Capabilities

Communicating the Science of Prosthetics and Orthotics

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Funding from the Department of Veterans Affairs resulted in state-of-the-art facility for Northwestern University Prosthetics Research Laboratory

Researchers at the Northwestern University Prosthetics Research Laboratory and Rehabilitation Engineering Research Program (NUPRL& RERP) have a long history of investigating human movement in their effort to better understand the requirements for improved prosthetic design. Much of their progress was achieved with the Human Mechanics Measurement Laboratory (HMML) that was equipped with two AMTI force platforms and two first-generation CODA 3 Motion Measurement Systems. In its last years, the system was able to track only three markers on the body at a time, requiring the research staff to design creative experimental protocols that limited ambulation studies to either whole-body movements or to the motion of very specific body segments.

Even with these restrictions, researchers were able to gain insights into normal walking, and to characterize and evaluate the function of various lower-extremity prosthetic components during amputee gait. This information resulted in the initiation of several new research projects, and in the design of a new prosthetic foot. Although a great deal was learned about ambulation, the instrumentation was limited and a system with greater capacity was needed.

HMML was retired and replaced by new technology

Last year NU retired the Human Mechanics Measurement Laboratory because the motion measurement system was outdated and could no longer meet the needs of the researchers. With generous funding from the Department of Veterans Affairs, HMML was replaced with the VA Chicago Motion Analysis Research Laboratory (VACMARL). VACMARL is a state-of-the-art research laboratory designed especially for making the measurements necessary for evaluating, characterizing, and studying human movements. Renovations to the laboratory were completed this past summer, and VACMARL is nearly ready to begin collecting data for a backlog of planned experiments.

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VACMARL: New Research Potential

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At the heart of VACMARL is a six-camera, 60/120/240Hz switch-selectable Motion Analysis Corporation (MAC) motion measurement system that is used to measure walking kinematics. VACMARL has the capacity to track a virtually unlimited number of markers, reflective balls placed on the body at specific anatomical locations where bones are prominent, such as the ankle, heel, knee, sacrum, and shoulder. The locations of the markers, held on the body with double faced tape, help to define the particular biomechanical model that is used to analyze the data.

The VACMARL facilitates the rapid processing of data and generation of graphs for further analysis.

As the subject walks across the walkway, the positions of the reflective balls are recorded by the motion analysis cameras that are placed on the periphery of the room. From this data, VACMARL calculates the centers of rotation of the joints and the joint angles, thus defining the positions of the limb segments in space. Using OrthoTrak software (Motion Analysis Corp.), VACMARL researchers can rapidly process the data and generate graphs for further analysis. VACMARL also has KinTrak software (Motion Analysis Corp.) for creating more advanced biomechanical models of walking and for conducting analyses of upper-extremity movements.

Six force platforms expand potential measurement

VACMARL has six AMTI force platforms embedded in the walkway for measuring ground reaction forces as subjects walk across them. This data indicates the magnitude and direction of forces exerted by the subjects on the floor during the different times of the gait cycle, and tend to be characteristic for different types of gait. The ground reaction force data can be used with the kinematic data to calculate joint moments, which is a measure of the tendency for rotation to occur about a joint. The laboratory also has a Noraxon 8-channel telemetered EMG system for measuring muscle activation during human movements. Surface electrodes are placed on muscle groups to determine the times that muscles are active for the particular movement under study. Finally, VACMARL has a digital video subsystem consisting of two digital camcorders, a VCR, a monitor, and a video-editing board. The system will be used for recording split-screen displays of two simultaneous views of research subjects during experiments, and for editing video presentations.

VACMARL will be used to further understand normal human ambulation, and to study pathological gaits in an attempt to determine how improvements can be made to ambulation aids. One of the primary goals of VACMARL is to provide researchers, and ultimately clinicians, with more complete knowledge and a better understanding of the mechanical interactions that occur between humans and prosthetic/orthotic systems. This knowledge may contribute to improved fitting and manufacturing processes for these systems, and help individuals using these devices lead an improved quality of life.

