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Capabilities

Communicating the Science of Prosthetics and Orthotics

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Spreading the Word: Promoting Clinically-Relevant Knowledge in P&O

R.J. Garrick, PhD

The Northwestern University Rehabilitation Engineering Research Center (NURERC) for Prosthetics and Orthotics (P&O) presented a day-long State of the Science Meeting in P&O on October 13, 2012. The symposium examined Knowledge Translation (KT) in P&O. Stakeholders included educators, researchers, clinicians, manufacturers, and P&O consumers who collaborated to identify challenges and solutions to the delivery and effective integration of KT in P&O. This symposium was funded by the National Institute on Disability and Rehabilitation Research (NIDRR), US Department of Education (Grant Number H133E080009) and does not represent the opinions of the US Department of Education.

Part of the NURERC mission is to train P&O professionals and to increase the understanding of the scientific and engineering principles that pertain to human locomotion, reaching, grasping, and manipulation, and to incorporate those principles into the design and fitting of P&O devices. In short, NURERC seeks to develop and improve the fit and fabrication of P&O devices and to help humans enjoy full, functional lives. Dissemination of new P&O knowledge developed through NURERC research and the application of this new knowledge into P&O clinical practice serves to advance the discipline and professionalism of P&O.

The 2012 SOS Meeting examined from multiple perspectives the needs, methods, programs, and technological platforms that can effectively achieve KT in P&O. **Steven A. Gard, PhD** (NUPOC), opened the symposium with a summary of the 7 research and 5 development projects currently underway at NURERC. **Stefania Fatone, PhD, BPO(Hons)** (NUPOC), reviewed the results of the 2006 and 2012 pre-State of the Science meeting surveys. Responses to both surveys showed little difference between 2006 and 2012 responses about P&O research needs, foci, and opportunities. Clinicians expressed particular interest in outcomes that improve specific care and can justify reimbursement. Audience stakeholders concurred that the most desirable outcomes will yield a set of tools that can benefit both clinicians and researchers in the P&O profession.



Jennifer Flagg, MPH, MBA, discussed *KT across RERC Activities and Disseminating New Knowledge in P&O*

Jennifer Flagg, MPH, MBA (NIDRR DRRP, KT4TT, University at Buffalo, NY), spoke about *KT across RERC Activities*. NIDRR long term KT goals charge RERCs with improving quality of life for individuals with disabilities. Based on a Canadian model, RERCs generate a chain of KT activities: define problems, conduct research, and propose solutions. The KT process also translates knowledge into industrial production.

Recognizing that KT occurs within a complex, integrated system, the process of KT involves relevant stakeholders in collaborative relationships that shape KT design, implementation, dissemination, and assessment. Relationships and teamwork among expert stakeholders are essential to the KT process. RERCs identify and focus on the needs of knowledge users. Based on generalist principles, the KT team designs, tailors and implements dissemination strategies via multiple formats, platforms, channels, devices and communication tools. RERCs forge KT that can influence research, development, and the marketplace; and convert RERC findings into useful, applicable information for all stakeholders. Ms. Flagg also delivered the closing presentation, *Disseminating, Tracking and Evaluating New Knowledge in P&O*.



David Tiemeier, PhD, discussed *KT of Development Efforts in P&O*

David Tiemeier, PhD (Senior Director, NU-INVO), discussed *KT of Development Efforts in P&O*, Dr. Tiemeier noted, "NU-INVO has resources that can help P&O projects move through the trajectory from concept to market. Early market input and industrial relationships are essential to the process of identifying unmet needs and competitive landscapes that can affect the success of a device." A handful of companies who already sell products in a space can be invited to join pilot projects to help understand how to deliver a new device. Relationships with external networks also add

Continued on page 2

Continued from page 1

value by building prototypes and proofs of concept. Dr. Tiemeier spoke about intellectual property issues, "NU-INVO identifies patentable devices with the greatest market impact." NU-INVO encourages innovators to contact NU-INVO before disclosure to protect intellectual property and to avoid potential product-market collision.

