Capabilities

Communicating the Science of Prosthetics and Orthotics

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A comparison of prosthetic/orthotic practices in the US and Switzerland

By Margrit Meier, PhD

Above, Dr. Meier applies her practical knowledge in a Northwestern prosthetics laboratory. Dr. Meier, a native of Switzerland, earned her MSc in prosthetics and orthotics from the University of Strathclyde,Glasgow, Scotland.and her PhD in Clinical Sciences from the University of Sherbrooke in Canada.

On February the 7th I joined the team of the Northwestern University Prosthetics Research Laboratory (NUPRL) and Rehabilitation Engineering Research Program (RERP) as a post-doctoral fellow. The warm welcome I received was overwhelming and the research laboratory's friendly and open atmosphere was and is still greatly appreciated!

In general, the most obvious differences between the Swiss and the American orthotic and prosthetic practice lie in the fabrication techniques. My comparisons are based on a relatively short period of time in this country. I am also aware that the orthoses and prostheses seen so far may represent only a small part of the U.S. practices. Furthermore, they will possibly vary between different orthotic and prosthetic facilities, as this is the case in Switzerland, my home country. Despite these restraints I will describe differences observed so far and try to compare the chosen approaches of these two countries in the prosthetic and orthotic domain.

Orthoses and Orthotic Methods

One of the most common orthoses for adults in the U.S.A. seems to be the ankle-foot orthoses (AFO). AFOs are orthoses that enclose the foot and shank in order to restore function and to provide guidance for the lower part of the lower limbs. In America, they seem to be used to a much greater extent than at my former place of employment. And, they are entirely made out of plastic! If an ankle joint is provided, this too is made out of plastic and directly incorporated into the orthosis. However, the plastic material has to have a certain wall thickness in order to provide sufficient strength. Thus, together with the incorporated ankle joint, the orthosis becomes rather large around the ankle joint, a fact that seems to disturb neither the wearer nor the orthotist in America.

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In contrast with these AFOs stands our Swiss versions for adults: In most of the cases we have to provide an orthosis, which is slim, 'good looking', light **and** functional, so that it can be worn in the patients' shoe without any additional changes. Because dress-type shoes are common in Switzerland, the thickness of an orthosis is limited as such a shoe is not as forgiving and flexible as a sport shoe. In Switzerland the best accepted orthoses are those that are not popping into the eyes of everybody. Hence, they have to be slim and trim over the ankle. To achieve this goal, most of the orthoses are either produced in a resin-type fashion or are made of metal (spring steel, titanium, aluminum) and leather. These materials sound very old fashioned – but metal versions have the advantage that they can be fabricated thinner than plastic, without losing strength.

An AFO fabricated in a Northwestern laboratory.

In contrast to the U.S.A., KAFOs (Knee-Ankle-Foot-Orthosis) are perhaps more common in Switzerland than AFOs. A KAFO is an orthosis that incorporates not only the ankle and shank but also the thigh. If a patient has some sort of weakness in his or her knee joint, KAFOs are normally prescribed. Again, in Switzerland, they are produced in either metal or resin. The resin is considered as 'top-notch', because colorful, slim and lightweight, yet highly functional orthoses can be produced. However, they have to have a near perfect fit, as it is nearly impossible to make adjustment once the orthoses have been made. Therefore, a plastic test-orthosis is quite often created to verify the fit and function of the future orthosis. If this testing orthosis turns out to be satisfactory the final resin orthosis is produced. Hence, resin orthoses need even more fabrication time than metal versions.

With metal KAFOs, great care is taken to fit them as closely as possible to the contour of the leg. A leg is normally fully casted, the cast rectified and the side bars of the KAFO are thereafter nicely formed according to the leg's shape. Once the orthosis has been tried on and possible final adjustments carried out, the metal side bars' edges are chamfered to achieve an optical illusion of slimness. Also the tops of the thigh's side bars are tapered in order to create a smooth transition between the bars and the final thigh band. If possible, color preferences of the patient are taken into account when choosing the leather enclosure of the KAFO's metal frame. This not only applies a personal touch to the new KAFO, but is also much more fun for the orthotist to work with.

A KAFO fabricated in typical fashion (resin) used in Switzerland.

