

GUEST EDITORIAL

Rory Cooper receives VA's prestigious Olin E. Teague Award

More than two decades have passed since Rory A. Cooper, PhD, director of the Center for Wheelchair and Related Technology and Department of Veterans Affairs (VA) senior career research scientist, was hit by a truck while cycling in Germany. The accident left him paralyzed and dependent upon a clunky 80-pound wheelchair for mobility. Not accepting the physical limitations of his wheelchair, Cooper set out to realize a childhood dream of becoming an engineer and to design a lighter, more agile wheelchair that empowered him and other users to enjoy life fully, whether at work or play.

Cooper accomplished those goals and has become one of the foremost authorities on wheelchair design. His unparalleled contribution to rehabilitation research and its impact on veterans with disabilities have earned him the prestigious Olin E. Teague Award from the VA. Cooper, also professor and chair of the Department of Rehabilitation Science and Technology at the School of Health and Rehabilitation Sciences, University of Pittsburgh, was honored at a special ceremony held in Washington, DC, on September 18, 2002. He is the twenty-second individual to earn this distinction.

"I was deeply honored and grateful to the colleagues, friends, and fellow veterans who supported my nomination," Cooper stated on receiving the award. "I am motivated by the goal to enhance community integration of people with disabilities and to continuously improve rehabilitation services."

Since 1979, VA has granted the Olin E. Teague Award to a VA employee or a team of employees whose achievements have been extraordinarily beneficial to the rehabilitation and improvement of quality of life of war-injured veterans. The award honors the late Olin E. Teague, U.S. Representative from Texas and advocate of veterans with disabilities, who served on the House Committee on Veterans Affairs for 32 years, 18 of those years as chairman.

The award recognizes Cooper's pioneering efforts in the treatment and rehabilitation of individuals with paralysis. These efforts include designing modern manual and electric-powered wheelchairs, developing and implementing wheelchair standards, promoting the understanding of secondary disabili-



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ties among wheelchair users, increasing the availability of high-quality products and services for veterans who use wheelchairs, and improving community integration.

A native of California, Cooper returned home following his accident and enrolled in California Polytechnic State University (CPSU), earning both his undergraduate and graduate degrees in electrical engineering. While a student at CPSU, he became interested in wheelchair racing and developed a practical arm-cycle that allowed people to participate in cycling alongside their family and friends. Further honing the design, he built the first

racing wheelchair that shared no parts with a standard manual wheelchair.

Serving in the role of engineer was not enough for Cooper. He also became an advocate for individuals with disabilities and worked to promote the integration of people with disabilities into community events such as fun runs, road races, and triathlons. Leading by example, he was among the first to participate in triathlons alongside individuals without impairments. Cooper's expertise in wheelchair design and his desire to empower other people with disabilities to engage in recreational activities have made it possible for many more to participate in activities such as wheelchair racing and cycling.

As an electrical and computer engineering doctoral student, at the University of California, Santa Barbara, Cooper studied the ergonomics of wheelchair propulsion and its relationship to increased mobility and decreased risk of developing secondary disabilities. This research added to the understanding of wheelchair propulsion biomechanics and to the development of the SMART^{Wheel} through VA merit review funding. Today, the SMART^{Wheel} is used in laboratories throughout the world to assess wheelchair mobility skills, to study wheelchair propulsion biomechanics, to develop accessible surfaces, and to characterize mobility barriers in the community.

After earning his doctorate degree, Cooper pursued postdoctoral studies at the Hines VA Hospital and joined the faculty of the Department of Biomedical Engineering, California State University, Sacramento (CSUS). During his four-year tenure at CSUS, he established the Rehabilitation Engineering Program and supervised nearly two-dozen graduate student theses. Under the tutelage of Cooper, one graduate student designed the Varilite Cushion, a popular cushion used by people with disabilities. Thanks to Cooper, many of his former students serve in VA clinics or research laboratories.

In 1994, Cooper came to the VA Pittsburgh Healthcare System where he focused on repetitive strain-injury (RSI) among manual wheelchair users. Driven by the knowledge that from 50 to 80 percent of long-term users of manual wheelchair develop an RSI to their arms, Cooper developed a measurement device to estimate the stresses on the arm joints during wheelchair propulsion. He helped design and conduct clinical trials, that demon-

strated ultralight wheelchairs lowered the risk of RSI. Based in part upon this research, the VA now provides an ultralight model to long-term users of manual wheelchairs.

