Scholarly Activities
Department of Physical Medicine and Rehabilitation
September – November 201

REGULAR FACULTY

Chih-Hung Chang

Grant Review:
(1) ZRG1 BBBP-J (55) Special Emphasis Panel/Scientific Review Group PAR Panel: Methodology and Measurement in the Behavioral and Social Sciences
(2) ZRG1 RPHB-Y(12) Risk, Prevention, and Health Behavior Small Business Panel: Small Business: Psycho/Neuropathology, Life Span Development, and STEM Education

Leora Cherney

Grant Awards.

Honors/Awards.
Received the Third Annual Excellence in Post-Stroke Award from the American Congress of Rehabilitation Medicine and the National Stroke Association. This award recognizes a clinician or researcher (individual or group) (e.g., a care team, a research team, a clinical group) who has advanced the field through their scientific and/or clinical efforts in the area of post-acute stroke. (Previous awardees: John Chae, MD – 2015; Pamela Duncan, PhD, PT, FAPTA, FAHA – 2016)

Invited presentations.

Cherney, L. R. Innovations in aphasia treatment research: Implications for the practicing clinician. One-day workshop presented at the annual meeting of the British Columbia Speech Language Hearing Association, Vancouver, Canada (October, 2017).

Cherney, L. R. Aphasia treatment across the modalities: Implications for the practicing clinician. Two-day workshop presented at Deer Lodge Center, Winnipeg, Canada (October, 2017).

**Peer Reviewed Conference Presentations.**

Andrea Alberto Domenighetti

Accepted: abstract for the 2018 ORS congress: "Rescued Myogenic Potential of Muscle Stem Cells Isolated from Contractured Muscle in Children with Cerebral Palsy using Cytidine Analog 5-Azacytidine". Domenighetti et al.

Lab poster presentation at the 2017 Glassman Brain, Mind and Behavior Symposium (Lakeforest College): "The Effects of 5-Azacytidine and Reversine treatment on Muscle Fiber Formation in Cerebral Palsy." Hendriksen et al

Grand Rounds presentation at the Shirley Ryan AbilityLab: "History and Current Thought on the Use of Stem Cells in Physical Medicine and Rehabilitation” Domenighetti (Sept 13th, 2017).

Grant Submitted R21: "Development of a New 3D-Printed Tissue Scaffold for Discovery and Therapeutic Applications in Cerebral Palsy ". Domenighetti and Shah.

Submitted Shirley Ryan Abilitylab-CHNF Infrastructure Center Grant: "Effect of Inflammation in Hypoxia-Induced Plasticity in Individuals with Spinal Cord Injury". Leung, Sandhu and Domenighetti.


Deborah Gaebler

Participant, AAPM&R Subcommittee – vision statement development “Advancing PM&R Bold”

Course Chair: AAPM&R Annual Meeting “Challenges of Dystonia in the Motion Analysis Lab”, Denver, October 2017

Chambers C, Gaebler D, Kording K et al: Manuscript accepted for publication “The Integration of Probabilistic Information During Sensorimotor Estimation is Unimpaired in Children with Cerebral Palsy”, PLOS ONE
Levi Hargrove

**Papers Published**


**Accepted Manuscript (Published online)**

Spanias J, Simon AM, Finucane S, Perreault E, **Hargrove L**. Online Adaptive Neural Control of a Robotic Lower Limb Prosthesis. *Journal of Neural Engineering* 10/11/17 DOI: 10.1088/1741-2552/aa92a8

**Conference Papers**


Spanias JA, Simon AM, **Hargrove LJ**. Across-user adaptation for a powered lower limb prosthesis. Published in Rehabilitation Robotics (ICORR), 2017 International Conference on, held July 17-20, 2017. **DOI:** [10.1109/ICORR.2017.8009473](https://doi.org/10.1109/ICORR.2017.8009473)

Earley EJ, Kaveny KJ, Johnson RE, **Hargrove LJ**, Sensinger JW Joint-based velocity feedback to virtual limb dynamic perturbations. Published in Rehabilitation Robotics (ICORR), 2017 International Conference on, held 17-20 July. **DOI:** [10.1109/ICORR.2017.8009430](https://doi.org/10.1109/ICORR.2017.8009430).

