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Research Project Report

Clinical Experience Using Real-Time Measurement of Instantaneous Gait Velocity as an Outcome Measure

By Richard F. ff. Weir, PhD and Deborah Gaebler-Spira, MD***

**Northwestern University Rehabilitation Engineering Research Center, 345 E. Superior Rm1441, Chicago, IL*
***The Rehabilitation Institute of Chicago, 345 E. Superior, Chicago, IL*

Improved ambulation is frequently a primary goal of treatment for people with cerebral palsy (CP). In the clinical setting, few direct methods other than observation are available to provide feedback on the effectiveness of various treatments. For the past year we have been using a device known as DURS (Direct Ultrasound Ranging System) (*Capabilities*, Vol. 6, No. 2, April 1997) to quantitatively monitor the effect of various gait interventions on the treatment of children with cerebral palsy. The DURS measures the instantaneous forward (anterior-posterior) velocity of the gait of children with CP and then uses these measurements to determine change in functional gait parameters of these children in response to treatment.

Cerebral palsy is a condition that results from damage to the central nervous system, and causes problems with movements and posture (Blasco, 1992). Cerebral maldevelopment, infection, genetic syndromes, cerebral anoxia and interventricular hemorrhage have all been identified as factors that can lead to cerebral palsy. The reported incidence of cerebral palsy varies from 1.5 to 3 cases per 1000 people (Dabney et al., 1997). The location of the brain injury determines the physiologic categories of spastic, athetoid, dystonic and rigid. The anatomic classification identifies a patient with quadriplegia, diplegia, or hemiplegia based on the limbs involved in the disease (Dabney et al., 1997).

Diplegia involves both lower limbs more than the upper, and quadriplegia affects all four limbs. A person with hemiplegia has involvement of both limbs on one side of the body, with the upper extremity more affected than the lower (Mashilov et al., 1992; Dabney et al., 1997). Spasticity is the most common tone abnormality and is characterized by an increase in resistance to speed dependent stretch of a muscle. Gait is often impaired in people with cerebral palsy due to spasticity in the leg. The impact on gait is partially determined by the anatomic location and degree of muscle spasticity. The hip, knee, ankle and foot are common sites for manifestation of cerebral palsy. Gait performance is varied in every case, but spasticity in these sites often leads to predictable gait deviations.

Interventions used in the treatment of children with CP are: a regimen of physical and/or occupational therapy;

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the prescription of orthotic aids, typically some form of ankle foot orthosis for the affected side(s); the use of Botulinum Toxin A (Botox), oral medications, neurosurgical intervention and orthopedic interventions.

Botox is administered locally to spastic muscles, typically in the legs. Botox is produced by anaerobic bacteria, and is the source of a well-known food poisoning (botulism). Botox works to effectively block signals from the Central Nervous System, temporarily reducing spasticity. Botox is commonly used in younger children when the dynamic component of joint deformity is greatest. The duration of the effect of Botox is variable, peaking 3-6 weeks with a reinnervation beginning at about 4 weeks and return of spasticity at about 12 weeks.

Intrathecal Baclofen administered through implanted Baclofen pump is another method used to reduce systemic severe spasticity. These are surgically implanted pumps which also serve to block signals from the CNS, again temporarily reducing spasticity. These pumps have reservoirs of the drug and dose the patient at a variable or constant rate. The pump is refilled every 3 months.

Oral medications such as oral baclofen and tzanidine are also used to decrease generalized spasticity. Oral medications frequently have side effects that patients, in particular children, do not tolerate. However, oral medications are easy to use and are safe. Orthopedic surgery is utilized as the deformity interfering with gait becomes a more fixed, or soft tissue, contracture. This corresponds to maturation of gait around seven years of life. A 3-D gait analysis is often used to precisely define kinematic and kinetic information.

The goal of neurosurgical procedures, selective posterior rhyzotomy, for example, and Intrathecal baclofen (ITB) is to reduce global spasticity. All of the previously mentioned interventions are usually used in some sort of combination such as a program of physical therapy along with the prescription of orthoses and the use of Botox.