NU-INVO offers portfolio management that promotes an innovation through horizontal and vertical integration. Horizontal integration is external to university resources, such as challenges to independent industrial relationships. Vertical integration operates within the university to promote innovative projects along a commercial trajectory to a "proceed or abort" decision. Dr. Tiemeier noted, "*This time-saving process identifies obstacles that can doom a project; and it saves researchers' time by demonstrating whether a project should proceed to industry or remain as academic research.*"

Denise Drane, PhD (NU, Searle Center for Teaching Excellence), presented *KT in P&O Education and Training*. She examined ways RERCs can create knowledge seekers by eradicating false dichotomies that may exist between research and practice, such as "research findings are irrelevant to clinicians" and "science is accessible only to other scientists". Citing Bloom's Taxonomy of Higher Learning, Dr. Drane noted, "*Environments that enhance KT and promote critical thinking among clinicians and researchers emphasize underlying reasoning for clinical approaches; evaluate strengths and weaknesses of different approaches; and reframe problems and solutions based on evidence.*" KT occurs through Communities of Practice that link researchers and clinicians at all levels, including undergraduate and graduate students, postdoctoral fellows, faculty, and peer facilitators. At the training and program levels, students are encouraged to identify as scientists, recognize research questions, design scientific studies, and develop a knowledge base that can solve scientific problems. Dr. Drane said, "Students who become knowledge seekers learn to generate and answer their own questions, make predictions, and evaluate evidence."

A panel discussion, *Need for KT in P&O*, featured the respective stakeholder views of **Tom Doherty**, (OttoBock, representing



Denise Drane, PhD, presented *KT in P&O Education and Training*.

manufacturers); **Jerry Harris**, PhD, (Marquette University, representing researchers); **Walter Afable**, CP, (Rehabilitation Institute of Chicago, representing clinicians); and **Chris Robinson**, CPO, MBA, ATC, FAAOP, (NUPOC, representing educators).

John Michael, CPO, MEd, FAAOP, FISPO, (NUPOC), addressed *Challenges to KT in P&O*. From his perspectives as clinician, educator, researcher, and businessman, Mr. Michael noted that KT is part of an equation that must also address the availability of commercial P&O solutions. CPOs are pragmatic clinicians who seek to integrate commercially available technology to reduce the impact of disability on individuals.

Reflecting on the thoughts of Charles Pritham (1994), Mr. Michael noted "*Research seeks knowledge that comes in slow, incremental steps that verify clinical experience. Thus, the results of research may be used to solve problems through feasibility studies and prototypes, rather than through immediate practical application.*" Product development synthesizes research and development into an affordable, useful and practical reality. Each stage must be rigorous to achieve results that improve a person's life.



John Michael, CPO, MEd, discussed *Challenges to KT in P&O*.

Knowledge Brokers who offer passive KT strategies, such as peer reviewed articles or web based summaries, can increase awareness of outcome measures, but will not likely boost practical application. To change behavior, P&O must promote active KT strategies, such as multi-platform interventions that improve evidence based knowledge and clinical practice. Suitable Knowledge Brokers in P&O are peer leaders who communicate their clinical experiences and who can tailor their reports to target specific audiences and P&O practice issues. Mr. Michael said, "*In P&O, strategic leaders already are in place and sustained discussions over multiple platforms can positively affect long-term clinical behavior. This will enable CPOs to integrate knowledge with products for the benefit of individuals who must live within real-world constraints.*"

In *Finding Solutions to KT in P&O* participants brainstormed in small groups and reported their proposals in full session. Small group discussion generated as many questions as suggestions. Some issues considered: How RERCs can direct and generate traffic to their website; the effort required to attract a web visitor; ways to ensure



(From right to left) Chris Robinson and Panelists Tom Doherty, Walter Afable, and Jerry Harris presented perspectives on *Need for KT in P&O*.

