



As part of the workshop's information-sharing session, Rosemarie Cooper (foreground) discussed tilt-in-space, recline, and standing systems. She also reviewed cushions and their appropriate applications.

a BOOST for quality of life

by Christine M. Heiner and Rory A. Cooper, Ph.D.

photos by Nick Lancaster, used with permission from the VA Office of Research and Development

Combine information and a wheelchair-skills demonstration and what do you get? A dynamite workshop showing how assistive technology can make people active again!

The Human Engineering

Research Laboratories (HERL) of the VA Pittsburgh Healthcare System and the University of Pittsburgh began a collaborative relationship with Walter Reed Army Medical Center (WRAMC), Washington, D.C., this year in an effort to promote research, translate research into clinical practice, and provide research education. The ultimate goal of this relationship is to start joint HERL-WRAMC research and development activities that will improve coordination and provide state-of-the-science assistive-technology services between and within the departments of Veterans Affairs (VA) and Defense (DoD).

HERL-WRAMC collaborative efforts were realized on January 14, 2005, when WRAMC, VA Rehabilitation Research & Development Service, Paralyzed Veterans of America (PVA), and the University of Pittsburgh sponsored a "State-of-the-Science Workshop: Wheelchair Research and

Clinical Practice Featuring Wheelchair Skills Training." During the first portion of the day, HERL faculty provided educational presentations on the latest research and clinical practices in rehabilitation. The educational component was followed by a wheelchair-skills demonstration, modeled after the slalom at the National Veterans Wheelchair Games (NVWG).

What Is WRAMC?

WRAMC, the U.S. Army's primary care provider for ill or injured service members who are evacuated for specialty treatment, has sent its own staff into harm's way. More than 250 soldiers from WRAMC have been deployed to Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF), staffing a variety of combat support hospitals in Iraq, Kuwait, and Afghanistan. In order to fill vacancies at WRAMC, over 200 Army Reservists were mobilized into active duty



Workshop presenters included (from left) doctoral candidate Erik Wolf, Dr. Alicia Koontz, Dr. Rory Cooper, Rosemarie Cooper, Dr. Michael Boninger, and Dr. Paul Pasquina.

and assigned to the facility.

Shortly after combat operations began, WRAMC started to care for service personnel returning from the theater of operations. By the end of 2004, the WRAMC medical staff had treated more than 4,100 wounded, ill, or injured soldiers from OIF and OEF including some 1,050 whose wounds or injuries were a result of enemy action.

Nearly half of the wounded are non-commissioned officers. Many of the battlefield casualties are soldiers who have had amputated limbs. There have been about 84 medical evacuations to WRAMC for spinal-cord or -column injuries. The flak vest appears to prevent or reduce a significant number of potential penetrating spinal-cord or -column injuries. A number of soldiers have incurred traumatic brain injuries.

Wounded, ill, or injured soldiers are often transported from the battlefield to Landstuhl Army Medical Center, Germany, where they are triaged [sorted as to medical priority]. As soon as possible, they are sent to WRAMC on state-of-the-art hospital planes, some of which contain intensive-care units. Soldiers can get to WRAMC in as few as 16 hours after being wounded or injured, but the average time is about 9 days. There is a low incidence of deterioration in health condition during evacuation, indicating the system provides satisfactory care.

Army physicians who are nationally recognized for their skill, training, and experience lead Walter Reed's departments and services. Because of the high number of soldiers who needed limbs amputated, Congress appropriated funds for a specialty Amputee Care Program and to construct an Amputee Patient Care Center. The Amputee Care Program is under the medical directorship of LTC Paul F. Pasquina, M.D., who is a physiatrist and chief of the Physical Medicine and Rehabilitation (PM&R) Service.

Dr. Pasquina and his colleagues became the inspiration for characters in the "Doonesbury" cartoon strip after G. B. Trudeau, the strip's creator, visited WRAMC. The perennial character "B.D." was recalled to active duty as a Civil Affairs Officer and went through rehabilitation at WRAMC after losing a leg during combat in Iraq. The exposure of medical rehabilitation in this manner has helped to bring awareness to the American public about what can be accomplished through rehabilitation.