There are numerous possible interventions that range in degree of severity and complexity depending on the amount of the impairment involved. Many of these treatments are permanent and consequently it is important to be able to quantify the amount of improvement any given procedure will likely provide a particular patient. To this end, as an extension of their clinical care, children with CP who attend the CP clinic at the RIC have their forward gait characteristics recorded by the DURS while they are waiting to see their physician. The DURS consists of a transponder worn by the subject, a Base unit infrared (IR) emitter/ ultrasound (US) receiver, and a Laptop computer to store and process the data. The DURS operates by emitting infrared pulses from the base unit to trigger the transponder to emit an ultrasound pulse back to the base unit. The computer measures the time taken for the US pulse to travel from the transponder to the base unit. By calibrating for the speed-of-sound this time is converted into the distance between the two units. Since a distance measurement is taken at a known rate, a measure of how distance changes with time (i.e. velocity) is obtained.

When the transponder is placed posteriorly at the approximate level of the body center-of-mass (BCOM) the cyclic nature of the resulting instantaneous velocity profile is used to compute average walking speed, cadence, stride length and time, step lengths & times for each leg (possible symmetry indices), peak-to-peak change in the instantaneous velocity (Walking efficiency), and time taken to achieve steady-state walking. These gait parameters are all produced in real-time, enabling a clinician to implement ideas or changes and then to immediately see effect of those ideas or changes on that person's gait.

To date we have used DURS to measure the instantaneous anterior-posterior (forward) velocity of the gait of children with CP pre/post Botulinum Toxin A, of adults with CP pre/post Intrathecal Bactlofen (ITB), and of both, where possible, with and without any orthotic aids normally used by them. The children ranged in age from 3 to 16 years and were diagnosed as having spastic hemiplegia or spastic diplegia due to their cerebral palsy. Of those children with hemiplegia the majority utilized a unilateral ankle foot orthosis (AFO). A number also had a shoe insert on the contralateral side. One child used bilateral AFOs and one child

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GOT GRIT?

The Breaking New Ground Program at Purdue University has made it possible for hundreds of farmers to continue tilling the soil and caring for their animals after disabling accidents

By Ned Stoller, Purdue University

John Campbell farms just as he did before his accident by using an extended gear shift on his pickup (above) and a zero pressure hydraulic hook-up on an older tractor (below).

Grit. It's certainly a very valuable resource, but who has it?

If you explored around Burnettesville, a small town in White County, Indiana you would find such a man. His name is John Campbell. John Campbell was farming alone after the death of his father in the summer of 1997. He was out round baling hay one blistering afternoon when a clump of hay began to clog the baler. To prevent the baler from jamming, he stopped the tractor and grabbed the hay to pull it out of the baler. Suddenly, the baler belts grabbed the hay ,jerked it into the baler and pulled John's arm in with it.

Quick thinking may have saved John's life

With his arm wedged between two running belts, John had the clarity of mind to pull off his shoe with his free arm and jam it into the balers drive chain. The shoe threw the chain off the sprocket, the belts stopped turning, and John was free. Unfortunately, the burns from the belts were so severe that his arm had to be amputated about half way between the elbow and hand. Within weeks after the amputation, John was back out on the tractor raking hay. Now that's grit.

In the months after the amputation John decided there was no way this injury would stop him from farming. Now the question was "How do you operate a 500 acre grain and hay farm with 40 beef cows if you only have one arm?" What did John do? He contacted the Breaking New Ground Outreach Program (BNG), a program at Purdue University designed to assist farmers as they modify their equipment following a disabling injury or illness.

Equipment modification and a bit of funding from DVR

BNG staff visited John's farm and provided resources and information on modifying agricultural equipment for his amputation. They did an evaluation of his farmstead and provided suggestions for equipment modifications. Breaking New Ground provided recommendations to Indiana's Division of Vocational Rehabilitation to provide funding for the necessary equipment. Based on the reported recommendations from BNG, Vocational Rehabilitation funded several modifications that have helped John on his farm.