Continued on page 3

Meet International Scholar: José Luis Zavaleta Ruiz

R. J. Garrick, PhD

NUPOC welcomes International Scholar, **José Zavaleta**. Mr. Zavaleta is a Biomedical Engineering student at Iberoamericana University (Mexico City). During 9 months at NUPOC, Mr. Zavaleta will work collaboratively with researchers, **Steven A. Gard**, PhD, and **Matthew Major**, PhD, on a modular prosthetic component that adapts during walking to changes in terrain.

Mr. Zavaleta enjoys the creative application of engineering skills to solve biomedical problems. He used his programming skills in C language, MATLAB, NI LabVIEW, and others during internships at Escala Biomédica where he worked on the development of databases and medical and hospital equipment. At Iberoamericana University he programmed MATLAB to characterize facial features through polynomials and genetic algorithms to reduce characteristic errors in actual systems. He worked as a programmer at Enapsys. He also worked on signal recognition in electrocardiograms to diagnose Brugada's Syndrome. He has experience with patent documentation for the Mexico Institute for Intellectual Property (Instituto Mexicano de la Propiedad Intelectual).

He enjoys building and creating things. In high school, a visit to the Museum of Robotics (Mexico City) launched him on the path to engineering. He said, "*I felt inspired by the ways that machines, engines, and devices can improve human life.*" His father, a physician, urged him to consider a career in medicine. He decided to pursue biomedical engineering for its broad appli-



José Zavaleta

cation to solve problems and improve human lives.

Mr. Zavaleta's collaborative work at NUPOC is approved by his university department as a start-to-finish prosthesis design and development project that will culminate in a publishable article, scientific poster, and public presentation. This project is in partial fulfillment of requirements for his BS degree. Mr. Zavaleta noted, "*I am excited to work on the design and development of a modular ankle-foot prototype device that is analogous to human ankle*

physiology. Ankle-foot prostheses aim to provide normal gait for persons with lower limb amputation; however, not all commercial devices have adaptive mechanisms that mimic the anatomical function of the ankle. Traditional prostheses are designed and aligned for a level surface, making it difficult to walk on sloped terrain. Adaptable ankle-foot prostheses can improve quality of life for the users and more closely mimic the gait of able bodied persons."

Mr. Zavaleta enjoys sports, especially running, soccer, and swimming. He favorably compares his daily life in Chicago to Mexico City, "*Pedestrians have the right of way here and I can easily cross the street. Also, public transportation follows a reliable schedule. In Mexico City it takes me one and a half hours to commute about 4 miles, but in Chicago I commute only 15 minutes, so I have more personal time.*" He says, "*I feel comfortable in Chicago. The people here are friendly and approachable.*" Welcome to NUPOC, José!

Continued from page 2

web links reciprocity with other sites; and ways to reach older, practicing P&O clinicians.

Practical suggestions included: Identify the target audiences for KT; identify unproductive KT formats; provide manageable information about indexed topics delivered in 10-minute web-based audio-visual material; offer interruptible learning opportunities; establish an on-line glossary on the RERC website; use existing medical models and templates for effective KT; communicate with leaders and mentors in the P&O profession; demonstrate the clinical practice advantage of any behavioral change sought through KT; measure and publicize how KT efforts can improve practice; inform policy makers about the value and financial return on their investment; use low cost, online advertising mechanisms; promote community outreach to educate a wider audience, including high school students, career and college counselors; create an online sub-group run by and for P&O residents that features information appropriate for their stage of professional development; open professional accounts across all delivery platforms (e.g., YouTube,



Jerry Harris, PhD, spoke about Need for KT in P&O.

FaceBook, Twitter, Tumblr, etc.); post informative videos and webinars and offer certificates for participation and CE credits for practitioners; create an archive of gait data-bases; recognize that marketing and advertising funds are essential to meet dissemination mandates; implement change 10-minutes at a time using the "SMART" acronym (Simple, Measurable, Applicable, Repeatable, Timely); and involve stakeholders as early collaborators in research proposals, treatment modalities, and dissemination to clinicians and client users.