The Amputee Care Program is supported by PM&R, orthopedic surgery, occupational and physical therapy, social work, psychiatry, nursing, prosthetics and orthotics, anesthesiology, and VA counselors. The Amputee Care Program has treated more than 200 service personnel who lost at least one limb during OEF or OIF, representing about 80% of all service members

Alicia M. Koontz, Ph.D., provided strong evidence for the benefits of ultralight wheelchairs, especially for the young injured or wounded veterans returning from Operation Iraqi Freedom and Operation Enduring Freedom.

who have had limbs amputated due to these theaters of operation.

The WRAMC PM&R Service provides care through a multidisciplinary team approach for back and neck injuries, musculoskeletal disorders, stroke, spinal-cord and traumatic brain injuries, chronic pain conditions, limb amputations, and pediatric disabilities. WRAMC cares for service members, retirees, and their dependent families. It offers clinical medicine services, educates and trains future healthcare providers for the military, and conducts research in support of its mission. The VA Rehabilitation Research & Development Service, under the direction of Mindy Aisen, M.D., has worked with the WRAMC PM&R Service to build research and education collaborations to help ensure the highest quality of care is available to wounded, ill, or injured soldiers.

When HERL Met WRAMC

In December 2003, the VA Prosthetics and Special Disabilities Populations Advisory Committee visited Ward 57 at WRAMC. Orthopedics and rehabilitation have responsibility for Ward 57. This was the first time HERL Director Rory A. Cooper, Ph.D., and Dr. Pasquina met. They would not meet again until July 2004, during congressional testimony about the progress of medical rehabilitation of OEF and OIF soldiers and the possible use of research available from the VA Rehabilitation Research & Development Centers. Drs. Cooper and Pasquina talked afterward about working together more closely.

In October 2004, they met again at the White House Conference on Assistive Technology and the New Freedom Initiative sponsored

by VA and the White House Office of Science and Technology. In November 2004, Dr. Cooper presented "Grand Rounds" for WRAMC PM&R. This led to the idea of holding a more comprehensive workshop on wheelchairs and seating, as many of the soldiers being treated by WRAMC-PM&R



Erik Wolf (left) and Jon Pearlman watch Dr. Rory Cooper propel over a thick rope on the slalom obstacle course.

Mobility Aids

The Human Engineering Research Laboratories (HERL) is a collaborative research center of excellence of the Department of Veterans Affairs (VA) and the University of Pittsburgh. Eleven years ago, the Paralyzed Veterans of America (PVA) was the first source of funding for HERL and continues to support the facility today. HERL Director Rory Cooper, Ph.D., is a PVA member.

Over the years, PVA has underwritten research that has paid dividends by helping wheelchair users negotiate daily challenges more successfully. Such practical knowledge has improved the quality of life for people living with paralysis.

The resulting PVA publications cover a wide variety of topics, from healthcare for people with SCI and MS to consumer guides on SCI to government and the law to living with SCI. These resources include *A Guide to Wheelchair*

Selection: How to Use the ANSI/RESNA Wheelchair Standards to Buy a Wheelchair (\$19.95 plus shipping and handling charge; order from PVA Distribution Center, [888] 860-7244) and *Wheelchairs: Your Options & Rights—Guide to Obtaining Wheelchairs from the Department of Veterans Affairs* (free; shipping and handling charge; available from PVA Office Services, [202] 872-1300).

The Manual Wheelchair Training Guide offers a full range of manual-wheelchair skills with clear instructions accompanied by illustrations. Its counterpart is *The Powered Wheelchair Training Guide*. These resources are \$20 each, plus S&H, and are available from Pax Press, (775) 783-8822 / paxpress@beneficialdesigns.com.

For an overview of other helpful publications from PVA, visit www.pva.org.

receive wheelchairs. In December 2004, Drs. Cooper and Pasquina met and communicated frequently to plan the workshop.

"State-of-the-Science Workshop: Wheelchair Research and Clinical Practice Featuring Wheelchair Skills Training" took place on January 14, 2005, at WRAMC. Clinicians throughout DoD and VA were invited to participate, as were patients, families, and people from other federal agencies. About 120 individuals attended the conference, despite persistent rain and cold temperatures.

The session was simultaneously broadcast through the WRAMC education services; medical centers in Texas, Georgia, and New York participated remotely. Many WRAMC rehabilitation clinicians attended, as did their colleagues from the Bethesda Naval Medical Center. Other participants were from VA, National Institutes of Health (NIH), Agency for Healthcare Research and Quality, and the National Institute for Disability and Rehabilitation Research (NIDRR). Dr. Margaret Giannini from the Office of Disability, Department



About 120 people attended this special wheelchair workshop. The sessions were videotaped and will be available to VA and Department of Defense facilities.

of Health and Human Services, also was present.