Photos by Michael Prombs, CPO
Pro Balance Services, Kingsport, TN

Prosthesis and Prosthetic Methods

For prostheses too, the fabrication techniques here in the U.S. are different from what I am accustomed to seeing. For example, below-knee prosthetic sockets, which

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Beyond the Laboratory Walls:

Northwestern University programs in prosthetics and orthotics are partners with the Center for International Rehabilitation to share research results with people with disabilities around the world

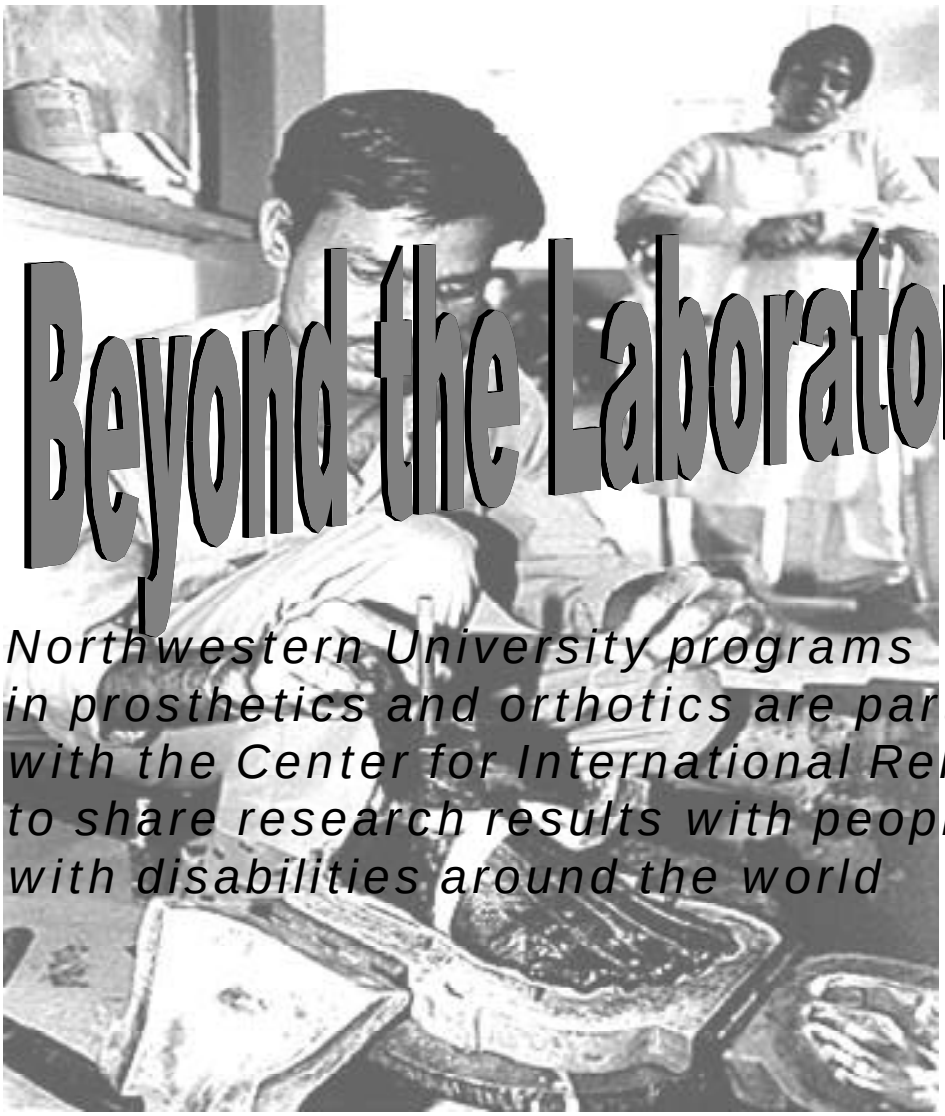

Photo by Eric Hilger

A technician in Jaipur, India working on a prosthesis was typical of the methods of providing prostheses in emerging nations as reported by Steve Kurzman, cultural anthropologist who conducted part of his doctoral research at Northwestern.

By Jan Little

In 1999, the Center for International Rehabilitation (CIR) was created with support from the National Institute on Disability and Rehabilitation Research (NIDRR). Northwestern University Rehabilitation Engineering Research Program (NURERP) and Northwestern University Prosthetic-Orthotic Center (NUPOC) were named partners in this new program to design, develop and deliver prosthetic and orthotic techniques and technologies to people with disabilities in low-income countries. CIR houses a rehabilitation engineering research center on Improved Technology Access for Land Mine Survivors and, in addition to the affiliation with the Northwestern University programs, coordinates efforts with Physicians Against Land Mines (PALM), the Rehabilitation Institute of Chicago (RIC) and the Department of Veterans Affairs Chicago Health Care System.

