Journal of Rehabilitation Research and Development
Vol. 39, No. 3 (Supplement), May/June 2002
VA/NIH Prosthetics Roundtable
Pages 17–18

Presentation Highlights: International service delivery

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BIOGRAPHICAL INFORMATION

Dr. Mark Pitkin is Associate Professor of Rehabilitation Medicine at Tufts University, School of Medicine, Boston, MA. He is Founder and Director of the International Institute for Prosthetic Rehabilitation of Landmine Survivors (IPRLS) and the Center for Human Performance at New England Sinai Hospital and Rehabilitation Center, Stoughton, MA. He graduated summa cum laude from St. Petersburg University, Russia, in applied mechanics and obtained his PhD in Prosthetics Engineering at the Central Institute for Prosthetics Research in Moscow. Dr. Pitkin was an invited visiting scientist to the Human Performance Laboratory, Calgary University, Canada, in 1989, and to Massachusetts Institute of Technology, Cambridge, MA, from 1991–93. In addition to several Grants from the National Institutes of Health, Dr. Pitkin is also a recent recipient of a grant from the Civilian Research and Development Foundation (CRDF), for conducting the first U.S.-Russian study in prosthetics under a program he initiated.

Since 1998, Dr. Pitkin has run the U.S.-Russian Partnership Program in Prosthetics and Rehabilitation between the IPRLS and the St. Petersburg Albrecht Center for Occupational Expertise, Prosthetics and Rehabilitation. One of the projects of this program was the initiation in 1999 of ice hockey as a sport for leg amputees playing in vertical position. Dr. Pitkin is the Cofounder and former board member and Vice President of the American Amputee Hockey Association.

He is credited with the invention and development of the Free Flow Foot (developed and manufactured by the Ohio Willow Wood Co.), also known as the Rolling Joint Foot/Ankle and the Rolling Joint Knee. He is presently continuing research in the Rolling Joint prosthetic technology he has introduced.

PRESENTATION

The U.S.-Russian Prosthetic Rehabilitation Bridge is a unique, binational collaboration that is advancing prosthetics research and care while providing much-needed help to land mine victims, especially children. This collaboration is between Tufts' International Institute for Prosthetic Rehabilitation of Land Mine Survivors and Russia's St. Petersburg Albrecht Institute of Prosthetics.

While the program eventually aims to treat patients worldwide, its immediate focus is helping Russian land mine survivors who are amputees but whose stumps require medical attention before they can be fitted with prostheses. The stump may have unhealed wounds, inflammation, ulcers, painful scars, bone fragmentation, or other complications that can interfere with the interface of the stump with the prosthesis socket.

Unless these problems are medically resolved, an amputee will not be considered a candidate for prosthetic rehabilitation. Such problems occur primarily because land mine explosions cause a deep propagation of destructive shock waves into the skeletal structures and soft tissues. Aggravating this is the fact that medical attention is often delayed. Even when care is provided, amputation technique and wound treatment for these patients may tend to focus on saving lives, rather than future prosthetic management.

Even once the patient is stabilized, resolving these issues is not a simple matter. In many developing nations, doctors often lack expertise in the type of reconstructive surgery that is required to prepare the stump for a prosthesis. The problem is compounded by a lack of resources, such as advanced prosthetic components. The result is approximately 150,000 land mine victims

around the globe who could use prostheses but are not getting them.

To address this problem, the U.S.-Russian Rehabilitation Bridge provides medical and prosthetic rehabilitation in amputee clinics, along with training and education for physicians, nurses, prosthetists, and rehabilitation therapists. The program includes antishock therapy, stump and pain management, physical therapy, biomechanical services, and social and economic rehabilitation. It combines the best of American engineering achievements in medical and prosthetic rehabilitation with the best of Russian medical expertise.

The program began operating in 1998, on a limited budget, with a focus on children amputees needing reconstructive surgery. Work began with children land mine survivors because of their large numbers in Russia. One in three Russian civilians injured by land mines is a child, of whom only 38 percent will survive the incident. Less developed countries may have a lower survival rate, depending on access to primary care. Of these child land mine survivors, more than 70 percent require reconstructive surgery to use a prosthesis.

Patients who have already been treated by the program include:

- two young brothers who were maimed after bringing a land mine into their kitchen to disassemble;
- an eight-year-old girl who lost a leg in a terrorist bomb attack; and
- a boy, tested before and after reconstructive surgery, for whom biomechanical recommendations for a prosthesis fitting were developed.

Since 1998, 15 adults and 9 children have been treated in the program; many of them have been fitted with Free Flow feet. Free Flow feet enable a reduction in the pressure on the residual limb, as well as more even distribution of pressure and force under both feet. They do this by providing for a more anatomical moment of resistance, regarding leg movement.

An exciting pastime emerging for several of the patients in the program is amputee hockey. Socioeconomic reintegration via this program was a natural expansion. With a sufficient number of patients becoming active wearers of Free Flow feet, playing hockey became possible. Initially, five Russian land mine survivors were brought to Boston, and they inspired American amputees. In 2000, the Rehabilitation Bridge program arranged and funded a trip of American amputees to Russia to play hockey with their Russian counterparts and friends and to visit children in Russian amputee clinics. The American Amputee Hockey Association was founded soon after.

KEY POINTS

- There is an urgent need to help land mine survivors, especially children, with prosthetic rehabilitation. (The World Health Organizations estimates the number of land mine victims awaiting treatment at 250,000.)
- Because of the nature of land mine injuries, survivors often need reconstructive surgery before they can be fitted with a prosthesis.
- In many underdeveloped nations, there is a critical shortage of expertise and resources to rehabilitate land mine survivors. Programs such as the U.S.-Russian Rehabilitation Bridge can provide training, education, and rehabilitation care to address this problem.

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Web Sites

http://www.iprls.org.

[Tufts International Institute for Prosthetic Rehabilitation of Landmine Survivors]

http://www.hop.spb.ru/index_e.html.

[Amputee Ice Hockey project]