One and a half years after the injury, John has completed the modifications and is successfully farming again. Because of John's grit, he has been able to continue farming with the funding from Vocational Rehabilitation and recommendations of Breaking New Ground. The new equipment used by John includes a zero pressure hydraulic hook-up system on an older tractor, a Prehensile Hand terminal device for his prosthesis, a smaller chainsaw, chains and one hand clasps for gates, a foot operated header control for his combine, and an extended gear shift in his pickup truck. ❖

For more information on farming following a disabling injury or illness, call Breaking New Ground at (800) 825-4264.

Report About Use of Prostheses in India and Cambodia

"Did You Step on a Mine?"

By Steven Kurzman

Steven Kurzman, a candidate for a PhD in Cultural Anthropology at the University of California at Santa Cruz, has conducted ethnographic research about prosthetics and those who use them in Chicago, India and Cambodia. Steven also shared his experiences in an article in* Capabilities *for October 1997, while he was conducting research at Northwestern University

Photo by Eric Hilger

A technician at the Jaipur Limb Centre puts the finishing touchs on a Jaipur foot, wrapping it with rubber and nylon tire cord.

I travelled to India and Cambodia this past Spring to study appropriate prosthetics technology in developing countries. While most amputations in India result from railway accidents and diabetes, Cambodia is emerging from nearly thirty years of civil war and fratricide, during which an estimated 4-10 million land mines were laid. The result is some 30-40,000 amputees, nearly all of whom have stepped on or picked up mines and unexploded ordnance.

The true extent of the mine problem is not revealed in these numbers though, but by the atmosphere of normalcy around land mines and Cambodians acceptance of them as an everyday problem. Amputations, land mines, and the political violence that surround the populus are simply facts of life. I gradually came to appreciate firsthand the irony of this 'everyday' quality of amputations and physical disability through interacting with Cambodians. When I first met people, they politely asked the usual questions about my nationality, name, family, and age. Then, referring to my below-knee prosthesis, they inevitably asked, "Joa-un meen dtay?" "Did you step on a mine?"

Cambodians have little choice about avoiding mines

In Samlot, a particularly war-torn district in the northwest part of the country, I also observed how this directly affects families and communities. Former Khmer Rouge communist guerillas mingled with peasants recently returned from refugee camps as they built villages inside marked mine fields. Men cleared farmland and erected houses as children ran laughing behind bright red signs with skull and crossbones markings, reading "Danger! Mines!" The problem is not ignorance or stupidity, but poverty. The vast majority of Cambodians are peasants and have little choice but to pass through mined areas while clearing farmland, herding cattle, chopping wood, or fetching water, all necessary parts of rural life.

Over the past 20 years, Cambodians have found ways to ingeniously devise their own crutches and prostheses from locally available materials, such as wood, bamboo, rattan, sheet metal or shell casings, car tires, and buffalo hide. More recently, organizations such as Handicap International, the International Committee of the Red Cross, the American Red Cross, and Veterans International have established programs to provide most amputees with free prostheses made of polypropylene, Pelite, and rubber. There is also a prosthetics school in Phnom Penh.

India, on the other hand, while poor, has pioneered appropriate prosthetics technology for Third World countries. In the early 1960s, Dr. P.K. Sethi noticed that many Indian amputees were not wearing their British-made prostheses, and perceived a need to develop prosthetic legs specifically tailored for India. So Sethi teamed up with a local sculptor named Ram Chandra to design what is now called the Jaipur limb, after the city where they developed it. The crucial characteristic of the Jaipur limb is that it is not only a prosthesis "a tangible thing" but a philosophy of how to produce appropriate and sustainable technology. The basis of the philosophy is that it is intended to be culturally appropriate to amputees' needs, and to be made with locally available materials by locally trained craftsmen.

Photo by Steve Kurzman

"A pile of unexploded ordnance (UXO) in Samlot district, Battambang province. Many Cambodians risk collecting UXO to recycle the explosives and metal.

Sethi describes India as a "floor sitting culture," one in which people squat or sit closely to the floor much of the time to socialize, eat, work, and use the toilet. Accordingly the Jaipur foot is designed to allow enough dorsiflexion for users to squat. The Jaipur limb is also socially appropriate to India because it is a plug socket and able to accommodate problematic stumps resulting from poor surgeries that cannot tolerate total contact sockets. The sockets are made from aluminum or PVC irrigation pipes which, like the rubber for the feet and the leather for the suspension strap, are produced in India. Another truly local feature is that services are provided free of charge through funding from a local Jain religious philanthropic organization and the Indian government.