Prior to the establishment of CIR, a close relationship existed between the staff of NURERP and PALM's founder, William K. Smith, MD. During Dr. Smith's residency at RIC, he frequently worked with members of the Northwestern University/RIC prosthetic and orthotic research, education and clinical teams.

One of the cooperative projects being conducted between CIR and NURERP and directed by Dudley S. Childress is the development of simplified prosthetic components which may more be more easily fabricated and maintained in low-income countries. An important aspect of this project is using Northwestern's laboratories to

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Center for International Rehabilitation

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conduct tests of various materials and components which will be used in these less complex prosthetic components.

Another project involving a longtime member of the Northwestern/RIC prosthetic-orthotic team, Yeongchi Wu, MD., is the development of what Dr. Wu terms as "cheaper, better, faster" technique for fabricating prosthetic sockets. Field trials are being held throughout this year.

Because people with mobility restrictions have extreme difficulty obtaining appropriate wheelchairs in many of the low-income countries, CIR is also conducting cooperative projects with Whirlwind Wheelchair International, headed by Ralf Hotchkiss, a longtime user of wheelchairs, who has dedicated his career to teaching local residents of emerging nations to build wheelchairs using materials and techniques easily obtainable in that country. Whirlwind Wheelchair International has trained groups to build wheelchairs in Nicaragua, Zimbabwe, Mozambique, Cambodia and Guatemala. A workbook, Independence Through Mobility, developed by Whirlwind Wheelchair teaches the design, modification and construction of wheelchairs developed by the group.

Modules CIR has Planned for Training

Post-Surgical Management of the Residual Limb
Appropriate Material Processing Technology
Transtibial Prosthetics
Transfemoral Prosthetics
Physical Therapy, Mobility and Gait Training
Other Lower-Extremity Amputations
O & P Component Manufacture
Management Principles for Service Providers
Lower-Extemity Orthotics
Upper-Extremity Orthotics
Vocational Rehabilitation
CAD/CAM for O & P Design and Manufacture
Independence through Mobility
Management of the Pediatric Amputee
First Responders

A core set of educational materials and a series of short-term workshops being developed by CIR will utilize much of the knowledge and experience collected by NUPOC over its nearly half a century of existence. Work is being done to develop interactive teaching materials that cover a continuum of topics from instruction about design and fabrication of prosthetics and orthotics to emergency first responder training. Modules will initially be available in both English and Spanish.

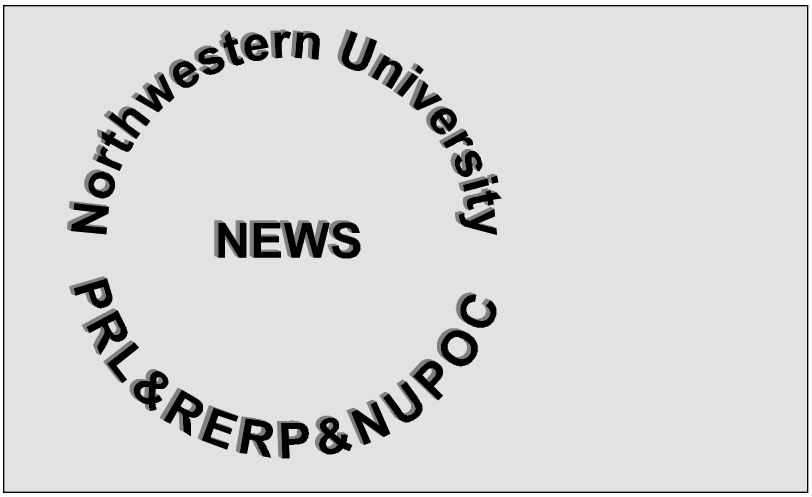
Clinical workshops will be arranged in various countries to provide upgrade training to rehabilitation professionals in low-income countries. Several courses in Below Knee and Upper Extremity Amputations have already been conducted in Slovenia and Guatemala.

The goals of CIR are many and difficult. The team assembled to meet those difficult challenges is experienced and capable. ❖

Visit NUPOC and NUPRL & RERP – We're on the Internet

You can enjoy a tour of the NUPOC classrooms, laboratories and the new library by going to www.nupoc.northwestern.edu on the Internet. You may also visit our prosthetic and orthotic research laboratories and read about the progress in our various projects by going to www.repoc.northwestern.edu.