Regina Konz, Manager of VACMARL, will oversee operation of the new motion analysis system, assist researchers with the planning and implementation of their experimental protocols, and coordinate the research efforts among the investigators. Having been instrumental in fine-tuning the system and working through numerous issues concerned with getting the new motion analysis laboratory up and running, Ms. Konz has an in-depth knowledge of the capabilities of the laboratory.

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Everyone is About Ten Feet Tall ...on a Horse

The sun is just appearing over the wooded hills around Dundee, Illinois as the quarter horse gelding gallops along a path. The horse's coat glistens in the sun — as does the long blonde hair of his rider.

Genuine Prince and Meggan Hill are enjoying a little relaxation before they both have to go to work. For Meggan, General Manager of Kickapoo Farms, the day may include revising the diet of one horse and working with another to get him into peak condition for a show. She'll probably spend some time reviewing the stud books and doing preliminary planning for the following year's breeding of mares to assure top quality cutting horse foals. Of course, she'll check all the horses to see that they're healthy and fit. Some of her favorite moments include foaling time — welcoming new babies, assisting mares and imprinting upon birth, a unique natural training method.

But maybe the best part of the day will be when some of the horses and Meggan work together with the Cowboy Dreams of Illinois program. This program is a horseback riding program for children with special needs. The official title for this form of therapy is Hippotherapy/Therapeutic Horseback Riding. Cowboy Dreams is one of the many programs across the nation that form the NARHA (North American Riding for the Handicapped Association) founded in 1969 to promote therapeutic riding in the United States and Canada.

(Above) Meggan gets a kiss from a friend. (Upper left) Meggan, far right, helps a child experience Cowboy Dreams, and (lower left) trains a young quarter horse.

Cassie* doesn't particularly care that Hippotherapy means the horse is part of her medical treatment or therapy that helps her improve her posture and balance, enhance her motor skills and gain strength in muscles. Cassie doesn't care much about the fact that riding has encouraged her to talk and smile more and be more involved with her surroundings. She just thinks about how pretty the mane on her horse is, how big and warm he feels when she's on his back — making a horse go around the arena — and how much she loves it when he nuzzles her with his soft, silky nose.

Meggan Hill and her colleagues who conduct Cowboy Dreams for children with Sensory Issues, Cerebral Palsy, Down Syndrome and other developmental disabilities are opening a new world to these children. Some therapists feel that the roll of a horse's gait is identical to what the child would experience in walking and that the exercise encourages development of muscle, hip and pelvis strength, and mobility that may be critical in learning to walk. Sitting on top of a horse also gives a child a perception of the world that's much different than what he or she sees sitting in a wheelchair.

Perhaps an effect of these riding programs equally important to the physical therapy is the interaction children have with their horse. One child with Down Syndrome signed the word for horse after his first riding lesson and, after his third lesson, he then took his first steps ever. This is the type of case that gives goose bumps to Meggan as she witnesses amazing progress for the child.

The benefits Cowboy Dreams riders gain from horses please Meggan Hill. The program combines two of her personal goals: getting the best from a horse and making a child's life better.

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NU Study is Examining What Factors Contribute to the Effectiveness of Prosthetic Components

Measuring outcome of treatment of people with amputations becomes more critical each month. Outcomes of the application of specific components in a prosthetic system can be a basis for making decisions that have both personal and economic impact on the lives of the thousands of people with amputations who annually receive prosthetic services.

Outcomes of prosthetic and orthotic fittings critical

From a practical, personal aspect, pain or less than optimal function is reported by many people to the Northwestern University Help Line and other resources including the Amputee Coalition of America. From an economic aspect, funding agencies including state and federal programs and private insurance want assurance that various components are worth the costs and provide satisfactory solutions. For example, an insurance company may balk at paying for an electric hand, arguing that a simpler prosthesis is just as effective. As research produces prosthetic innovations such as dynamic feet, computer controlled knees, and advanced electronic control systems, it becomes more critical to make standard outcome measurements of the effectiveness of these products available to both those who prescribe and those who pay.