In closing, Steven A. Gard, PhD, summarized actions that the RERC for P&O can implement. The 2012 SOS Symposium on Knowledge Translation concluded with the renewed determination to work collaboratively and interactively with all NURERC stakeholders to promote knowledge in P&O.

A comprehensive report on the final outcomes of the 2012 NURERC State of the Science Meeting is forthcoming and will be available to the public at no charge at www.nupoc.northwestern.edu.

Stefania Fatone Keynotes at International and USA Meetings

R. J. Garrick, PhD



Josephine Bundoc (left) presents Certificate of Appreciation to Stefania Fatone (right) for her presentations at the Philippine Academy of Rehabilitation Medicine.

Stefania Fatone, PhD, BPO(Hons), has been invited to speak about Prosthetics and Orthotics (P&O) research at multiple global and domestic professional meetings. Her major presentations are highlighted below.

On July 6-8, 2012, Dr. Fatone delivered the keynote speech at the 3rd Annual Convention in Prosthetics and Orthotics, Current Trends in Pediatric Gait Analysis and P&O

information at a *Breakfast with the Experts* session at the 2010 AACPDM meeting.

Dr. Fatone was the Fall 2012 NIDRR Invited Lecturer in Outcomes Research for the NIDRR-funded *Rehabilitation Research and Training Center on Improving Measurement of Medical Rehabilitation Outcomes* held by the Center for Rehabilitation Outcomes Research (CROR). This lectureship required Dr. Fatone to present *Outcome Measurement for Prosthetics and Orthotics Clinical Practice*, to two different audiences.

On October 4, 2012, she addressed the Center for Healthcare Studies Seminar Series, where she presented *Outcome Measurement for Prosthetics and Orthotics Clinical Practice*. CROR, the Department of Medical Social Sciences (MSS), The Buehler Center on Aging, and VA Center for Management of Complex Chronic Care (CMC), co-hosted Dr. Fatone's presentation. On October 10, 2012, Dr. Fatone presented *Efforts to Improve Outcome Measurement in Prosthetics and Orthotics Clinical Practice* at the RIC Grand Rounds. Attendees learned about the field of P&O; available and needed outcome measures in P&O; and challenges to the implementation of outcome measures within P&O clinical practice.

Dr. Fatone is invited to be a Keynote Speaker at the International Society for Prosthetics and Orthotics, Australian National Member Society. She will deliver one-day, multidisciplinary, advanced instructional courses on *Orthotic Management of Stroke* in Canberra (Australia) on November 30 and in Melbourne (Australia) on December 3, 2012. To learn more about the course, view a program, or register to attend, visit: www.ispo.org.au.



Dr. Fatone was invited to present *Outcome Measurement for Prosthetics and Orthotics in Clinical Practice*.

Management, hosted by Physicians for Peace, in cooperation with the Philippine Academy of Rehabilitation Medicine (PARM), at the University of the Philippines (Manila). During her stay in Manila, she also conducted multiple didactic sessions, including *Overview: Instrumented Gait Analysis; Outcome Measures in Gait Analysis; 2D Video Based Assessment of Gait; Outcome Measures in Orthotics; The Ankle Foot Orthosis-Footwear Combination Approach; and Evidence for Orthotic Management of Stroke*. She also presented a talk on *Pediatric Orthotics* to clinicians in the Rehabilitation Department at the Philippine Children's Medical Center.