Lenzi T, Cempini M, Newkirk J, **Hargrove LJ**, Kuiken TA. A lightweight robotic ankle prosthesis with non-backdrivable cam-based transmission. Published in Rehabilitation
Grants Submitted


Allen Heinemann

Invited Lectures


Important to Measure Quality of Care Concepts for Custom Ankle-Foot Orthosis Users. Lecture presented during the Rehabilitation Outcomes Research Symposium, Fujian University of Traditional Chinese Medicine, Fuzhou, PRC, November 17, 2017.

Peer-Reviewed Presentations


**Peer-Reviewed Publications**


Proposals Submitted

National Institute on Aging, R18, Elder Mistreatment Screening Tool. Subcontract to Northwestern University (Post, PI)

National Institute on Aging, P30, Claude D. Pepper Older Americans Independence Center (OAIC) at Northwestern University. Subcontract to Northwestern University (Wolf and Linder, co-PIs)

National Institute on Deafness and Other Communication Disorders, R01, Defining Trajectories of Linguistic, Cognitive-Communicative and Quality of Life Outcomes in Aphasia (co-PI with Leora Cherney).

Awards

James Brady Award, Brain Injury Association of Illinois, “Our most prestigious honor, the James Brady Award is given to the person or institution who has made significant contributions to improving the lives of persons with brain injury,” 2017.

Service Activities

Member, Committee on Functional Assessment for Adults with Disabilities, National Academies of Sciences, Engineering, and Medicine’s, 2017 – present.

Arun Jayaraman

\textit{Invited Talks}


\textbf{Jayaraman A.} Impact of wearable robotics in a home environment on health and mobility. WeRob 2017 Conference, TIRR Memorial Hospital, Houston, Texas, November 2017.

\textit{Conference abstracts}


\textit{Papers Published}


Grants submitted


Jayaraman (PI): Pre-application to CDMRP Orthotics and Prosthetics Outcomes Research Award: “Use of smartphone sensors to quantify factors affecting prosthesis use” Submitted 10/20/17.

Todd Kuiken

Papers Published


Paper Accepted

Kuiken TA, Fey NP, Reissman T, Dumanian GA. Innovative Use of a Thighplasty Procedure to Improve Prosthesis Fit and Function in an Overweight Transfemoral Amputee. Accepted by PRS Global Open, October 2017.

Conference Papers

Lenzi T, Cempini M, Newkirk J, Hargrove LJ, Kuiken TA. A lightweight robotic ankle prosthesis with non-backdrivable cam-based transmission. Published in Rehabilitation Robotics (ICORR), 2017 International Conference on, held 17-20 July. DOI: 10.1109/ICORR.2017.8009403
Patents published

Lenzi T, Cempini M, Kuiken T. Polycentric Powered Ankle Prosthesis, US patent application # 15/482,663; Filed 4/7/2017. Published 10/12/2017

Patents Granted


Grants submitted

Kuiken (PI) “Thighplasty to Improve Prosthesis Fit and Function” CDMRP Peer-reviewed Orthopaedic Research Program Clinical Trial Award. Submitted 9/27/17.

Christina Marciniak

Working in collaboration with other NU faculty members, SRALab staff, Prentice Staff and Access Living, webinar for training for mammography technologists Optimizing Mammography Services for Women With Disabilities was completed and available online beginning October 2017. This can be found at http://yourcpf.org/breast-health-cancer-screening.


Shana Margolis

Volunteer/Course Medical Tent Captain, Annual Chicago Marathon 2017

Laura Miller

**Papers Published**


**Grants Submitted**

Miller (PI) “Development and Evaluation of a low-cost, Lightweight Prosthetic Arm System with Excellent Cosmesis” NIH R01, submitted 10/05/17.

Linda Morris

Presented a webinar on Tracheostomy Safety & Management, October 17

Presented on Tracheostomy Rounds, Association of Rehabilitation Nurses REACH Conference, Seattle, November 11


Monica Rho

Leslie Rydberg

Have been accepted for Membership in the Feinberg Academy of Medical Educators

W. Zev Rymer

**Awarded:** NIDILRR 90SIMS0001-01-00 (Rymer) PI 9/30/17 – 9/29/22 DHHS/ACL "A Multi-Center Clinical Trial to Evaluate the Effectiveness of Intermittent Hypoxia Therapy in Individuals with Spinal Cord Injury "


Published "Biomechanics and neural control of movement, 20 years later: what have we learned and what has changed?” by Nordin AD, **Rymer WZ**, Biewener AA, Schwartz AB,

September 15. Invited presentation "Mapping EMG profiles using high-density grids in stroke survivors" at OT Bioelettronica Day 2017 in Torino, Italy.