A project now underway at Northwestern University Rehabilitation Engineering Research Program is developing a prototype database. The database will describe wearer characteristics, device characteristics, outcomes, and costs. The goal of the database is to help prosthetic and orthotic providers document and evaluate the benefits of their services and help them improve user outcome. In addition, disseminating the database to service providers across the nation will provide a uniform language to compare device utilization, program outcome and costs.

The goal of the project is to develop a prototype data base that includes a set of measures that are uniform across service delivery sites and useful across the continuum of care from acute care to rehabilitation to follow up. In developing the database, the project will create data-gathering processes to address categories pertinent to selecting orthotic and prosthetic components.

Categories to be Addressed in the Study

1. Demographic characteristics
2. Impairment characteristics that define severity of injury.
3. Disability data that are used to monitor improvement.
4. Societal participation information that is used to plan follow up and enhance quality of life.
5. Quality and durability of the prosthetic and orthotic devices.
6. Cost of and patient satisfaction with prosthetic and orthotic services.

Although there are some outcome measurements used to evaluate overall rehabilitation services, none currently address the specialized and complex combination of functional, pyschosocial and medical challenges encountered by people who experience amputations. Given that older adults comprise a large portion of prosthetic and orthotic service recipients, that group will be given special consideration.

The project is being conducted in three phases.

Phase One will develop instruments to measure impairment, disability, societal participation, and service satisfaction. The first three categories are based on the model of disablement developed by the World Health Organization. This model sets forth four realms of disablement: 1) underlying diagnosis, or *disease*; 2) loss or abnormality of physical or psychosocial capabilities or *impairment*; 3) restriction in activities of daily living, or *disability* and 4) social disadvantage due to limited ability in fulfilling a role that is normal for that person, or *societal participation*.

During this First Phase, information on the impairment, activity and participation of people with amputations was collected from the existing literature. A task force of clinicians collaborated to provide this information. Mem-

bers of this task force include Yeongchi Wu, MD, physiatrist and amputation consultant; Jamie Helan, OTR, occupational therapist specializing in rehabilitation of amputees; Mark Edwards, CP, Director of Prosthetic Education at Northwestern University; Todd Kuiken, MD, amputation expert at the Rehabilitation Institute of Chicago; Craig Heckathorne, MS, research staff member of NUPRL&RERP and Jack Uellendahl, CPO, Director of Prosthetic and Orthotic Services at the Rehabilitation Institute of Chicago.

Phase Two of the project, currently underway, consists of evaluation of the developed instruments including their reliability, validity and sensitivity. Phase Three will be data base prototype development and monitoring of patients' impairments, disability, handicap and service satisfaction over time. Benefits of prosthetic and orthotic services will also be conducted.

The outcome measures will be integrated into a prototype data base with anthropometric, device and cost characteristics. Initial evaluation will be at the RIC Prosthetic and Orthotic Services in Chicago and Blue Island, Illinois. The prototype data base will then be disseminated for evaluation at pilot sites across the country. The project is headed by Allen W. Heinemann, PhD. Dr.

If you are interested in providing a pilot site for evaluation of the prototype data base, please contact:

Allen W. Heinemann, PhD
Director, Rehabilitation Services Evaluation Unit
Rehabilitation Institute of Chicago
345 E. Superior Street - Room 1374
Chicago, IL 60611-4496

Heinemann has extensive experience in evaluation of rehabilitation services as the director of Rehabilitation Services Evaluation Unit at the Rehabilitation Institute of Chicago (RIC). He is also associate director of Research at RIC and a professor of Physical Medicine and Rehabilitation at Northwestern University and has an appointment in Northwestern University's Institute for Health Services Research and Policy Studies. ❖

Everyone is Ten Feet Tall on a Horse

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Meggan Hill's life has centered around horses since her Dad sat her on top of one of her Shetland ponies when she was three. It might have seemed that a career in training, handling and caring for horses was not a good choice for a woman who was born with a congenital below the elbow amputation. It didn't seem important to Meggan. She decided to make her passion for horses her career. She says even the degree in Psychology she earned from the University of San Diego has been part of her career preparation in that it has helped her understand horses more thoroughly.