On September 12-15, 2012, Dr. Fatone was co-presenter of an instructional course at the American Academy of Cerebral Palsy and Developmental Medicine (AACPDM) 66th Annual Meeting in Toronto, Ontario, Canada. Dr. Fatone presented *The Importance of Being Earnest about Shank and Thigh Kinematics when Designing, Aligning and Tuning Ankle-Foot Orthosis Footwear Combinations (AFO-FC)*, with Elaine Owen, MSc, SRP, MCSP, (Head of the Community Paediatric Physiotherapy Department for North West Wales, UK); Deborah Gaebler-Spira, MD, (Director, Cerebral Palsy Program, Director, Early Intervention Program, Rehabilitation Institute of Chicago (RIC); Professor of Pediatrics and PM&R, Feinberg School of Medicine); and Donald McGovern, CPO, (Rehabilitation Institute of Chicago). Dr. Fatone and colleagues first presented this



Dudley S. Childress

Dudley S. Childress, PhD, Featured as Feinberg School of Medicine Notable

Dudley S. Childress, PhD, Professor and Director Emeritus of NUPOC, is featured as a Feinberg School of Medicine "Notable". For more than 40 years, Dr. Childress directed the Prosthetics Research Laboratory, which is now united with the Northwestern University Prosthetics-Orthotics Center (NUPOC) for education and research. Dr. Childress' outstanding work in the field of rehabilitation engineering improved the lives of many people who live with physical disabilities.

Read about Professor Childress' career contributions to biomedical and rehabilitation engineering at: www.feinberg.northwestern.edu/about/history/profiles.html.

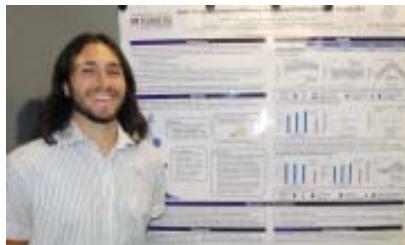
NUPOC Reports at AAOP Chapter Meeting

NUPOC educators and researchers reported on research projects at the Annual Meeting and Scientific Session of the Midwest Chapter of the American Academy of Orthotists and Prosthetists (AAOP) held September 27-29, 2012 at Lake Geneva, WI.

NUPOC researchers and their presentation titles were (in alphabetical order): **Ryan Caldwell**, *Progress Report: Sub-Atmospheric Suspension for Transfemoral Amputees*; **Sara Koehler**, *Transfemoral Prosthetic Alignment: When Does It Matter?*; **Oluseeni Komolafe**, *Stress Analysis of Different Transfemoral Prosthetic Socket Frame Designs*; **Matthew Major**, *Validation of the Berg Balance Scale for Individuals with Lower Limb Amputation*; **John Michael**, *Update on NUPOC's MPO Program*; **Chris Robinson**, *The*



Matty Major, PhD (left) and Oluseeni Komolafe, PhD (right), at the AAOP Midwest Chapter Meeting.



Matty Major presented his poster on validating the Berg Balance Scale.

NCOPE Residency: Training the Next Generation of Practitioner; **Chris Robinson**, **Yeongchi Wu**, and **John Michael**, *Development of a Low-Cost Dilatancy-Based System for Orthotic Fabrication: A Preliminary Report*.

Boutwell and Zissimopoulos Present “7-Minutes of Science”

Erin Boutwell, MS, and **Kiki Zissimopoulos**, MS, spoke about their research at “Seven Minutes of Science: An Interdisciplinary Symposium” (Evanston) on September 14, 2012. Their goals were to communicate their biomedical engineering doctoral work with confidence and clarity; and to explain it engagingly and meaningfully to an audience of any or no scientific background.



Kiki Zissimopoulos

Ms. Boutwell presented *With a Spring in One’s Step: How Low-Stiffness Prostheses Can Influence Walking*; and Ms. Zissimopoulos presented *Step by Step: Walking Post-stroke*.



Erin Boutwell

NUPOC Presents at 2012 MRS Training Day

NUPOC researchers presented posters at the 2nd Annual Musculo-skeletal Research (MRS) Training Day in the Feinberg School of Medicine on September 7. NUPOC submitted the following posters (the presenter’s name is underlined): *Effect of Fusion Surgery on Static and Dynamic Sagittal Spinal Alignment* by **Pranitha Gottipati**, **Stefania Fatone**, Tyler Koski, and Aruna Ganju; *Upper Body Kinematics of Bilateral Transtibial Prostheses* **Users during Gait** by **Matty Major**, **Rebecca Stine**, **Megan Hodgson**, and **Steven A. Gard**; and *Quantification of Trans-femoral Prosthetic Socket Fabrication* by **Oluseeni Komolafe**, Kerice Tucker, Ryan Caldwell, and **Stefania Fatone**.