We receive inquiries daily from many parts of the world. The Internet makes it possible to bring a doctor in Chicago together with a person with an amputation in Alaska or to introduce research personnel from Israel to researchers in Chicago so they may compare findings in pain studies. ❖



Weir Presents at European Biomedical Conference

Richard F. ff. Weir, PhD, presented the paper, "A Portable System for the Clinical Measurement of Gait Performance", coauthored by Dudley S. Childress at the 12th Conference of the European Society of Biomechanics. Trinity College, Dublin, Ireland, 27th-30th August, 2000. Weir, a native of Ireland, has also published a number of papers on the portable system for clinical measurement of gait, DURS – Direct Ultrasound Ranging System including an article in *Capabilities* for April 1997.

Childress Named to Department of Veterans Affairs Council

Dudley S. Childress, PhD, Director of NUPRL & RERP and NUPOC, was appointed for a two year term on the National Research Advisory Council (NRAC) for the Department of Veterans Affairs. The NRAC was established this year to provide research advice to the Department.

Heckathorne Participates in NIDRR-India Joint Working Group on Rehabilitation

Craig W. Heckathorne traveled to India from September 15 through the 28th as a consultant to the NIDRR - India Joint Working Group (JWG). Other members of the U.S. delegation to the JWG included Katherine Seelman, PhD, Director of NIDRR, Robert Jaeger, PhD, International/Interagency Affairs, NIDRR, Paul Ackerman, PhD, University of Maryland, and Adrian Polliack, PhD, Rancho Rehabilitation Engineering Program, Downey, California.

The JWG is an on-going cooperative effort between NIDRR (an Institute of the U.S. Department of Education) and the Ministry of Social Justice and Empowerment of the Government of India. The JWG is supported in part by the US-India Fund, which is available to advance health and welfare programs in India.

Members of the U.S. delegation reviewed rehabilitation facilities and prosthetic/orthotic clinics in Chandigarh, Hyderabad, Kanpur, Jaipur, and Delhi. The government of India operates a major facility in Kanpur, called ALIMCO, to manufacture prosthetic and orthotic components and rehabilitation aids, including wheelchairs, hand-crank tricycles, and other devices. The U.S. delegation reviewed modernization efforts at ALIMCO and made presentations to the ALIMCO senior staff on two areas that had been previously targeted by the JWG. Mr. Heckathorne presented an overview of electric-powered prosthetic components available world wide and socket designs used in electric-powered fittings. Dr. Adrian Polliack presented work on composite materials, with emphasis on fabric matrices pre-impregnated with resin, used in orthotic applications. The JWG concluded with a two-day meeting in Delhi to present the findings and recommendations of the U.S. delegation.

Childress was guest speaker at Dutch Meeting

Dudley S. Childress was the guest speaker at the 25th Annual Meetingof the Dutch Association of Rehabilitation Medicine (VRA) held in Gouda on September 29, 2000. During his brief stay in The Netherlands he also participated in a workshop concerning rehabilitation robotics and other advanced technologies organized by Mathijs Soede, Ph.D. at the Institute for Rehabilitation Research (iRv) in Hoensbroek.

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Hansen Receives Research Fellowship

Andrew H. Hansen has received a Predoctoral Associated Health Rehabilitation Research Fellowship from the Office of Academic Affiliations of the Department of Veterans Affairs. The Fellowship was awarded following approval of Hansen's doctoral dissertation proposal by the dissertation committee of Northwestern University's McCormick School of Engineering and Applied Science. Hansen's research investigates the role of roll-over shape of prosthetic feet in determining the alignment of transtibial prostheses. Please see *Capabilities* for July 2000 for an article on Hansen's research.

Miff Presents at ASB

Steve Miff, MS, presented a poster on "The Effect of Step Length and Cadence of the Instantaneous Forward Velocity of Walking" at the 4th Annual Conference of the American Society of Biomechanics. The conference was held July 19 through 22 in Chicago. Also attending from the NUPRL & RERP staff were Dudley Childress, Regina Konz, and Joshua Rolock.

IEEE/EMBS 2000 World Congress Meets in Chicago

The 22nd Annual World Congress of the Institute of Electrical and Electronic Engineers/Engineering in Medicine and Biology Society (IEEE/EMBS) was held on Navy Pier in Chicago, July 23-28.