Not one to lead a sheltered life, she worked as a Wrangler at Eaton's Ranch, a large, well-known dude ranch in Wolf, Wyoming. She also trained horses and managed stables in New Mexico, then became partner and General Manager of The Ranch at Berry Creek in Edwards, Colorado. It was here that she started with her first Cowboy Dreams program. She had met a Physical Therapist who requested Meggan's help with teaching a three year old boy with Down Syndrome to ride a horse.

Meggan was hooked from the moment she saw what she could offer to children with disabilities. When she relocated to her native Illinois to assume the management of Kickapoo Farms, she was missing the hands-on contact involved in teaching children with disabilities to ride. Farm owner, Susan Graunke, who helped start Cowboy Dreams in Edwards, Colorado, encouraged Meggan to start a program in Chicago's northwestern suburbs. Staying active as a member of the Board of Directors in Colorado for the original Cowboy Dreams has been important to Meggan as well.

Meggan has participated in all phases of riding and horses. She currently uses a manual lower arm prosthesis because she feels it is stronger than a myoelectric hand and holds up better under the stress of handling horses and doing rugged farm work. She is considering trying a myoelectric hand, though. She refuses to be left behind as technology advances rapidly in this field.

When asked what result she would like most to see from an article in Capabilities, she replied, "I'd like to see support for Cowboy Dreams". Readers may learn more about Cowboy Dreams or contribute to the program by contacting Meggan at Kickapoo Farms, Cowboy Dreams, 31 West 952 Penny Road, East Dundee, IL 60118 (phone - 847/844-9070) or Cowboy Dreams, P.O. Box 2097, Edwards, CO 81632. ❖

**Cassie is a composite of children who actually have participated in the therapeutic riding program in Dundee.*

Addition of a New Paradigm: The Special Study Module

Bryan Malas, C.O., C.Ped.
Director, Orthotic Education,
Instructor Physical Medicine & Rehabilitation
Northwestern University Medical School

A major problem faced by many educators in today's academic arena is content overload in curriculum. The constant flow of new and relevant information each day has left the educator with the daunting task of integrating new information into an already overloaded curriculum. The orthotics certificate program at Northwestern University recently implemented the Special Study Module in an effort to remedy these issues and address the needs of the students.

The special study module (SSM) provides the educator with an avenue to develop greater in-depth study without a change in core curriculum. The greater in-depth study, as a component of this paradigm, is a method that also enhances student's ability to practice critical thinking and reasoning. To evaluate the SSM method, we initiated an SSM for Spinal Orthotics in the program's curriculum this semester.

The SSM provided three days of intensive study

Upon completion of the core curriculum in spinal orthotics this semester, students attended a three-day SSM in Spinal Orthotics. The format of the module consisted of didactic lectures in the morning sessions and case-based/ problem-based learning in the afternoon sessions. The entire module was preceded with advanced readings for students in an effort to better facilitate the learning experience.

Content selection was based on past program evaluations, practitioner questionnaires, and a faculty focus group, which included adjunct faculty. As a result the following items were selected as course content for the module: scoliosis, kyphosis, fracture management, and low back pain. Summative and formative evaluation of the module's effectiveness is based on pre- and post-test examinations, program observation, student program evaluations, and faculty focus groups. This will provide information that is not only important for determining program effectiveness but any future change that may be deemed necessary.

Case-based problem solving is enhanced by SSMs

One of the most exciting aspects of the SSM in Spinal Orthotics for faculty members was the student ability to problem solve during the case-based learning sessions. Cases consisted of differential diagnosis and the student's ability to recommend appropriate orthotic intervention based on diagnosis. Students were divided into subgroups for break-out sessions to review cases. Students then presented their findings to the faculty and were critiqued on their ability to defend and justify their responses. The performance outcome was judged favorable by all members of the faculty.

The fact that student responses were deemed favorable during case presentations allows for cautious optimism about the effectiveness of the module. Preliminary observation of the student's evaluation of the module also appears to support this optimism. It is the hope of the faculty that further investigation of the SSM will provide positive results about the effectiveness of the program and identify those areas in need of refinement. If student's ability to critically think and solve problems can be improved with this method of learning, the possibility of including more special study modules may be a realty in the not-too-distant future.