While Cooper's work is reflected in nearly every manual wheelchair marketed today, his most recent research focuses on the design of electric-powered wheelchairs. Johnson & Johnson approached Cooper to evaluate a novel concept to provide users of electric-powered wheelchairs the ability to climb stairs, negotiate curbs, traverse soft terrain, and reach high objects. To extend the SMART^{Wheel} concept, Yamaha Motor Corporation produced a new class of wheelchair called the Pushrim-Activated Power-Assisted Wheelchair (PAPAW). PAPAWs operate similarly to a manual wheelchair, but the user receives assistance from a small electric motor. Three companies manufacture PAPAWs.

Cooper has not only streamlined the design of wheelchairs, he has also influenced international wheelchair standards, as well as advocated for increased access to high-quality assistive technology. Responding to veterans concern about the quality and durability of wheelchairs, Cooper joined an effort to develop the International Organization for Standardization (ISO) for wheelchair standards. He also developed a complete test laboratory and worked with industry leaders to improve the quality of their wheelchairs. Not satisfied, he conducted the first comparative studies of wheelchairs using ISO standards. Data from these studies indicated that high-quality wheelchairs, though more expensive to manufacture, were significantly more durable. An ISO member for more than a decade, he has been instrumental in writing nearly every wheelchair standard in the world. The VA and Food and Drug Administration (FDA) rely upon wheelchair standards for evaluation of safety and efficacy. Millions of people have benefited from this work.

Many veterans who use wheelchairs are also Medicare beneficiaries. Cooper helped to persuade Medicare officials to change its policy on the prescription of ultralight wheelchairs. For the first time in 2001, Medicare beneficiaries had preapproval funding for ultralight wheelchairs. He helped create VA guidelines for the prescription of wheelchairs and eligibility requirements for electric-powered wheelchairs, to include veterans who do not have

the ability to propel a manual wheelchair because of pain, low cardiovascular capacity, or upper-limb injury.

Through his research and advocacy, Cooper has garnered the attention of the international rehabilitation community. Author or coauthor of more than 300 papers, expanded abstracts, and book chapters, Cooper is a highly respected scholar in the field of mobility research. An elected fellow of the Institute of Electrical and Electronics Engineers (IEEE), Rehabilitation Engineering and Assistive Technology Society of North America (RESNA), and of the American Institute of Medical and Biological Engineering (AIMBE), he has been an invited lecturer at institutions around the world and was awarded “Honorary Professor” at Hong Kong Polytechnic University.

Cooper serves on numerous committees, including the executive committee of RESNA, RESNA/ANSI (American National Standards Institute) and ISO wheelchair standards, board of directors of the American Society for Neurorehabilitation, Centers for Medicare and Medicaid Services—Medicare Advisory, VA Prosthetics and Special Disability Programs Advisory, and National Institutes of Health (NIH) National Center for Medical Rehabilitation Research Advisory. He is a trustee of the Paralyzed Veterans of America Spinal Cord Research

Foundation and served on the steering committee for the 1996 Paralympic Scientific Congress.

Among his professional awards are IEEE-EMBS (Engineering in Medicine and Biology Society) Early Career Award, Paralyzed Veterans of America John Farkas Leadership Award, the CalPoly 1999 Honored Alumnus for the College of Engineering, Dion-Johnson Award for Spinal Cord Research, IEEE-USA Professional Service Award, and the British Ex-Services Wheelchair Sports Association Endeavor Award.

A unique combination of scientist, advocate, and veteran with disabilities, Cooper is a testament to the resiliency of the human spirit and the power of one individual to change the world. He does not dispassionately review research statistics that are his life’s work but sees humanity in the statistics. “It only takes a few moments for me to see people with disabilities going through rehabilitation or participating in an advocacy meeting or competing in a sports event to become energized,” commented Cooper on the inspiration of his research. “People with disabilities are a great source of information, knowledge, and motivation for research.”

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