On Saturday, July 22, immediately preceding the World Congress, a special workshop/symposium was held. Steven Gard, PhD was one of the main presenters at the workshop, "Pediatric Gait: A New Millennium in Clinical Care and Motion Analysis Technology". Gard presented "The Determination of Foot/Ankle Roll-over Shape: Clinical and Research Applications".

NUPRL & RERP staff members presented a number of papers reporting research projects. Papers presented included:

Hansen, A.H., Childress, D.S., "Roll-over Shapes of the Human Foot/Ankle Complex."

Rolock, J., Tucker, K., "A Device for the Computer-Aided Manufacturing [CAM] of Sockets for Limb Prostheses".

Sam, M., Hansen, A.H., Childress, D.S., "Mechanical Characterization of Prosthetic Feet Using a Prosthetic Foot Loading Apparatus".

Miff, S.C., Gard, S.A. and Childress, D.S., "The Effect of Step Length, Cadence, and Walking Speed on the Trunk's Vertical Excursion".

Hungspreugs, P., Heckathorne, C.W., and Childress, D.S., "Computer Simulation Tool for Upper-Limb Prosthesis Design".

Weir, R. F. ff., and Childress, D. S. "Portable Devices for the Clinical Measurement of Gait Performance and Outcomes"

Weir, R. F. ff., Childress, D. S., and Grahn, E. C., "Development of Externally-Powered Prostheses for Persons with Partial Hand Amputations".

Attendees of the World Congress were invited to an Open House the evening of Monday, July 24. Approximately 80 people toured the NUPRL & RERP laboratories and the Rehabilitation Insitute of Chicago (RIC) Sensory Motor Performance Program, directed by William Z. Rymer, MD, PhD. ❖

Paralympic Games are in Sydney: A Test for Athletes and Technology

By Jan Little

As this issue of Capabilities goes to press, the Paralympic Games of 2000 will open October 18 in Sydney, Australia at the site of the 2000 Olympic Games and end October 29. The 11th official Paralympic Games will feature over 4,000 athletes from 125 nations. Of the 18 sports of the Paralympics, 14 are also Olympic sports including swimming, archery, track, field, basketball, volleyball, weight lifting, table tennis, cycling, sailing, kayak and equestrian events.

In addition, the Paralympics include several other sports. Boccia, an adaptation of a game similar to bowling which is popular in Italy. Goalball, participated in only by athletes with sight impairment, uses a ball with a bell embedded in it and location of the ball as it moves about the court is determined by sound. Wheelchair rugby, a sport in which the object of play is to get a ball across the opponent's goal, is as rough as regular rugby.

The Paralympics had their beginning in 1948, when Sir Ludwig Guttman staged an athletic competition for ex-servicemen with disabilities who had been treated at Stoke-Mandeville Spinal Cord Injury Centre in Aylesbury, England. Sir Ludwig, who directed Stoke-Mandeville from the mid-40s through the early 70s, was an outstanding physician and an authority on the treatment of spinal cord injury recognized around the world.

More than that, Sir Ludwig had a genuine personal interest in men and women who had become paralyzed as a result of injury or disease. He initiated wheelchair sports not only for excercise, but as a means for those individuals to restore his or her self confidence and self image.

Photo compliments of wemedia.com

Brian Frasure (above) won the 100 m dash at the USA paralympic trials with a world record time of 11.17 sec. Brian, a graduate of the NU Prosthetic-Orthotic Center, also won the 200 m race. He is a prime contender for paralympic gold in these events and hopes to be the first runner in his class to go under 11 seconds in the hundred. The Paralympics will be covered live this year for the first time on the Internet at < www.wemedia.com > They are to be broadcast on streaming video. Persons interested in selected events and who don't see them live on streaming video can probably view them through the wemedia sports archives.

In 1960, the first Paralympic Games were held immediately following the Olympic Games in Rome, Italy. In 1964, the Paralympic Games were held in Tokyo, Japan. It was at these Games that the United States included female athletes — including this writer — on a team of 66.

Paralympic Games are about sports and competition, but they are about much more. The image of the person with a disability changes as the public watches persons with amputations — such as Brian Frasure and Tony Volpentest — run the 100 meters. It's hard to think of a man who can run only a few tenths of a second slower than the world record for so-called able bodied runners as disabled.

Sports for people with disabilities have also been a driving factor in product development. People who run road races and marathons in wheelchairs have designed wheelchairs from aircraft metals with highly innovative frame designs and other featureschanging the the entire concept of wheelchairs.

