

GUEST EDITORIAL

Eugene F. Murphy, PhD, and early VA research in prosthetics and sensory aids

Marguerite Hays, MD

Eugene F. Murphy, PhD, who joined the VA prosthetics program as its Assistant Director for research in 1948, died on December 20, 2000. In addition to being a remarkable human being—an example to all of what a physically disabled person can accomplish (he had polio as a child and walked with the aid of orthoses and canes)—he was a storehouse of knowledge about the VA's early Prosthetics Research program. In 1992, I was fortunate to spend a long evening with him, interviewing him about his recollections. By then his paralysis confined him to a wheelchair, but his spirit was unchanged. Nine years after he retired from the VA, he was still full of new ideas and enthusiasms.

Murphy, a Cornell mechanical engineer (ME '35), received his MME at Syracuse ('37), and the PhD ('48) from the Illinois Institute of Technology (IIT). After several jobs in industry, he taught at IIT ('39-'41) and at the University of California Berkeley (UCB), ('41-'48). He became interested in prosthetics while teaching with Howard Eberhart, an acclaimed mechanical engineering professor at UCB, who had lost a leg in a WWII research accident and whose orthopaedic surgeon was Dr. Verne Inman. Consequently, he was closely connected with Dr. Inman's landmark studies of human gait that began in 1945. He was also familiar with the early prosthetics studies at Northwestern University by Paul Klopsteg (also 1945), because of Northwestern's proximity to IIT. It was natural then for Murphy to join the VA in 1948 as Assistant Director for Research in the Prosthetics and Sensory Aids Service, after the Congress passed Public Law 729, 80th Congress, June 19, 1948 (PL 729). He was Director of the Research Center for Prosthetics from 1953 to 1973. The VA program was a contractual program until 1973, and Murphy oversaw the contracts. He was a great expeditor, visiting projects, sharing ideas, fostering collaborations. From 1973-1983 he was Director of Technology Transfer. In 1968, he started the *Bulletin of Prosthetics Research* (later the

Journal of Rehabilitation Research and Development), and remained its editor until he retired in 1983.

Dr. Murphy was a member of the National Academy of Engineering and received many awards, including the Silver Medal from the City of Paris, the Meritorious Service Award of the VA in 1971, and the VA Distinguished Career Award in 1983. He was a Fellow of the ASME, the Acoustic Society (Am), the Optical Society (Am), the American Society of Testing and Materials, and the Rehabilitation Engineering Society of North America, and was holder of a Fulbright lectureship in Denmark ('57-'58).

The 1948 PL 729 formally authorized a program of VA research in the fields of prosthetics and sensory devices, with a budget of \$1,000,000 per year. It included a mandate to the VA "to make available the results of such research so as to benefit all disabled people." Even before this law formally authorized the VA's program, research was already under way. But now there was a line item in the VA budget to support it.¹⁵ Thus, prosthetics research became a legal VA entity ten years before the medical research program was written into law in 1958.¹⁶

Until its own Rehabilitation Research and Development Merit Review Board was set up in the mid 1970s, the VA depended on committees of the National Research Council (NRC) of the National Academy of Sciences to review requests for support of rehabilitation research. Before 1947, the NRC had made direct contracts, on behalf of both the VA and the Armed Forces, on advice of its Committee on Artificial Limbs and its Committee on Sensory Devices. In 1947, the VA took over the funding of these contracts, but continued the advisory role of the NRC committees.¹⁸

Early research under this program included a contract with Northrup Aircraft, Inc., which worked with UCLA scientists, to study the normal arm motion of upper limb amputees. They developed the basic requirements for an arm

prosthesis and went on to develop a new prosthesis with a shrug-operated elbow and improved hook control. An electrically powered artificial arm also was developed at UCLA, as well as a clinic for evaluating new prostheses and a manual for upper extremity prostheses. IBM and its subcontractor Alderson Research Laboratories in New York City developed another type of electric arm. With regard to leg prostheses, scientists at the University of California at Berkeley did basic research on locomotion, especially on gait. The Mauch Laboratories in Dayton, OH, collaborating with Wright Patterson Air Force Base personnel, studied stance control and swing resistance for artificial legs, resulting in the unique S-N-S prosthetic knee. At New York University, a Prosthetic Devices Study was set up to evaluate artificial limbs impartially. An investigator at Columbia University studied kidney function in amputees. At the Mellon Institute of Industrial Research in Pittsburgh, researchers developed improved knee braces. A group at the Massachusetts General Hospital studied low back support and developed new braces to support injured backs. In the sensory aids field, scientists at Haverford College evaluated and modified a device to detect obstacles for the blind.

In 1956, the VA began to support a prosthetics research laboratory at Northwestern University under the leadership of Dr. Clinton L. Compere. This was housed within the Rehabilitation Institute of Chicago, founded by Paul B. Magnuson, MD, after he left the VA. The VA's long-term support of "cutting edge" rehabilitation research work connected with the Rehabilitation Institute continues to this day.

Another important laboratory that is still active is the Prosthetics Research Study in Seattle, set up under Dr. Ernest Burgess in 1964. This laboratory has made important advances in amputation techniques and amputee management, as well as design of artificial feet and the introduction of CAD/CAM methods to prosthetics and the VA through Automatic Fabrication of Mobility Aids (AFMA).

Beginning in 1957, the VA supported work by Mauch Laboratories in Dayton, OH, to devel-

op reading machines for the blind. Some 15 designs were built, and the most promising were used in the VA's Blind Rehabilitation Centers. Other reading machine research was supported at Haskins Laboratories, New Haven, CT, and at the Hadley School for the Blind in Winnetka, IL. Beginning in 1967, the VA supported hearing aid research at the University of Maryland.

Dr. Murphy played a key role in setting up these programs and in nourishing their progress. He served as mentor to many of the young people who have since become key figures in rehabilitation research and development, and he took great pride in their accomplishments.

In 1973, with reorganization of the VA, Rehabilitation Research and Development became organizationally a part of the new Research and Development Office. Soon the rehabilitation research budget, which had grown only modestly since 1948, expanded, as did the types of research supported and encouraged. The intramural research program grew in importance. Even with all this change, the tradition from the 1940s of excellence and of service to the disabled continues in the present program.

America's disabled veterans, and all disabled people, owe a debt of gratitude to Eugene Murphy.

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Marguerite Hays, MD

Dr. Hays has had a long and distinguished career in the VHA, both in headquarters and in the field. It was during her tenure as Chief Research and Development Officer, VHA Headquarters, Washington, DC, that she met and came to know Dr. Murphy. Dr. Hays is now retired; however, she is on contract with VAHQ to work on the history of the VA research program and is a consultant in Nuclear Medicine at the VA Palo Alto Medical Center, Palo Alto, CA.

—Editor