The Jaipur Limb is not widely used

The Jaipur limb — or various versions based on Sethi's philosophy — is produced at two hospitals in Jaipur and by mobile clinics scattered around India. Although it is the best model for Third World appropriate, sustainable prosthetics technology to date and has spread globally to Africa, Central America, and southeast Asia, it has not spread very widely within India and remains largely centralized in Jaipur. When I visited one of the clinics in Jaipur, a number of amused and astounded Indians asked me, "You, too, came all the way to Jaipur for your limb?" Sethi and his colleague Dr. Pooja Mukul are currently developing a plan to train teams of mobile technicians who would service rural areas, thereby creating a 'mobile prosthetics field' or delivery infrastructure.

In many ways, Cambodia and India are very different from one another socially and politically and, accordingly, have differing current needs in prosthetics. India is poor, but politically stable and developing quickly, and has local funding, manufactured materials, crafts and technical labor, but little in the way of prosthetics infrastructure yet. They will no doubt be able to envision and create a uniquely Indian prosthetics field. Cambodia, after years of war and an ongoing land mine problem of epidemic proportions, has a good deal of crafts labor, but manufactures few materials, has no local funding, and has little infrastructure of any kind. The challenge ahead is to help Cambodians develop both prosthetics technology and a prosthetics field that can eventually be self-sustaining. ❖

In addition to Steve Kurzman's work in cultural anthropology, the Prosthetic and Orthotic Program at Northwestern's training works closely with the Center for International Rehabilitation, which is located nearby. The program also has communication with Tony Barr and the Barr Foundation.

Center for International Rehabilitation Establishes New Programs in Central America

The Center for International Rehabilitation (CIR), a not-for-profit, non governmental organization dedicated to improving rehabilitation services and, in turn, the quality of life for individuals with disabilities worldwide, has recently established a satellite office in Guatemala City, Guatemala. This office brings the CIR another step closer to meeting its goal of improving the technical skills of rehabilitation professionals in the Central American region. To further that goal, the CIR signed a Memorandum of Understanding with the Organization of American States (OAS) to jointly establish rehabilitation programs for persons injured by landmines and other war-related injuries. According to Dr. William Kennedy Smith, CIR President, "This agreement allows for a collaboration of resources and technologies between the two organizations in an effort to ensure full equality for people with disabilities. It is an important step for patients and the international rehabilitation community, as well."

In accordance with these efforts, the CIR held its first Prosthetic/Orthotic Workshop at the Guatemala office in December of 1999. The workshop was coordinated and led by senior CIR staff members Hector Casanova and Dr. Yeongchi Wu. This one-week course provided upgrade training for prosthetic and orthotic professionals in Guatemala. According to Dr. Wu the response to the workshop was overwhelming, "The number of people attending the workshop exceeded our expectations. It is extremely gratifying to know that these rehabilitation professionals are truly interested in improving their training in the field."

"Throughout the month of January, the CIR will be conducting several more workshops to improve the technology and rehabilitation techniques used by service providers in Guatemala," stated Casanova. Dr. Allen Heinemann, of the Rehabilitation Institute of Chicago, will conduct a workshop on Outcome Measures for amputees as a means of tracking the results of treatment. This workshop will provide a method for quantifying feedback and improving treatment procedures. Additionally, Michael Quigley, CPO, will direct a course on Below-Knee Amputation and Laura Hamilton, OT/MPH, will direct a course on Upper-Extremity Amputation. These workshops will focus on the basic principles of prescription and fitting procedures.

In the future, the Center for International Rehabilitation looks forward to continuing and expanding its work in the Central American region, as well as other low-income countries devastated by landmines. ❖

The Barr Foundation Works in the Third World

Tony Barr, Founder and Director of the Barr Foundation, keeps in regular contact with the Northwestern University Prosthetics Research Laboratory and Rehabilitation Engineering programs via e-mail. Tony, when last heard from, was returning from Guyana and will visit several African countries in February with a large collection of used prostheses and orthoses which have been donated by people in the United States. The prostheses and orthoses will be stripped down and the components used to fabricate usable devices for people in the countries visited. During the last year, Tony and his associate, John Zeffer, worked to set up amputee assistance programs in Mexico and Belize. John is currently working in Cambodia with people who have become amputees as a result of encountering land mines.