The Paralympic events have also had an effect on prosthetic components — particularly lower limb prostheses. The athletes have demanded higher and higher performance from prosthetic feet, pylons and other components. And face it, no manufacturer's testing facility could put those components to the test that the Paralympic runners give them.

The Paralympics have grown and developed a great deal over the past 40 years. For one thing, it now costs 170 Australian dollars for a pass to see the Games. In my day, we would have paid spectators to come — if we hadn't spent all our money to pay for our plane fare. ❖

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form the connection between the residual shank and the rest of the prosthesis, seem to be made for heavy-duty, long-term usage. Their wall thickness and stiffness are much greater than in Switzerland.

A typical socket design used in the U.S. for a prosthesis for a person with a transtibial amputation.

The general shape of the sockets in America corresponds to the techniques seen in Great Britain: relative high lateral walls and rigorous modeling of the patella tendon area in order to achieve weight bearing. The patella itself is quite often partly incorporated in the socket. According to my experiences, this type of socket is uncommon in Switzerland as our socket shape is influenced by German techniques. The lateral walls surround the femoral condyles in order to 'hook' the prosthesis onto these bony prominences. They are slightly flexible and therefore roughly half of the wall thickness seen here. The patella is completely uncovered. Weight bearing is in general achieved over the entire residual limb; hence, the modification of the patella tendon region is less pronounced or even absent.

A socket design with typical modeling of the patella tendon region.

Photos by Michael Prombs, CPO
Pro Balance Services, Kingsport, TN

The socket techniques and the different components used for above-knee amputees differ widely, ranging from up-to-date to old-fashion versions. According to my experiences, the old-fashion versions were rarely seen at my former working place. We generally fabricate above-knee sockets in a 'two- layer' system: an inner flexible plastic socket and a resin frame, which is rigid and hence capable of bearing weight. The anterior and posterior 'windows' provided by this frame technique allow the flexible plastic socket some degree of deflection. All our patients appreciated this socket type, as it was more comfortable for sitting. Another positive point was mentioned by a grandfather, who said that it was so much nicer to feel rather than just observe his grandchild sitting on his thigh.

Which leg is the prosthesis?

Photos by Michael Prombs, CPO
Pro Balance Services, Kingsport, TN

As with the orthoses, the final appearance of the prosthesis is a very important factor. Many of my Swiss colleagues take the time to shape the prosthesis according to the remaining limb as accurately as possible. The remaining legs' contours are drawn and corresponding circumferential measurements are taken. The shank and/or thigh are then shaped according to these drawings and measurements. It is also not unusual to apply the final touch of cosmesis in cooperation with the prosthetic wearer. This is especially the case when a skin-like cosmesis is desired. In our laboratory, we used a product from the U.S. that was sprayed with a pressure air pump onto the final shaped cosmesis. The smell of it was awful but the outcome was very nice indeed. This 'artificial skin' could then be colored with normal color-sprays according to the patient's specific skin tone. In most of the cases, even very critical patients were highly satisfied with the final outcome.

Training Comparison

The training of prosthetists and orthotists is totally different from that offered in the U.S.A. First of all, in Switzerland the difference between prosthetist and orthotist is not made, because both professions are incorporated in one. The entire education lasts four years and takes place in a different laboratory for each student. Each laboratory that would like to train a student has to fulfill certain rules and regulations. In addition, to guarantee

an equal standard of education, these laboratories follow a specific timetable.

Once per week, all students gather together for classes, which are held in two different schools: one in Lausanne for the French speaking students, and one in Zurich, for the German speaking students. Italian and Rhaeto-Romansh speaking students have to choose between the two schools, because unfortunately the prosthetic/orthotic community is too small to provide separate classes for them.

In the laboratories, each student is supervised by a personal supervisor. This personal supervisor is also responsible for the student's performance. The aim is to introduce the student step-wise into the full variety of prosthetic and orthotic domains. No demonstration patients exist; therefore, each product is 'real'. By the end of the third year, most of the students are able to work independently.

The final exam (one week) takes place at a different laboratory than the one where the student has been educated. This is always an additional challenge, not only because the environment and the personnel of the laboratory are unknown, but also because the instruments and tools are slightly different. During this final examination week, the students are tested for two days in theoretical subjects such as mathematics, anatomy, pathology, materials, anatomical and technical drawing. Unfortunately, there are no biomechanical classes available.