Stefania Fatone, PhD (right), Steven A. Gard, PhD (center), presents findings at poster session.

Matthew Major Presents Clinical Research Grand Rounds



Rehabilitation Institute of Chicago

Matthew Major, PhD, was invited to present the Clinical Research Grand Rounds at the Rehabilitation Institute of Chicago (RIC) on October 8, 2012. Dr. Major presented *Validation of the Berg Balance Scale for Individuals with Lower Limb Amputation*. Co-authors on this work are **EJ Roth** and **S Fatone**.

The Clinical Research Grand Rounds are presented monthly by and for clinicians who focus on active, patient-oriented research.

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R. J. Garrick, PhD

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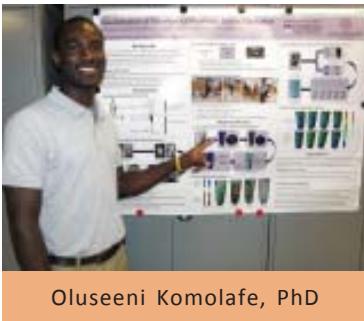
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NUPOC NEWS

Presentations

Matty Major, PhD, attended the 36th Annual Meeting of the American Society of Biomechanics in Gainesville, FL, from August 15 to 18, 2012. Dr. Major chaired the session, *Powered Exoskeletons & Prosthetics*. As first author, he also presented *Upper Body Kinematics of Bilateral Transtibial Prosthesis Users during Gait* in the Thematic Poster Presentation. Other authors were **R. Stine, M. Hodgson**, and **S. Gard**.

Oluseeni Komolafe, PhD, represented the NUPOC research team at the Military Health System Research Symposium (MHSRS) held in Ft. Lauderdale, FL, from August 13 to 16 2012. Dr. Komolafe is a member of a team at NUPOC that is working on *Development of Sub-Ischial Prosthetic Sockets*



Oluseeni Komolafe, PhD

with Assisted-Vacuum Suspension for Highly Active Persons with Transfemoral Amputations (**Stefania Fatone**, PhD, Principal Investigator). The 3-year project is funded by the U.S. Department of Defense. Dr. Komolafe presented a poster, *Quantification of Transfemoral Prosthetic Socket Fabrication*.

Awards



Jeff Henderson

Jeff Henderson has been awarded the **2012 Dale Yasukawa Scholarship**. The Orthotic & Prosthetic Activities Foundation (OPAF) awards the Yasukawa Scholarship to a NUPOC student to help pay for registration fees at AAOP meetings; and to purchase books, supplies and equipment for study at NUPOC. Mr. Henderson completed his Orthotics Certificate (NUPOC, 2009) and has completed his Prosthetics Certificate (NUPOC BLP16, 2012). He participated in a NUPOC

International Service (NUPOC-IS) P&O trip to Zacapa, Guatemala, where he worked in the Range of Motion Project (ROMP) clinic.

John Brinkmann, MA, CPO/L, FAAOP, received a Feinberg faculty teaching fellowship through the 2012-2013 Searle Fellows Program. William McGaghie, PhD, will mentor Mr. Brinkmann who plans to develop a task trainer to help instruct prosthetic learners in the proper evaluation and shape capture of transtibial residual limbs; and to investigate the possibility of implementing simulation technology in the NUPOC Masters of Prosthetics and Orthotics (MPO) program.

Publications

Fatone S and Dillon M. (2012). *Letter to the Editor*, Prosthetics and Orthotics International, published online July 6, 2012.