October 30. Invited presentation "Applications of Advanced Technology in Neurologic Rehabilitation: an overview of the RIC experience" at The Chinese University of Hong Kong, Department of Biomedical Engineering.

November 1. Invited presentation "An Analysis of Rehabilitation Robotics in Stroke and Spinal Cord Injury" at the Symposium on Advanced Rehabilitation Engineering Technology in Beijing, China.

Posters/Presentations: Neuroscience Annual Meeting, Washington, DC, November 13-15:

"Sources of muscle weakness in stroke survivors based on a motor unit simulation" by X. Hu, H Shin, *WZ Rymer*, NL Suresh


Neuroscience Poster Session 502.1. "Improving the sensitivity and stability of detecting proximal muscle MEPs through high-density EMG" by FA Mussa-Ivaldi, D Desantis, B Afsharipour, NL Suresh, *WZ Rymer*, LM Rogers


Neuroscience Poster Session 502.11. "Alteration of surface electromyogram patterns after botulinum toxin injection in stroke survivors" by B Afsharipour, S Chandra, *WZ Rymer*, NL Suresh


November 15. Neuroscience Poster Session 674.09. "Characteristics of sequential force development in stroke" by J Roh, S Lee, P Raghavan, *WZ Rymer*
Diane Dudas Sheehan

Presented “Systems of Care & Chronic Illness in Pediatrics” presented to PM&R 3rd year residents at the Shirley Ryan Ability Lab (SRAL), September 19

Presented “Neuromuscular Scoliosis Evaluation and Management” to PM&R residents /students during Pediatric rotation on 10/19/17 & 11/7/17 at SRAL

Presented “Comprehensive Evaluation and Practical Treatment of Children with Wounds” to PM&R residents & students during Pediatric rotation on 10/24/17 & 11/14 at the SRAL

Presented “Supporting clinicians to publish: Success of a publications committee at a tertiary care children’s hospital” ISAPN Midwest conference, Lisle IL, October 16

RESEARCH FACULTY

Anne Deutsch

Peer-Reviewed Presentations


Deutsch A. The Need to Demonstrate the Value of post-Acute Rehabilitation Care. Presented at the State of the Science Conference: The Value of Interventions to Promote Health and Function for People with Disabilities. Shirley Ryan AbilityLab; Chicago, IL; September 14, 2017.


**Peer-Reviewed Publications**


**Awards**

“Multiple Sclerosis Patient-Reported Outcome Performance Measure Development” subcontract to Northwestern University. Funded by the National Quality Forum.

Linda Ehrlich-Jones

**Invited Lectures**

The Rehabilitation Measures Database: A Knowledge Translation Tool for Promoting Adoption of Standardized Assessment Instruments. Lecture presented (with Allen Heinemann) as part of KTDRR’s 2017 Online KT Conference, November 1, 2017

**Peer-Reviewed Presentations**


**Peer-Reviewed Publications**

Gilbert A, Lee J, Ehrlich-Jones L, Semanik PA, Song J, Pellegrini CA, Pinto D, Dunlop DD, & Chang RW. A randomized trial of a motivational interviewing intervention to increase
lifestyle physical activity and improve self-reported function in adults with arthritis. Seminars in Arthritis & Rheumatism, in press.

Proposals Submitted

National Institutes of Health/NIAMS. Studying Physical Activity Rewards and Telephonic Active Coaching (SPARTAC), Losina at Brigham & Women’s Hospital (PI).

Service Activities

Secretary, American Congress on Rehabilitation Medicine, Measurement Networking Group

Sherri LaVela

Publications (published; in press, under review):


LaVela SL, Etingen BE, Cella D. Clinical validity of PROMIS-29® domains in a US veteran cohort. *Quality of Life Research.* (Revisions submitted October 2017)


**Presentations:**


**Grants Funded:**

National Multiple Sclerosis Foundation. *Evaluating the Use of Acute Intermittent Hypoxia to Enhance Motor Function in Persons with Multiple Sclerosis.* PI: LaVela; Co-I(s): Rymer, Jayaraman, Sandhu, Motl (Notice of funding – October 2017).