Another associate of Tony, Michael Reid, is currently working in Sierra Leone. Reid, a retired U.S. Army pilot, founded, the World Limb Project. Like other emerging programs, World Limb Project seeks to provide prostheses which can be fabricated and maintained in third world countries. For a full story about Mike's work in Sierra Leone, where amputation is used as punishment by terrorists, visit www.fayettevillenc.com/foto/news/content/1999/tx99dec/f02leone.htm. ❖

Dr. Aisen visits NUPRL&RERP

Mindy L. Aisen, MD, Director of the Department of Veterans Affairs Rehabilitation Research & Development Service toured the Prosthetics Research Laboratory and viewed the new VA Chicago Motions Analysis Laboratory (VACMARL) on November 3, 1999. Dr. Aisen was accompanied by Laura Bowman and Bob Potts, Assistant Directors of DVA RR&DS.

Richard Weir Addresses European Academy

Richard F. *ff.* Weir, PhD Research Assistant Professor, presented a poster entitled: Pilot Study Using Instantaneous Gait Velocity Analysis as an Outcome Measure in the Clinical Management of Children with Cerebral Palsy Receiving Botulinum Toxin A and Adults with Intrathecal Baclofen. at the European Academy of Childhood Disability in London 21st Oct - 23 Oct, 1999.

Jack and Elaine Uellendahl Move on from RIC and Northwestern

Jack Uellendahl, CPO, Director of Prosthetic and Orthotic Clinical Services at the Rehabilitation Institute of Chicago, resigned from that position to join Hanger, Inc. as an upper limb specialist in the Phoenix, Arizona area. Jack worked closely with NU PRL&RERP staff in clinical applications of research and co-authored numerous papers, particularly on upper-limb prostheses.

Elaine Uellendahl, CP, resigned from her position as an instructor in prosthetics education at Northwestern University Prosthetic-Orthotic Center.

Gard, Rolock & Weir are Appointed to PM&R Faculty

Steven A. Gard, PhD, and Richard F. ff. Weir, PhD were named Research Assistant Professors in the Northwestern University Medical School Department of Physical Medicine and Rehabilitation and adjunct professors of Biomedical Engineering in the Northwestern University McCormick School of Engineering and Life Science. Joshua Rolock, PhD, was named a Research Associate Professor at Northwestern University Medical School Department of PM&R.

Brian Frasure Sets New World Record in Track

Brian Frasure, who graduated from the Northwestern University Prosthetic-Orthotic Center in 1997, has set a new world record for the 100m dash in track. Frasure's record, 11.33 seconds is for athletes who use lower limb prostheses. Frasure's time is so close to that set by athletes who do not have amputations that he was featured in an article in the October 1999 issue of *Sports Illustrated* magazine.

Gard Presents Lecture at Children's Memorial Seminar

Steven A. Gard, PhD, presented, "What Causes Vertical Movement of the Body During Normal Walking?" at the special seminar at which Diane L. Damiano, PhD, was honored by Children's Memorial Hospital. Dr. Damiano is assistant professor of orthopaedics at the University of Virginia and Research Director of the motion analysis laboratory at Kluge Children's Rehabilitation Center and Research Institute, Charlottesville, VA. ❖

Effective 3/1/00 our web and e-mail domain (nwu.edu) will change to "northwestern.edu".

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had only a shoe insert on the involved side. The amount of orthotic intervention is a good indicator of the level of impairment to a particular child's gait. For the children with spastic diplegia, the majority used bilateral AFOs, one used a SWASH brace, and one had a shoe insert. In addition to bilateral AFOs one child also used a walker to ambulate.