Waldera K, Heckathorne C, Parker M, Fatone S (2012). *Assessing the Prosthetic Needs of Farmers and Ranchers with Amputations*. Disability and Rehabilitation, Early Online: 1–9. DOI: 10.3109/17483107.2012.699994.

Robinson C, Fatone S (2012). Invited Paper: *You've Heard about Outcome Measures, So How Do You Use Them? Implementing of Clinically Relevant Outcome Measures in Orthotic Management of Stroke*. Prosthetics and Orthotics International, DOI: 10.1177/0309364612446650.

Meier MR, Hansen AH, Gard SA and McFadyen, A.K. (2012). *Unilateral Transfemoral Prosthesis Users' Performance and Movement Efficiency When Using the C-leg, 3R60 and the SNS Prosthetic Knee Joints on an Obstacle Course*. Journal of Rehabilitation Research & Development, 49(4), 583-596.

Nickel EA, Hansen AH and **Gard SA** (2012). *Prosthetic Ankle-Foot System That Adapts to Sloped Surfaces*. ASME Journal of Medical Devices 6(1), 011006, DOI:10.1115/1.4005787.

Grants Awarded

Steven Gard and **Matthew Major** are Co-Principal Investigators on *Validation and Critical Evaluation of the AOPA Prosthetic Foot Project Report*, funded by the American Orthotic and Prosthetic Association (AOPA) for 11/1/2012-10/31/2013.

Grant Proposal Submissions

Stefania Fatone applied as Principal Investigator on a proposal *Measuring Moisture and Temperature at the Prosthetic Socket Interface*, submitted to the DOD Peer Reviewed Orthopedic Research Program (PRORP) on September 25, 2012.

Stefania Fatone applied as Principal Investigator on a proposal titled *Development of Sub-Ischial Prosthetic Sockets with Assisted-Vacuum Suspension for Highly Active Persons with Transfemoral Amputations—Supplemental Funding* submitted to TATRCFY12JWMRP on September 27, 2012.

Letter of Intent Submissions

Gard SA. *Effect of Prosthetic Foot and Ankle Stiffness on Standing and Walking*. VA Letter of Intent resubmitted for the November 1, 2012 due date.

Gard SA. *Evaluation of a Vacuum-Based Impression and Alignment Device (V-BIAD)*. VA Letter of Intent resubmitted for the November 1, 2012 due date.

Gard SA and Major M. *Incidence and Covariates of Falls in Individuals with Upper Limb Amputations*. VA Letter of Intent resubmitted for the November 1, 2012 due date.

Meetings Attended

Azucena Rodriguez, PhD, attended the 2012 National IRACDA (Institutional Research and Academic Career Development Award) Conference hosted by the PENN-PORT program at the University of Pennsylvania in Philadelphia, Pennsylvania from June 17-19, 2012.

Educational Tours

Northwestern University Prosthetics-Orthotics Center (NUPOC) hosted a site visit for Kim Greitemann and Thomas Glapa (Germany) on August 20, 2012. **R.J. Garrick** managed the tour of NUPOC education and research facilities, and presentations by **Edward Grahn, Steven A. Gard, Oluseeni Komolafe, and Yeongchi Wu**.

NUPOC hosted a site visit for Monica Metzler (illinoisScience.org)

Continued on page 7

NUPOC NEWS

Continued from page 6

on September 13, 2012. **Stefania Fatone** and **R.J. Garrick** conducted the educational tour of NUPOC education and research facilities.

NUPOC hosted an educational tour of NUPOC education/research for Mr. and Mrs. Sullivano (Amputee Patient Support Group, Marionjoy Rehabilitation Hospital, Wheaton, IL) on September 25, 2012. **Matty Major, Steven A. Gard, and R.J. Garrick** conducted the tour and discussed the role of NUPOC Educational Models and volunteer research subjects.

NUPOC hosted a site visit for Ole Petersen and Jacob Ralph

(Orthopädiotechniks from Balgrist, Switzerland) on October 4, 2012. **R.J. Garrick** conducted the educational tour of NUPOC education/research facilities and facilitated meetings with research and education staff, attendance at the Center for Healthcare Studies Seminar Series (See *Fatone Keynotes* on page 4), and audits of the *NUPOC Scoliosis Orthotics Practicum* and *Transfemoral Prostheses Critique*.

