Department of Veterans Affairs

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Fact Sheet

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VA's Prosthetics and Sensory Aids

One of the four strategic goals of the Department of Veterans Affairs is to restore the capabilities of disabled veterans to the greatest extent possible, and VA has become a world leader in prosthetics and rehabilitation.

VA has an integrated delivery system designed to provide medically prescribed prosthetic and sensory aids, devices, assistive aids, repairs and services to disabled individuals to facilitate treatment of their medical conditions.

The number of veterans seeking these services from VA exceeded 1.3 million veterans in FY 2007. As the demand has increased, so has the budget for VA's Prosthetics and Sensory Aids Service (PSAS): from $532 million in 2000 to $1.12 billion in 2006. VA's PSAS budget for FY 2007 was $1.24 billion and would increase to $1.39 billion under the FY 2008 budget proposed to Congress by President Bush.

VA currently has 58 orthotic-prosthetic labs staffed by 185 employees called prosthetists and orthotists. The majority of these specialists are certified by the American Board for Certification in Orthotics and Prosthetics or the Board of Orthotist and Prosthetist Certification. They provide devices prescribed by examining physicians, and consult in clinics, custom fabricate, fit and repair artificial limbs and braces or order them from commercial vendors.

The labs and their staffs have been increasing their certification levels. As of August 2007, 58 of the VA prosthetic and orthotic labs have earned certification by one of the two national accrediting organizations and 131 prosthetists and orthotists were board-certified. Additionally, eight of these accredited labs have also earned certification from the National Commission on Orthotic and Prosthetic Education, which enables these labs to participate in residency programs from the nine prosthetic and orthotic programs in universities and colleges in the United States.

VA specialists in prosthetics and orthotics evaluate a veteran's lifestyle and medical condition to determine and recommend which type of prosthetic limb or brace to provide. An orthotist designs and fabricates custom braces, and fits these to a patient's extremities or spine.

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A prosthetist designs custom prostheses and fabricates custom sockets, orders components, assembles the prosthesis and fits it to the veteran's residual limb.

The prosthetist and orthotist fabricate, repair and adjust appliances in a laboratory that is equipped with specialized machines and CAD/CAM equipment. Prosthetists and medical specialists in various disciplines form amputee clinic teams who see the veteran regularly after fitting to ensure the artificial limb functions well.

Technologies for Future Advances

These VA specialists have access to the latest technologies, such as microprocessor knees. In FY 2006, they provided 149 veterans with a "C-Leg," a computerized leg that allows people who have had amputations above the knee to approximate a normal gait. The total cost was $5.3 million.

The C-Leg uses a computer-controlled hydraulic system regulated by internal feedback. Sensors in the pylon (shank section) of the artificial limb send information such as toe load, knee angle and other information to an onboard microprocessor. This information is then interpreted by the microprocessor to adjust to the patient's need.

In the past, most VA prosthetic patients lost limbs in combat. Today's typical patient is a middle-aged male who suffered an amputation due to vascular disease, but in the future VA expects to provide prosthetics to many veterans of the wars in Iraq and Afghanistan who have lost limbs in the war.

The trend in prosthetics is to integrate body, mind and machine. VA's Center for Restorative and Regenerative Medicine at the VA medical center and Brown University in Providence, R.I., are at the leading edge of a movement to create artificial limbs that function almost like natural ones.

Among works in progress:

* A knee-ankle prosthesis with sensors that measure force, position and movement to feed to an embedded microprocessor. The knee and ankle use electromagnets, friction-modulating fluid and polymers to turn electrical energy into mechanical force, thus creating a kind of artificial muscle enabling amputees to walk greater distances.

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* Microchips that are bionic neurons – or "bions" – will be injected into residual leg or arm muscles to pick up movement signals from the brain and send them to the new limb. Bion technology will provide not only output commands, telling the artificial limb what to do, but sensory feedback, so the prosthesis reports back to the brain what it did without needing to be seen.

* Besides robotics and engineering, new medical techniques are being tested. These include surgery to lengthen bone in the residual limb, making it easier to fit the artificial limb and allowing more mobility, and attachment of an artificial leg to a titanium bolt placed in bone to avoid problems of current anchoring methods.

Some assistive devices are not replacements for parts of the body but are adaptations of mainstream technology to compensate for lost physical functioning. At Walter Reed Army Medical Center in Washington, D.C., VA's vocational rehabilitation and employment program has provided voice-recognition computers so Iraq war soldiers who have lost a hand can learn computer skills even without having full typing capability.

Making sure that new devices and technology work in the real world and are prescribed at VA amputee clinics is the ultimate challenge. In addition to the C-Leg, there are now numerous other prosthetic components that use microprocessor technology, such as the RHEO knee, adaptive knee, self-learning knee and power knee. The iBOT wheelchair was tested in 2003-04 before VA authorized prescribing it.

Finally, no less important than new prosthetic component technology is the overall care an amputee must receive during rehabilitation. The model for that care has changed over the years to improve services to VA patients. The goal is not only to teach amputees to walk or use an artificial arm and hand. Continuing care and long-term support from VA multi-disciplinary teams have shown that patients often can improve their functioning months or years after their injuries or amputation.

Other products and services disabled veterans receive included: wheelchairs and scooters, braces, shoes and orthotics, oxygen and respiratory equipment, other medical equipment and supplies (beds, lifts, computer equipment, telehealth products) and surgical implants (pacemakers, cardiac defibrillators, stents, dental devices). In fact, VA provides items ranging from simple $2 foam shoe inserts to stair-climbing $30,000 iBOT wheelchairs to allow disabled veterans to live independently. VA also provides home improvements and structural changes, and adaptive equipment for automobiles, to veterans with service-connected disabilities.

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