During the practical part, which lasts three days, all aspects of the basic manufacturing processes using the different materials are tested. The only thing known to the students in advance is that they have to produce a wooden foot and its ankle part according to a provided shoe to demonstrate that they are able to shape a human body part so that it is anatomically correctly. All other tasks involving casting, plastic and metal processing are changed every year. The tasks to be performed are presented to the students at the beginning of the three days practical session. Between eight to ten students graduate each year from the school in Zurich; the number that graduate from the school in Lausanne is unknown to me.

Rehabilitation Technology

In the general rehabilitation sector in the U.S.A. it is fascinating to see how many adaptations, more precisely additions, are readily available for people with different disabilities. In elevators, for instances, wherever one goes there are small Braille signs on every button plate. According to my knowledge, this does not exist in my country. Some of the elevators in the U.S.A. not only have an audible 'beep' at every floor, but also have a voice informing the riders at which floor they have arrived. For incoming riders, the voice informs the direction the elevator is traveling! Incredible – and for me, coming from the countryside, this first experience with a 'talking' elevator was almost a touch of science fiction!

The different levels of the Rehabilitation Institute of Chicago seem to be all color-coded: every floor has a different appearance, thus facilitating the orientation. Across the street, in a 'simple' parking garage, the architects went even a step further. Not only are the different levels color-coded, but the different floors also have specific music tunes! Hence, except for smell and taste, all senses are addressed: tactile (Braille signs), vision (color code) and hearing (music tunes). These additions help persons with or without disabilities to cope with their environment, and are also a great help for newcomers like me. I was fascinated and very impressed to see technical results so neatly implemented.

Although I have only been at NUPRL & RERP for a relatively short time, I had already the chance to participate at many different events. One was the Scholars' Meeting of the National Institute on Disability and Rehabilitation Research (NIDRR), in Washington, DC. I also attended the annual meeting of the Rehabilitation Engineering and Assistive Technology Society of North America (RESNA) at Orlando, Florida. Both gave me a great insight of the different possibilities in assistive technology and services which exists for people with disabilities here in the United States.

For example, at both meetings there were translators who signed for the hearing impaired. It was fascinating to watch them working. At the NIDRR conference, the service for hearing impaired was even more sophisticated. A person sitting in front of me was handling a special three-level keyboard, which was connected to a laptop. This device attracted my full attention. The operator typed, in a shorthand-writing manner, whatever she heard. The conversation or speech was directly displayed in full on the laptop screen, enabling the hearing impaired person sitting next to her to follow the conversation without any delay. This person lost her hearing capability as an adult and was not so fluent in sign languages like a person born deaf. Therefore, she just gets another type of assistive device. This little special three-level keyboard and its operator's skills impressed me deeply.

During our tour through the Capitol Building in Washington, DC, it seemed perfectly natural for them to offer tours particularly adapted to the needs of blind persons. Specially trained tour guides enabled the blind participants at the NIDRR events to get an impression of this great building. The participants were guided towards some

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The VA Presents

News from the Department of Veterans Affairs

VETERANS BENEFITS ADMINISTRATION'S (VBA) INDEPENDENT LIVING PROGRAM (ILP)

Coordinated by Robert M. Baum
Prosthetic Network Manager, P&SAS SHG,
VA Headquarters, Washington D.C.

By Gretchen C. Stephens, MPA, OTR/L

The Independent Living Program (ILP) is part of VA's Vocational Rehabilitation and Employment Program (VR&E). This program "helps veterans with service-connected disabilities that have a demonstrated employment handicap in two ways:

1. Veterans who are feasible for employment are provided assistance in preparing for, obtaining, and maintaining suitable employment.

2. Veterans who cannot work because of the severity of their disabilities may be provided assistance to improve their ability to live as independently as possible." (VBA intranet)

The VR&E Program (also known as Chapter 31) consists of 3 components:

A.Extended Evaluation
B. Independent Living
C.Education and Training

For persons with a traumatic brain injury, VBA's Independent Living Program may be very helpful in addressing community reentry skills. A vocational goal is not necessary to obtain approval for these services. The ILP is sometimes used following acute rehabilitation to assist with ongoing treatment needs, transitional living, and community reentry. There is a 24-month (may be extended) limit on these services which may include:

A. An evaluation to determine independent liv ing needs
B.Training in activities of daily living
C. Guidance and support throughout the reha bilitation program
D. Technological assistance
E. Personal adjustment counseling
F. In some cases, training to improve ability to reach a vocational goal

- **Eligibility:**

1) A combined VA compensable disability rating of at least 10 percent, as a result of active duty military service on or after September 16, 1940, and

2) a discharge or release from active duty under other than dishonorable conditions.