To date no clear pattern has emerged from our monitoring of the effect of interventions on these children's gait. This is not so surprising given the variability in type of treatment, type of cerebral palsy, level of functional impairment, and differing ages of the children. On average, our results suggest that some form of orthoses will benefit those children with spastic diplegia. However, the results for the children with hemiplegia are not so clear. In both groups there was a lot of individual variability both in terms of the severity of their cerebral palsy and the type of orthotic device used.

In general, our experience is that Botox does not improve (increase) gross gait parameters (walking speed, cadence, step length) for those persons with mild cerebral palsy, a finding that has been reported by others (Metaxiotis & Doerderlein, 1999). Of those children who received Botox only one child with medium severity (Gross Motor Function Scale [GMFS 2]) spastic diplegia, appears to show any marked change in gross gait parameters that can be attributed purely to Botox. This child's mean velocity, cadence, and step length all increased independent of whether AFOs were or were not worn. In addition, as the Botox wore off for this subject there was a decrease in mean velocity, cadence, and step length.

The only other child to show any appreciable change in response to botox showed an improvement in step length symmetry due to the Botox. This youngster thought his gait was improved through the use of Botox and his father thought he walked 'better'. The argument is made that one reason for administering Botox is to enable patients to achieve 'foot-flat' which allows them to fit into their AFOs more comfortably. This being the case one would expect to see an increase in gait parameters associated with gait while wearing an orthosis.

The third group we have been monitoring is a group of adults who had Intrathecal Baclofen (ITB) Pump implanted to help reduce their spasticity. Each member of this group had cerebral palsy and was ambulatory. In all cases an initial decrease in mean velocity was noted as dose was increased, mean velocity then started to increase (still below pre-pump levels) with increasing dose level. It is thought that before receiving the pump these individuals were "walking on their spasticity", that is their spasticity, although uncomfortable, was making their legs stiff enough for them to be able to walk. Upon receiving the pump, a muscle relaxant is administered, causing a reduction in spasticity, resulting in decreased walking speed. Further increases in dose do not appear to increase walking speed by increasing step length but rather by increasing cadence, i.e. instead of taking longer steps one takes more steps.

Cerebral Palsy gait interventions are numerous, and complex and their effect needs to be quantified. Cases that are clinically improved but are not supported by the objective data need to be targeted and reviewed for justification of treatment. The use of a system like the DURS has allowed the effect of clinical treatments on each child's gait to be measured then and there in the clinic. Our experience in monitoring the effect of many of these interventions is that they must be considered on a case by case basis given the degree of variability in both the type of cerebral palsy and the level of functional impairment. For groups of children, gross gait parameters do not appear to change noticeably for many of the interventions described here. It is therefore important to determine whether these are the correct parameters to monitor and to determine what other effects (comfort, quality of life, etc) might also be issues. Further study of larger numbers of case matched controls will be needed to define which populations clinically and functionally benefit from treatment. v

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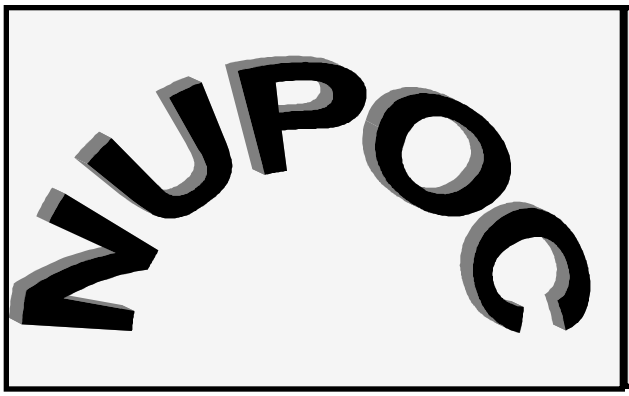

BEYOND 2000: Where Will P & O Education Take Us

By Mark Edwards, CP
Director of Prosthetic Education
Northwestern University Prosthetic-Orthotic Center

If you had a crystal ball to see what the future holds, what would you see?

In prosthetics and orthotics education, without using a crystal ball, I see many changes in our future. This essay will discuss the possible changes about to take place in P & O education. Education is an important area because it works hand in hand with research and clinical practice. These three areas meld together to ultimately provide better service to the consumer. The person wearing and using prostheses and orthoses.

