



COURTESY OF VA OFFICE OF RESEARCH AND DEVELOPMENT

Frederick Downs Jr., director of VA's Prosthetic and Sensory Aids Service, tries the prosthetic arm developed by DEKA at the company's headquarters in New Hampshire.

VA Conducting Three-Year 'Optimization' Study of Advanced Prosthetic Arm

VA has launched a three-year study of an advanced artificial arm that easily allows those with severe limb loss to pick up a key or hold a pencil.

"This arm is a high-tech example of how VA researchers are continually modernizing the materials, design, and

clinical use of artificial limbs to meet veterans' lifestyle and medical needs," said Dr. Joel Kupersmith, VA's chief research and development officer.

In collaboration with the Defense Advanced Research Projects Agency, or DARPA, the study marks the first large-scale testing of the arm, which allows those who have lost a limb up to their shoulder joint to perform movements while reaching over their head, a previously impossible maneuver for people with a prosthetic arm.

The study is under the direction of Dr. Linda Resnik at the VA medical center in Providence, R.I. Veterans fitted with the arm will provide feedback to guide engineers in refining the prototype before it is commercialized and also made available through the VA health care system.

A unique feature of the advanced arm is its control system, which works almost like a foot-operated joystick. An array of sensors embedded in a shoe allows users to maneuver the arm by putting pressure on different parts of the foot. The current version uses wires to relay the signals to the arm, but future versions will be wireless.

The arm can also be adapted to work with other control systems, including myoelectric switches, which are wired to residual nerves and muscles in the upper body and respond to movement impulses from the brain, shoulder joysticks or other conventional inputs.

Frederick Downs Jr., director of VA's Prosthetic and Sensory Aids Service, who lost his left arm during combat in Vietnam, said he was "brought to tears" recently when the prosthetic arm allowed him to smoothly bring a water bottle to his mouth and drink. "Learning to use the controls is not difficult," he said, due in part to a sensor in the artificial hand that sends a vibration signal that tells how strong the grip is. A stronger grip causes more vibration.

VA prosthetics research also includes vision and hearing aids, wheelchairs and propulsion aids, devices to help people with brain injuries to become mobile, and adaptive equipment for automobiles and homes—"everything that's necessary to help veterans regain their mobility and independence," said Downs.

VA, DoD Researchers Collaborate on Study of Long-Term Outcomes for Veterans With Burn Injuries

A new study by researchers with VA and the Department of Defense is looking at long-term outcomes for veterans of the wars in Iraq and Afghanistan who have suffered serious burn injuries. What are their health care and social service needs months and years after their injuries? How well can they

function? There has been little research to date on the topic.

"Until a decade or two ago, there was a much greater mortality rate for people with serious burns," says study co-leader Polly Hitchcock Noel, Ph.D., of the Veterans Evidence-Based Research Dissemination and Implementation Center (VERDICT), based at

the San Antonio VA Medical Center. "With improvements in acute care, people are now surviving more severe burns. Now there is more of a population in which to study longer-term outcomes."

Lead investigator Valerie Ann Lawrence, M.D., also of VERDICT, adds: "Along with rapid evacuation for military

wounded, we are much better at acute resuscitation and innovations such as topical antimicrobials to prevent infection, and artificial skin options. Surgeons are more aggressive about removing tissue they feel won't survive and moving on to grafts earlier." She also cites the development of comprehensive,