- **Time Limitation** - The veteran is eligible to apply for Chapter 31 benefits up to 12 years from the date of the service-connected rating.

Application - The veteran or veteran's representative must initiate a request for these services by completing the Disabled Veterans Application for Vocational Rehabilitation (#28-1900, http://www.vba.va.gov/pubs/forms/28-1900.pdf)

- **Process** - Active duty military personnel may apply under the Disabled Transitional Assistance Program (DTAP). This makes it possible to start the application process while waiting for conversion to veteran status. A "MEMO" rating may be given to active duty personnel who have sufficient impairment resulting in their inability to return to active duty.

A medical history is also required when applying for the Chapter 31 program. Therapists' recommendations are very important and need to suggest that with these services, improvement is anticipated. It is also important to indicate that the goal is to improve functional independence in the targeted environment, e.g., home,

assisted living. It should also include how this might be achieved, such as through community re-entry services and personal life coaches. The patient must be at a high enough level to actively participate in the program.

Once the application has been received and services deemed feasible, a Vocational Rehabilitation Counselor or Contract Case Manager must obtain three bids from providers in the community who can deliver the recommended services. There are specific criteria that must be met by the proposed service provider to ensure that the services provided will be of good quality and by competent providers. The vendor must also have a published fee schedule. The Vocational Rehabilitation & Employment Section will then select the service provider.

Every state handles these programs somewhat differently. The Veterans Benefits Administration (VBA) web address is: http://www.vba.va.gov. If you have further questions, please contact your local Veterans Benefits Counselor. Rebecca Mullins (813) 972-2000 Ext. 6185 and Jim MacAulay (813) 972-2000 Ext. 7830 at the Tampa VA may be able to provide assistance. ❖

A special thank you to Jim MacAulay, Vocational Rehabilitation Specialist, and Bill Hunter, Veterans Benefits Counselor, from the Tampa VAMC who provided an overview of the program and the application process.

CONGRATULATIONS AND GOOD LUCK!

Harry E. Marshall, Physical Medicine and Rehabilitation Strategic Healthcare Group, VA Central Office, has announced his retirement after a truly remarkable career of 31 years in federal service. You can find various publications of his in Rehabilitation Management Journal, Japanese Journal of Occupational Therapy, Journal of Rehabilitation Administration, Archives of Physical Medicine and Rehabilitation, and VA Practitioner. A very nice write-up on Harry's career can be found in the September 2000 PM&RS VAHQ Newsletter which can be found on the PM&RS website. We wish you good luck and God Speed.

Please send us your articles, success stories, comments or suggestions for future issues in the VA Presents. E-mail: Robert.Baum@Mail.VA.Gov. Address: PSAS SHG (113), 810 Vermont Ave., NW, Washington, DC 20420. Phone (202) 273-8515. Fax: (202) 273-9110.

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statues so that they could touch them while the guide was explaining and telling the stories about them. Details about the different rooms and hallways were given in a three-dimensional fashion, so that the participants got an impression of the space. At the end, all of them received contoured maps and information printed in Braille language. I was very impressed.

The diversity and variety of wheelchairs fascinated me most at the RESNA conference in Orlando. What a richness of adaptations and possibilities! Among the powered wheelchairs with diverse combinations of small and large wheels for better terrain adaptation was a model whose driving wheels were right underneath the rider's seat. These wheels were capable of turning 360 degrees around the vertical axis, enabling the driver to travel sideways and move into and out of very narrow spaces. But the icing on the cake was a wheelchair that was able to 'stand-up'. It raised and balanced the chair on the two rear wheels so that the rider was on eye-level with his or her walking companions. Even when moving on its two back wheels, the chair was fully stable and provided complete security to the user. Impressive indeed!

Unfortunately, powered wheelchairs are seldom seen on our streets in Switzerland, and I have never come across one of these highly specialized and multifunctional wheelchairs like I saw in Orlando. I hope that in the near future, these wheelchairs will be common and not an exotic part of the Swiss rehabilitation process.

In general, the problems we are facing in the prosthetic and orthotic field are all more or less the same all over the world. What makes it so fascinating, however, is to see how other countries, cultures and societies, are trying to overcome these problems in their unique and particular way. To have the opportunity to take part, once more, in a different culture and society is mind stretching, inspiring and informative, but to be in Chicago, particularly at the NUPRL & RERP is just wonderful! ❖

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