Let's first look at the change in how P & O education is delivered today. We have already witnessed the creative uses of technology in education. Computers, Internet use, video conferencing, distance learning, special study modules, etc. have changed the way we teach. It has also changed the way students learn. Both teachers and students are using technology for education in unique and interesting ways. This change in pedagogical practices will hopefully produce practitioners that are life-long learners. It is imperative that students learn the need for continued education and training. The profession is changing rapidly. If you don't keep up, you will be left behind.

Having access to education is also changing. Curriculum needs to be developed that can be delivered with various media in various locations. No longer can we rely on only lectures for teaching. On-line courses, CD-ROMs, videos, modules, etc. will be used in the future. The student of the future may no longer need to be on-site to participate. Offering these types of courses to international and other students will be a future goal for NUPOC. It may be difficult to simulate all educational experiences through these methods, but changes are already beginning to take place.

Multiple levels of education may surface in the future. Cost containment, managed care, and the health care marketplace have thrust upon our profession the need for different levels of training. Certified practitioners have the education and training to provide comprehensive orthotics and prosthetics care. However, is a certified practitioner truly needed to provide a soft corset or prosthetic shrinker sock? Standards have been developed by the National Commission on Orthotics and Prosthetics for three levels of training. These levels are classified as Practitioner, Associate, and Technician. In the future, the number of practitioners may decrease, as cost containment makes it necessary to hire more associates.

However, with the development of new technology it may force the profession to educate practitioners at an even higher level. Education and training at a Masters of Science or Doctorate level may be needed. NUPOC is studying these changes in educational levels in its strategic planning process.

The future brings many questions for the educational process in prosthetics and orthotics. Some are being answered now, while others are still not quite clear. NUPOC is poised to be proactive in the educational arena, to bring about change and innovations in teaching, and lead students into the new millennium with confidence.❖

The VA Presents

News from the Department of Veterans Affairs

Federal Benefits for Veterans

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

The Department of Veterans Affairs (VA) Prosthetic and Sensory Aids Service Strategic Healthcare Group administers various veteran benefits or assistance programs through its medical facilities located throughout the United States.

The Home Improvement and Structural Alteration (HISA) program helps pay for home improvements necessary to ensure the continuation of medical treatment or provide access to the home and essential lavatory and sanitary facilities. VA will pay a lifetime benefit up to $4,100.00 for home alterations for a veteran being treated for a service-connected disability; and a lifetime benefit up to $2,100.00 may be paid for other veterans.

Improvements and structural alterations chargeable against the veterans' cost limitations include, but are not limited to: Roll-in showers; construction of wooden or concrete permanent ramping to gain access to the home; widening of doorways to achieve wheelchair access; lowering of kitchen or bathroom counters and sinks; improving entrance paths and driveways in immediate area of the home to facilitate access to the home; construction of concrete pads and installation of electrical wiring when necessary for installation of exterior types of wheelchair lift mechanisms, if installation costs are over $500.00; interior and exterior railing deemed necessary for patients with ambulatory capability or for veterans rated legally blind, if installation costs are over $500.00; and improvements in plumbing or electrical systems made necessary due to installation of dialysis equipment in the home.

Automobile Adaptive Equipment program: Veterans and service-members qualify for this benefit if they have service-connected loss of, or permanent loss of use of, one or both hands or feet, or permanent impairment of vision of both eyes. Veterans entitled to compensation for ankylosis (immobility) of one or both knees, or one or both hips, also qualify for adaptive equipment for an automobile. There is a onetime payment by VA of not more than $8,000.00 toward the purchase of an automobile or other conveyance. VA will pay for adaptive equipment, and for repair, replacement, or reinstallation required because of disability, and for the safe operation of a vehicle purchased with VA assistance.

Every consideration is given to safety

While the purpose of the automobile adaptive equipment program is to provide the necessary equipment to enable a disabled veteran to operate a motor vehicle, the primary concern is the safety of the veteran and other people on our Nation's highways. To accomplish the purpose of the program, there is a combined effort by the involved physicians, driver trainer instructors, and prosthetic representatives. Each applicant will be given every consideration in determining the individual's ability to operate a motor vehicle. However, operational items of adaptive equipment may not be authorized, even if the veteran has a valid driver's license, if it is medically determined that the veteran does not have the physical ability to operate a motor vehicle safely.