Special thanks to Avinash Patwardhan and Tom Gavin for their dedication to NUPOC and our students.

VACMARL: New Research Potential

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Steven Gard, PhD, Director of VACMARL, will use it to study below-knee amputees walking with vertical shock-absorbing pylons, which are a class of prosthetic components that are specially designed to reduce shock forces in the prosthesis during gait. For the experiments, subjects will walk on their regular prostheses without vertical shock pylons. Afterward, a vertical shock pylon will be added to their prosthesis and another gait analysis will be performed. Data will be analyzed to determine how the addition of shock absorption affects the amputees' gait. Results from this work may lead to an improved design for a prosthetic shock-absorbing mechanism.

Steve Miff, who is working on his Master's degree in Biomedical Engineering at Northwestern, will use the VACMARL to characterize the relationship of cadence, step length and walking speed to other walking parameters. A person's walking speed is determined by both cadence—the stepping rate—and step length. Miff plans to conduct gait experiments in which the research subjects will walk at several particular speeds with controlled cadences, but with freely-selected step lengths. He will then control their step length at those same speeds and allow the subjects to pick their own cadence. By analyzing the effect of step length and cadence on several key gait parameters, researchers hope to establish why subjects choose the gait parameters they do.

(Above right) VACMARL Manager, Regina Konz, performs a "wand calibration" prior to a data acquisition session, then (above) places reflective markers on Steve Miff. As Steve walks on the force plates (right), data is acquired.

Brian Ruhe, also working on his Master's degree in Biomedical Engineering at Northwestern University, will use VACMARL to examine gait characteristics of able-bodied individuals with constrained joints. Results from this work may lead to more functional prosthetic components, improved understanding about shock absorbing mechanisms and possibly revise gait training techniques that could enable amputees to walk more efficiently and with improved aesthetics.

Andy Hansen, M.S., a Ph.D. student at NU, will use VACMARL to determine the roll-over shapes of physiological feet during normal walking and of prosthetic feet during amputee gait. By using center of pressure data derived from the ground reaction with the shank movement information, Andy can calculate the roll-over shape of the foot. Results from this work may enable *a priori* alignment of prosthetic foot roll-over shapes by using able-bodied foot roll-over shapes as a guide.

Craig Heckathorne, M.S., Research Engineer for NUPRL & RERP, will use VACMARL for documentation, verification, and evaluation of upper-limb prostheses.

The effect of trans-humeral prosthesis design on the ability of a person to reach in front of, to the side of and above his or her body with that prosthesis is being investigated. Clinical observations suggest that choice of prosthetic components, socket design, and suspension system all influence the range of reach available to the prosthesis user. Component weight and the distribution of that weight within the prosthesis may have the greatest influence on the range of reach. VACMARL will facilitate investigation and documentation of the influence of weight and weight distribution in upper-extremity prostheses in

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Childress and Gard Present at ISB

Calgary, Canada was the site of the XVIIth Congress of the International Society of Biomechanics (ISB), August 8 through 13th. Dudley S. Childress and Steven A. Gard presented a paper titled “Vertical Movement of the Trunk in Human Walking”.

Regina Konz joins PRL Staff as Manager of New Motion Laboratory

Regina Konz will oversee operation of the new Veterans Administration Chicago Motion Analysis Research Laboratory (VACMARL). Ms Konz will assist researchers with the planning and implementation of their experimental protocols and will coordinate the research efforts among the investigators. Having been instrumental in fine-tuning the system and working through numerous issues concerned with getting the new motion analysis laboratory up and running, Ms. Konz has an in-depth knowledge of the capabilities of the laboratory. She received her Master’s degree in Mechanical Engineering from the University of Iowa in 1998. Prior to coming to VACMARL, she was the Laboratory Manager of the Gait Research Laboratory at the Rush-Presbyterian-St. Luke’s Medical Center in Chicago.

