polly Hitchcock Noel, PhD, of the Veterans Evidence-Based Research Dissemination and Implementation Center (VER-DICT) at the **South Texas Veterans Health Care System**, was selected as one of six “Distinguished Papers” at the 29<sup>th</sup> annual meeting of the North American Primary Care Research Group, held last month in Nova Scotia. The study examined continuity of care for diabetes patients at five community health clinics along the Texas-Mexico border and found that continuity of care is associated with improved glucose control. According to Dr. Noel, “This relationship appears to be mediated by changes in patient behavior regarding diet.”

• Francisco C. Ramirez, MD, of the **Phoenix VA Medical Center** received the American College of Gastroenterology Governors Award for Excellence in Clinical Research at the group’s annual meeting in Las Vegas last month for his paper titled “NSAID Users Exhibit Attenuated HCL-Induced Duodenal Hyperemia and Mucus Generation Measured by Endoscopic Reflectance Spectrophotometry: A Prospective, Randomized, Controlled Study.” Co-authors of the paper were James F. Holland, MD, Phoenix; and Felix W. Leung, MD, of the **Sepulveda VAMC**.

### VA Research Currents

*is published monthly for the*

Office of Research and Development  
of the Dept. of Veterans Affairs  
by VAR&D Communications

103 S. Gay St., Rm. 517

Baltimore, MD 21202

(410) 962-1800, ext. 223

[researchinfo@vard.org](mailto:researchinfo@vard.org)

**PROSTHETICS** (cont. from pg. 1)

evidence, that the ultimate prosthesis would directly attach to the residual limb. Researchers at the San Diego VAMC are investigating the use of titanium implants to directly connect a prosthesis with bone, a concept known as osseointegration. Osseointegration was first introduced in Sweden and primarily used for dental implants. This work has extended to digital attachments and, currently, shows limited success with lower limb amputees. Perhaps the greatest advantage for those using osseointegrated prostheses is increased proprioception and, hence, improved gait. It is hoped that secondary complications of residual limb skin breakdown can be avoided and comfort increased as well.

**Complete integration**, however, includes more than just bone. Nerves and skin must also integrate with prosthetic components to create the optimal artificial limb. MicroElectroMechanical Systems (MEMS) may offer a piece of the solution. MEMS technology offers a world where machine gears are no bigger than a grain of pollen and the laws of gravity and inertia give way to atomic forces and surface science. Components such as gyroscopes, accelerometers, actuators, resonators, motors and comb drives can operate and interact as part of a system that fits on a silicon chip. The goal is systems that “think, sense, act and communicate” for the benefit of the user. With MEMS technology, it is possible to imagine a biocompatible system that could become part of a prosthesis and constantly readjust gait patterns of amputees.

**This is not as futuristic as it may sound.** The commercially available C-Leg uses computerized components in an artificial knee to sense angle measurements and movements 50 times per

second, correcting joint position and producing a more natural walking pattern. It offers an improvement, but the technology is not close to enabling an amputee to adjust to real world experiences such as changing terrain or increased load.

**In advancing the field of prosthetics**, VA Rehabilitation Research and Development is not only interested in developing improved “gee whiz” prosthetics, but in validating their efficacy of use. For instance, the above-mentioned C-Leg is currently available, but at an extraordinary cost. Does it provide true functional gain? Can we do better?

To the first question, I would answer, we do not know, but VA is the place to find out. To the second, *of course* we can. And we must. Within the VA is a wealth of knowledge. Our prosthetic services are among the most dedicated in the world. We have built-in capacity in clinical work, engineering, and biosciences. Rehab R&D has already issued a call for proposals to bring these components together. But this is just a beginning. We intend to continue to push an agenda for bringing new science to the old problem of providing the best solutions in artificial limbs. ■

**Pending publication?**

Notification of upcoming publications and presentations can be sent to R&D Communications by e-mail at [researchinfo@vard.org](mailto:researchinfo@vard.org) or by fax at (410) 962-0084. Include the manuscript title, journal title and publication date (if known), abstract, and full names and degrees of all VA-affiliated authors or presenters.