The entire workshop was videotaped and will be available to VA and DoD facilities for educational purposes. The presentations are posted on HERL's Web site (www.herlpitt.org).

Sharing Information

The workshop was kicked off by a welcome by Dr. Pasquina, who gave an overview of the services provided by PM&R and affiliated services at WRAMC. He described the number of soldiers from OIF and OEF being served and the need to continue education and further collaboration between organizations like VA and PVA.

HERL Medical Director Michael L. Boninger, M.D., talked about training physiatrists and other rehabilitation professionals in research and assistive-technology service delivery. He offered an excellent overview of how research and education are critical to providing high-quality clinical care.

Alicia M. Koontz, Ph.D., RET, a HERL research scientist, covered manual-wheelchair selection and fitting as well as transfers. She tied together research with practical guidance. She provided strong evidence for the benefits of ultra-light wheelchairs, especially for the young injured or wounded veterans returning from OIF and OEF. Most of the soldiers with lower-limb amputations optimize their mobility through use of wheelchairs and prosthetic limbs.

HERL Clinical Coordinator Rosemarie Cooper, M.P.T., A.T.P., spoke on pressure management and seating systems. She gave a comprehensive review of cushions, their assessment, and appropriate applications. She also discussed the use of tilt-in-space, recline, and standing systems.

Erik J. Wolf, M.S., a HERL Ph.D. candidate, was the final speaker in Joel Auditorium. He addressed power-wheelchair research and clinical practice. He showed a variety of power-chair technologies, from simple devices to complex robotic systems with navigation assistance.

The session adjourned for lunch, which PVA provided. Dr. Cooper and PVA Research, Education, and Practice Guidelines Director Tom Stripling presented complete sets of the Spinal Cord Injury Consortium Clinical Practice Guidelines to the WRAMC and Bethesda Naval Medical Center PM&R residency programs. Dr.



The wheelchair-skills demonstration included navigating a doorway.

Cooper provided an overview of the VA Rehabilitation Research and Development Centers. He showed the depth and breadth of medical-rehabilitation research being conducted within VA and described possible avenues for collaboration. A brief discussion led by Dr. Pasquina ensued prior to moving on to the wheelchair-skills training and demonstration.

Wheelies...and More!

HERL constructed and transported several obstacles for the wheelchair-skills demo. These included stairs, a horizontal ladder, ramps, platforms, doorway, a large hemp rope, and a piece of plywood with obstacles screwed to it. The course was set up in WRAMC's physical-therapy gym.

Rosemarie Cooper explained each of the obstacles and the importance of training mobility skills. Dr. Rory Cooper went through the course

Some of the patients and clinicians attempted the slalom course, achieving a greater appreciation for what can be done in a wheelchair and the importance of proper selection and fitting.



Dr. Rory Cooper (right) presents to Dr. Paul Pasquina a plaque commemorating the new collaborative relationship between HERL and Walter Reed Army Medical Center.

and described how to maneuver through each obstacle. He was then timed while racing through the course. The wounded soldiers were impressed and motivated to overcome these obstacles to daily living.

The need to teach and learn "wheelie" skills was emphasized when working with the young

athletic patients often seen at WRAMC and other DoD medical facilities. The course was modified, and it was demonstrated that many obstacles can be overcome by using a power wheelchair. After the wheelchair-skills demonstrations, people (including OIF/OEF patients) were divided into pairs to teach each other manual and powered-mobility skills. After gaining greater experience, some of the patients and clinicians attempted the slalom course, achieving a greater appreciation for what can be done in a wheelchair and the importance of proper selection and fitting.

Shirts depicting the "Bradley Fighting Vehicles," and hats, provided by United Defense and PVA, were distributed to the 15–20 wounded soldiers who participated and to volunteers who assisted with the workshop.

At the end of the day, clinicians and the wounded soldiers went away smiling and talking about the experience. LTC Barbara Springer, chief of the Physical Therapy Service at WRAMC, invited HERL to return and provide another session on practical wheelchair-skills training. Everyone from HERL was excited about this opportunity.

Currently, plans for another HERL/WRAMC "State-of-the-Science Workshop" are underway, this time focusing on traumatic brain injury (TBI). It is tentatively planned for April 22 at Walter Reed Army Medical Center.

Contact: heinerbcm@pitt.edu. ■