NUPOC Faculty Travels Widely with Presentations

Mark Edwards and Bryan Malas spent the time between NUPOC courses in prosthetics and orthotics sharing their knowledge with others. On August 27-28, Mark Edwards presented at the North and South Carolina Chapter of AAOP meeting in Wilmington, NC. Topics presented were "An Overview of the Removable Rigid Dressing Techniques” and “Parameters for Ischial Containment Socket Shapes”. Bryan Malas gave a lecture to the Alabama O&P society, August 7th on “Biomechanics, Pathomechanics, and Evaluation of the Foot and Ankle” in Orange Beach, Alabama

On October 27-31 Mark Edwards and Bryan Malas will travel to Iceland to present "Overview of Prosthetics and Orthotics for Suppliers and Manufacturers" to the company OSSUR.

NUPOC Strategic Planning Reviews Content and Presentation

The September 23-24 NUPOC Strategic Planning Meeting was an opportunity for all participants to discuss effectiveness of instructional methods and set forth program goals and objectives for the next five years. Topics involved preparation for certification in orthotics and prosthetics, continuing education for physicians, therapists and manufacturers and special topics such as pedorthics and pediatric orthotics. Participants were NUPOC faculty, the research staffs of NUPRL and NURERP and practitioners from the Chicago community. The strategic planning meeting was led by Dr. Mark Golula, Assistant Professor of Medical Education, University of Illinois at Chicago.

Michel Sam Joins the NURERP Research Staff

Michel Sam, MS, ME, has joined our staff as a Research Engineer. He recently received the Masters of Science degree in Mechanical Engineering from the U of California at San Diego, with emphasis in biomechanics. Mr. Sam has a BS degree in Mechanical Engineering from the U of California at Berkeley. At San Diego, he worked in the laboratory of Dr. Richard L. Lieber. Michel is working on development of artificial feet, evaluation of the mechanical characteristics of feet, failure analysis, and fatigue testing.

VACMARL: New Research Potential

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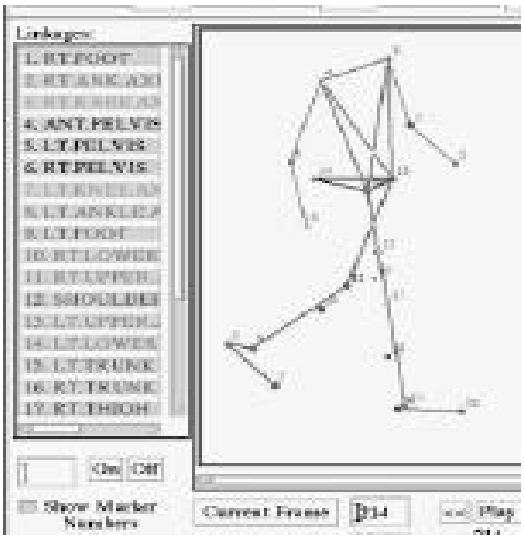
the angles and distances test subjects can reach from their body when fitted with different components.

The second upper-limb prosthetics research project, the Prosthetic Arm Design and Simulation System (PADSS) is a computer-based tool under development at the RERP.



Using a graphical interface, PADSS enables a prosthetist or researcher to design an arm prosthesis from existing or hypothetical components and evaluate certain features of that design without having to physically implement it. The prosthesis is combined with a human figure developed from standard anthropometric data or from measurements of a specific individual. At present, the PADSS provides a map of the volume of space, termed the "workspace", within which the prosthesis can be positioned and a "contact map" of points on the human figure that can be touched by the prosthetic prehension device. This contact map can be used, along with other factors, to compare the appropriateness of one prosthesis design over another before proceeding to actually building the prosthesis. To verify the accuracy of these predictions, Heckathorne plans to model existing prosthesis users and their prostheses with the PADSS, calculate the workspace and contact map, then compare the calculated predictions to where the person can actually reach with his or her prosthesis. VACMARL would be used to determine the actual volume of space within which the user can position the prosthesis and the motion analysis records, processed using the KinTrak software package, can produce a three-dimensional reach volume and surface contact map.