Other items, such as van lifts, raised doors, raised roofs, and wheelchair tiedowns for passenger use, may be furnished as part of medical services for all veterans as a follow-up to VA hospitalization or treatment provided the equipment is medically necessary for the care and treatment of the veteran. They may not be provided for the comfort or convenience of the veteran to make life outside

the hospital more available or if the veteran retains the ability to transfer and store his or her wheelchair.

***Clothing Allowance Benefit**:* Any veteran who is entitled to receive compensation for a service-connected disability for which he or she uses prosthetic or orthopedic appliances which tends to wear out or tear the clothing of such veterans, may receive an annual monetary clothing allowance. The allowance also is available to any veteran whose service-connected skin condition requires prescribed medication that damages the veteran's outer garments.

To hear more about any of these programs, contact your local VA Medical Center, Prosthetic and Sensory Aids Service. ❖

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

Tim Nugent wins the Betts Award for 1999

By Jan Little

Tim Nugent is a part of the lives of many people who have been active successful in professions including medicine, law, journalism, education and business even though we use a wheelchair or prostheses or have sight or hearing impairments. Tim, winner of the 1999 Henry B. Betts Laureate, became an advocate in the mid-1940s. In the past 50 years, he has had a hand in many changes that have made it possible for those of us with disabilities to gain educations and enter the mainstream of our communities.

Tim is one of the most stubborn men I ever met. He was determined to prove that he could do something everyone told him was impossible – provide the opportunity for people who were "confined" to wheelchairs to attend college. A graduate of the University of Wisconsin at La Crosse who was intending to earn his doctorate degree, Tim set forth to prove his theory with real people. He found a division of the University of Illinois housed in a former hospital at Galesburg, Illinois where "his kids" could attend college. The experiment worked well. Then the University of Illinois closed the Galesburg division. The University officials questioned whether Tim's wheelchair users could function on the Urbana main campus.

This all occurred in 1948-50. When I arrived at the University of Illinois in 1957, Tim was still badgering the administration each fall and raising enough ruckus that the University officials always relented and let Tim's program add more and more people with disabilities.

Tim's students liked sports. Soon the National Wheelchair Basketball Association grew from a couple of teams to multiple conferences until today there are hundreds of teams in the U.S. For years, the Illini wheelchair athletes dominated not only basketball, but track and field, swimming, archery and the other sports. Few USA Wheelchair Teams travelled overseas without a majority of Illinois athletes.

The American National Standards Institute (ANSI) Standards for Accessibility, had their beginnings in Urbana, Illinois. Tim and his staff built a ramp from used lumber. The pitch could be adjusted so us students could push up the ramp until it was determined that 1 to 12 rise was about as steep as practicality allowed. Funding from the Easter Seal Association helped finance the development of the standards. Architects and engineers from across the nation joined in the effort. ANSI A-117 was put into Code in 1961 and still is the basis for architectural accessibility incorporated into federal and state building codes.

The University of Illinois campus is big. It's also cold, snowy and wet at times. To enable students in wheelchairs to get to class, Tim and his staff set to work to put a fleet of lift equipped buses on campus. As often in other situations, Tim was able to convince others to become totally involved in his mission. He found the owner of a company with the national maintenance contract for the Greyhound Bus company. Not only did the company owner talk a supplier of lifts for freight trucks to come up with a lift for a bus, he talked Greyhound into giving used buses to the U of I program.

Today, people with disabilities may take for granted the fact that public buildings have level entrances with automatic doors; that public restrooms have large stalls equipped with grab bars and raised toilets. These same people are still waiting for over-the-road bus systems to be accessible, but most major city bus systems use the grandchildren of those first lifts to be used on the U of I campus. But, as much as some may gripe, they'd be surprised how hard life for those of us with disabilities was before Tim Nugent decided to prove he was right. Thanks, Tim. ❖

The Henry B. Betts Laureate was created to honor Dr. Betts, who served as CEO and Medical Director of the Rehabilitation Institute of Chicago for over 30 years.

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