NUPOC hosted a site visit for Lawrence Kuhn (FSM, Development) on October 8, 2012. **R.J. Garrick** and **Steven A. Gard** conducted the educational tour of NUPOC education and research facilities.

NUPOC Educational Tours: A Platform for Knowledge Translation (KT)

R. J. Garrick, PhD



Stefania Fatone explains research in P&O to graduate students in the Rush Occupational Therapy group that visited NUPOC.

Knowledge Translation (See *Spreading the Word*, pages 1-3) is an essential part of the NURERC mandate and we utilize multiple platforms for the public dissemination of information about rehabilitation engineering projects for Prosthetics and Orthotics (P&O), including publications, posters, presentations,

website, webinars, symposia, and the quarterly newsletter *Capabilities*. Another major platform for KT is the direct interaction of NUPOC personnel with interested visitors. Visitors to NUPOC gain meaningful information through direct and personalized interaction with NUPOC researchers and educators. During this quarter, NUPOC conducted seven tours that featured instructive presentations about NURERC research projects.

Throughout the year, NUPOC personnel present frequent educational programs about NURERC research projects to visiting groups and individuals. Up-to-date content engages and educates visitors from all backgrounds, including professionals, students, and interested laypersons. Over time, NUPOC has worked collaboratively with some schools and organizations, such as the Rush School for Occupational Therapy, Crystal Lake South High School, Society of Women Engineers, and others, to develop annual educational programs and tours.

On July 30, 2012, NUPOC hosted the second annual educational site visit for Linda M. Olson, PhD, BPO(Hons), presented *Overview of Current Research at NURERC for P&O*. **Desmond Masterton** MS, CO, CPed, presented a lecture-demonstration, *Upper Limb Orthoses*. **Craig Heckathorne**, MSc, presented a lecture-demonstration, *Upper Limb Prostheses*. Students eagerly asked questions and instructors responded thoughtfully and candidly to all inquiries. Rush OT students enjoyed the opportunity to interact directly with P&O specialists while examining and manipulating many types of orthoses and prostheses.

Frequent educational outreach programs, such as the Rush tour, represent one of many KT platforms that NUPOC promotes in both research and education. KT through personalized educational programs and tours is time and labor intensive; however, rehabilitation engineering for P&O can realize significant influence through these direct interactions with interested groups and individuals.



Craig Heckathorne (right) explains functional design of upper limb prostheses to the 2011 Rush OT group.



Desmond Masterton presented a detailed overview of upper extremity orthoses.

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NUPOC Researchers Present Academy Webinar

Azucena Rodriguez, PhD, and Stefania Fatone, PhD, BPO(Hons), presented a live webinar on August 22: "Spinal Motion during Walking in Persons with Transfemoral Amputation with and without Low Back Pain". Co-authors are **Rebecca Stine, MS,** and **Steven A. Gard, PhD.** Thirty-five individuals across the nation attended the webinar. The 1.5 MCE exam for Continuing Education Credit (approved for ABC, BOC and CB) requires a fee. The archived version can be accessed at no charge at the Academy Paul E. Leimkuehler Online Learning Center (OLC).



Azucena Rodriguez, PhD (left), and Stefania Fatone, PhD, BPO(Hons) (right), present a live webinar at NUPOC.

This NIDRR-funded research was awarded the 2012 Howard R. Thranhardt Lecture Award at the 38th American Academy of Orthotists and Prosthetists Annual Meeting and Scientific Symposium. The abstract was identified as one of the best submitted by the profession; and the researchers are recognized for advancing prosthetic and orthotic research and education.

Access this archived webinar at no charge: www.oandp.org/olc/course.asp?course_id=4e0abc59-b731-4646-9756-16d5b3f9fd42.