In a study conducted several years ago, NU researchers evaluated the role of the non-dominant hand in several activities of daily living carried out by persons with intact limbs. They were interested in determining to what extent the non-dominant hand was recruited for grasping activities and what patterns of grasp were utilized. The subjects' actions were evaluated using two synchronized video records, a front view and an overhead view. Although the results were of value, analysis of the video records was extremely time-consuming, which prevented conducting similar human performance evaluations.

(Above) One of the six 60/120/240 Hz switch-selection cameras. The red LED strobe encircling the lens shines light on the reflective markers which are placed on the subject and enables the camera to see thrm better. (Left) The data acquisition program, EVa, creates a stick figure from the marker set which can be used to step through the data frame by frame.

Heckathorne feels that by automating the recording of limb position and movement analysis, VACMARL should greatly improve the efficiency of studies involving upper-limb function. This is significant because actions performed with the upper limbs typically lack the cyclic characteristic of lower-limb function. Consequently, evaluations of upper-limb function generally require longer periods of recording and a greater diversity of activities. Use of the motion analysis system makes it more feasible to undertake studies comparing activities performed by persons with intact limbs and the same activities performed by persons using arm prostheses. It is also more feasible to evaluate differences in performance that occur with a change in prosthetic componentry or control method.

VACMARL is a powerful resource that will permit NUPRL&RERP researchers to study human movement much more intensely than was previously possible in the laboratory. With the increased capacity for acquiring and analyzing data, VACMARL provides the possibility for comprehensive human performance characterizations and evaluations, and it will facilitate the development of sophisticated biomechanical models. VACMARL has the potential to provide key information that could increase understanding of human movement biomechanics, and that may eventually lead to the development of improved upper- and lower-extremity prosthetic and orthotic devices. ❖

The VA Presents

News from the Department of Veterans Affairs

The National Prosthetic Patient Database

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

The National Prosthetic Patient Database (NPPD), poised to be one of the most powerful, important management and clinical tools for the Veterans Health Administration (VHA), is a roll-up of all prosthetic data recorded at each VA facility. The NPPD is based upon a standard national nomenclature and coding system - Health Care Financing Administration (HCFA) Common Procedures Coding System (HCPCS).

Software package can compile many types of information

While the NPPD has been in use and continued development for only a couple of years now, it has been providing VA medical facilities the data needed in order to monitor their prescription, procurement, and costing information in order to identify any best practices or areas for improvement. The NPPD is linked to the software package Prosthetic Service personnel use to purchase or issue equipment, supplies, or services for individual patients. Therefore, the database is capable of compiling patient demographics, prescription, vendor, cost, procurement, and time frame information on both a national and local level.

Frederick Downs, Jr., Chief Consultant, Prosthetic and Sensory Aids Service Strategic Healthcare Group, VHA Headquarters, briefed top VA officials on how the information will be used to increase quality, reduce costs, and improve efficiency. This has already been the case in many Veterans Integrated Service Networks (VISNs) as they use the database as a tool to develop consistency in providing service. "It is important to point out the NPPD is a patient database to be used for clinical reviews and not for standardization" says Downs. For instance, the NPPD will show a variety of (Transcutaneous Electronic Nerve Stimulation) TENS Units are prescribed in large quantities, but there is no consistency of outcome from facility to facility. If a decision would be made by a VISN to standardize TENS Units based upon highest use instead of first conducting a clinical review of prescription criteria and patient outcomes to determine which TENS Unit provided the best quality care, that VISN would be letting the standardization process drive the prescription process. "We must guard against this happening" continued Downs. Furthermore, current VA policy exempts Prosthetic Services from other policies to standardize.

The NPPD's power enables one to quickly and easily conduct a logistical analysis on every prosthetic appliance recorded in the Prosthetic and Sensory Aids Service nationwide. Comparative analysis in order to review prescription practices and costs system-wide and with the private sector for like or same items, is one of the biggest cost savings opportunities for VHA.

Medicare has used some data to set reimbursements

While VA has been a leader in securing high quality items/services at reduced prices for years and even more now with the NPPD, Medicare has reduced some of their reimbursement ceilings due to VA data and practices – avoiding additional Government costs even more.