If you feel the publication or presentation is particularly newsworthy, please indicate so.

**Funding opportunities**

Details on all three of the following programs are available from Joe Gough, MA, of the Cooperative Studies Program (CSP) at (202) 273-8248.

• **Tri-National Research**—CSP is seeking letters of intent for phase III clinical trials to be conducted jointly by researchers from VA and the national research agencies of the United Kingdom and Canada, as part of VA’s Tri-National program. Priority areas are behavioral health, prostate disease, pain management, respiratory disease, aging-related diseases, rheumatologic and musculoskeletal disorders, and type 2 diabetes. The deadline is Jan. 11, 2002.

• **Clinical trials in health services**—CSP and HSR&D will be jointly funding clinical trials of new systems or clinical interventions to improve the quality and delivery of care. Priority will be given to trials evaluating interventions to improve care for patients with chronic illness; enhance equal access and utilization of care; educate patients and families; improve patient safety; implement evidence-based practice guidelines; or improve the quality and cost-effectiveness of substance-abuse treatment.

• **Clinical trials in rehabilitation**—CSP and Rehabilitation R&D will fund late phase II and phase III clinical trials of new rehabilitation interventions and models to improve the physical, psychosocial or cognitive functioning of patients with stroke, spinal cord injury, Parkinson’s disease, multiple sclerosis and other conditions. Funding will also be available for studying the effectiveness of CAD/CAM in prosthetics; hearing aid outcomes; and the cost-effectiveness of rehabilitation interventions. ■

## Durham investigator awarded Howley Prize for autoimmunity research

**D**avid Pisetsky, MD, PhD, chief of Rheumatology at the Durham VA Medical Center and a professor of medicine and immunology at Duke University Medical Center, won the 2001 Howley Prize from the Arthritis Foundation for his investigations of the role of bacterial DNA in autoimmune diseases such as systemic lupus erythematosus.

In research over the past two decades, Dr. Pisetsky has shown that bacterial DNA has a powerful capacity to activate the immune system and induce anti-DNA antibodies. His findings have led to a better understanding of lupus, which he calls a “prototypic autoimmune disease” and other infectious and inflammatory diseases in which there is an autoimmune response. His work may also have applications for other health issues relating to immunity: vaccinations, treatment of infectious diseases, and even defense against biological

warfare. “While our investigations started with arthritis and lupus, once we identified bacterial DNA’s immune properties, it became apparent that our work had an even greater relevance in health and disease,” said Dr. Pisetsky.

The researcher credited VA with funding his work for more than 20 years and providing a supportive research environment. “I feel very fortunate to be part of an organization that is committed to medical research and provides an opportunity for physician-scientists like myself to both pursue research and care for patients.”

The award, which comes with a \$20,000 prize, will be presented at the national meeting of the Arthritis Foundation, Nov. 15 – 17 in San Jose.

### Next R&D Hotline Call:

Nov. 19, 12 – 12:50 p.m. (EST).  
Dial (877) 230-4050, code 17323

### MEETING (cont. from pg. 1)

Fiscal Year 2003 Independent Budget proposal of veterans service organizations and research advocacy organizations, which described VA research as “the most focused and clinically productive research program in the federal research portfolio.”

Dr. Feussner noted that VA research will maintain its leadership with new initiatives in areas such as cancer, mental health, stroke and dementia, AIDS, hepatitis, quality of care, rehabilitation outcomes and microtechnology. He added that the program’s challenges will include infrastructure needs, recruitment and retention of researchers, information technology, human and animal protections and risk management.

The conference also included presentations on human and animal research protections, safety of research personnel, budget issues, emerging policy issues, technology transfer, conflicts of interest, and information technology. Slides from most talks are available under “Conferences” on the VA R&D website at [www.va.gov/resdev](http://www.va.gov/resdev). ■

VA Research and Development Communications  
Department of Veterans Affairs  
103 S. Gay St., Rm. 517  
Baltimore, MD 21202