Prosthetic Program officials in VHA Headquarters along with prosthetics staff at each facility review the data for validation on a continuing basis. In fact, coding errors have been reduced significantly since database figures have been released to field facilities via the VA Intranet, and each VA facility is given a copy of the cumulative Microsoft Access-based database on a quarterly basis.❖

Another example of VA's commitment to quality and commitment to being "One-VA".

Current Issues/Initiatives: VHA and VBA officials are currently discussing the possible transfer of responsibility of the Clothing Allowance and Automobile Adaptive Equipment Programs from VBA to VHA. These benefits may soon be exclusively handled by VA medical facilities where patients receive their care instead of the VA's Regional Office system. Stay tuned for future updates.

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.

Prosthetics Primer by A. Bennett Wilson, Jr. is Available

A Primer on Limb Prosthetics, By A. Bennett Wilson, Jr., Published by Charles C. Thomas, Springfield, IL. Price $38.95 (cloth bound), $25.95 (paper bound).

This book is written as a source of information on prosthetics for entry-level prosthetists, physical therapists, Physiatrist, orthopaedic surgeons and others who may be involved in supplying prosthetic devices.

Mr. Wilson, who most recently was Associate Professor, Department of Orthopaedic Surgery and Rehabilitation at the Medical School of the University of Virginia, is a pioneer in the prosthetics field. For many years, he was director of the Committee for Prosthetic Research and Development (CPRD) of the National Research Council , an organization that spurred development of research and education in prosthetics, orthotics, and assistive technology at the national level. ❖

ACA Web Site Helps People with Amputations Find Resources

The Amputee Coalition of America (ACA) Web Site is a resource that well illustrates the benefits the Internet has brought to people with disabilities, including those with amputations. The ACA site, www.amputee-coalition.org/, is a critical component of the National Limb Loss Information Center (NLLIC). Like most web sites, the ACA/NLLIC page is a work in progress. At this time, visitors to the site can learn about ACA's mission, meetings, Board of Directors and educational resources. A complete archive of the In Motion Magazine allows visitors to select topics of interest.

A recently added feature of the ACA/NLLIC site is the Search Page. Using this feature, the visitor has access to a search engine which finds selected information about specific topics, such as "cosmetic hand prostheses", or "funding issues". Site visitors may also register for support groups in various parts of the nation.

Other web sites which people with amputations may find helpful are:

Justice For All E-Mail Network (www.jfanow.org), which issues reports and alerts on Congressional legislative activity.

Worldwide Virtual Community of the Disabled (www.linkable.org), which provides links to web sites by disability categories.

And, of course, Northwestern University's Prosthetic and Orthotic research site, www. repoc.nwu.edu/ ❖

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- ❒ Send me a copy of the latest *Activity Report*.
- ❒ Start my subscription to *Capabilities.*
- ❒ Send me one copy of *P&O Resource Directory.*
- ❒ ADA List of Publications
- ❒ Amputee Support Groups
- ❒ Association. of Children's Prosthetic-Orthotic Clinics List
- ❒ Video List

Bibliographies of NUPRL&RERP Publications Available on the Following Topics:

- ❒ Above Knee Prosthetics
- ❒ Ambulation, Gait & Posture
- ❒ Biomaterials
- ❒ Below Knee Prosthetics
- ❒ Computer Aided Engineering/Design/Manufacturing
- ❒ Pediatric Prosthetics
- ❒ Prosthetic Feet
- ❒ Prosthetics & Orthotics: General
- ❒ Upper Limb Prosthetics & Orthotics

Other Sources for Prosthetic & Orthotic Information:

Consumer Information:
National Limb Loss Information Center
900 East Hill Avenue - Suite 285
Knoxville, TN 37915
Toll Free: (888)AMP-KNOW

Prosthetic-Orthotic Education:
National Association of Prosthetic & Orthotic Education
1650 King Street - Suite 500
Alexandria, VA 22314
e-mail: opncope@aol.com

General Information about Prosthetics & Orthotics:
American Orthotic & Prosthetic Association
1650 King Street - Suite 500
Alexandria, VA 22314

Name_____

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