PI: LaVela; Co-I(s): Ehrlich-Jones, Heinemann, Applebaum, Pedersen, Pellegrini, Goldstein

Paralyzed Veterans of America Education Foundation. *Developing a Curriculum on Grief/Loss due to SCI for Health Providers.* PI: LaVela; Co-I(s): Bombardier, Burkhart. [funding period: June 2017-June 2018]

**Grants submitted/under review:**

Craig H. Neilsen Psychosocial Research. *Understanding the psychosocial impacts of airport travel through the experiences of persons with SCI.* PI: LaVela; Co-I(s): Ehrlich-Jones, Pedersen; Heinemann (submitted 7-17-17, funding decisions by January 1 2018)
Jessica Pedersen

Invited Lectures

Perceptions of storing a wheelchair on a commercial flight and identification of wheelchair damage. RESNA ANSI Standards Meeting on Air Travel, Paralyzed Veterans of America, Washington DC November 6, 2017.

Peer-Reviewed Presentations

b, Sparacio J. Recommending Wheelchairs Under the Medicare Competitive Bidding Program, ILOTA 2017 Annual Conference, Normal, IL November 9, 2017


Proposals Submitted


Department of Defense. Efficacy of an evidenced-based, transfer-training program (EBTTP) designed to educate full time WCUs living with SCI. Laura Rice PI University of Illinois Urbana-Champaign.

Service Activities

Integrated Design Innovation, IDI, Design Challenge with Northwestern University, University of Pennsylvania, MIT, and Carnegie Mellon, worked with Master’s Degree Students to demonstrate needs of people with disabilities in urban settings and using transportation. SRALAB, Chicago, IL and Evanston Campuses, October 27, 2017

Design for America, Northwestern University Engineering and Design Undergraduate Students- Seminar and Discussions on taking prototypes into the community. October 24, 2017.

AOTA Conference paper reviewer

Kiwanis Go Baby Go full-day workshop to build cars for children with disabilities. Dwight, IL, October 21, 2017

Parkinson’s Annual Symposium- SRALAB Representative, Northwestern University Fienberg Building, Chicago, IL, October 7, 2017

The Kids Equipment Network, Volunteer Equipment Clinic providing children with gently used wheelchairs and seating equipment, Alden Village, Bloomingdale, IL September 23, 2017
Annie Simon


Ming Wu, Elliot Roth et al: “Forced Use of the Paretic Leg Induced by a Constraint Force Applied to the Non-Paretic Leg in Individuals Post-stroke During Walking” is being considered for publication in the *Neurorehabilitation and Neural Repair*

**NORTHWESTERN UNIVERSITY PROSTHETICS AND ORTHOTICS CENTER**

**Publications:**


Presentations:


Dr. Stefania Fatone lectured on “Normal Human Locomotion” on September 22, 2017, as part of the PM&R residency program PGY2 resident core lecture series.


Stefania Fatone, PhD, BPO (Hons), and Ryan Caldwell, CP, FAAOP, taught the NU-FlexSIV Socket Course on October 5-6, 2017, to 12 prosthetists from The Netherlands, sponsored by OIM Orthopedie at their Arnhem location. On the final evening of the course, OIM hosted a lecture by Dr. Fatone and Mr. Caldwell, who addressed physical therapists and physicians interested in the NU-FlexSIV Socket.

Stefania Fatone, PhD, BPO (Hons), and Ryan Caldwell, CP, FAAOP, taught the NU-FlexSIV Socket Course on October 11-12, 2017, to 6 prosthetists from Norway and Denmark. ISPO Norge sponsored the course held at Sophies Minde Ortopedi in Oslo, Norway.

Matthew Major, PhD, delivered “Northwestern University Prosthetics-Orthotics Center: Graduate Education in Orthotics and Prosthetics & Applied Rehabilitation Research to
Optimize Interventions for Limb Loss” as an invited presentation for the University of Illinois at Urbana-Champaign Department of Kinesiology and Community Health Colloquium on October 20, 2017.


Awards:

Kierra Falbo (MPO 2018) received the 2017 Otto and Lucille Becker Award for the best orthotics abstract submitted as a poster for presentation at the AOPA National Assembly. She is the first NUPOC student to win this award. Established in 2012, the Otto and Lucille Becker Award encourages students and residents to present posters of exceptional content. Ms. Falbo's awarded abstract was "Characteristics of Delphi Processes in Orthotics and Prosthetics Research."

Jacalyn Sickels (MPO 2018) was the winner of the 2017 the New Jersey Chapter AAOP Robert Frank Scholarship for her narrative essay recounting unique life experiences that led her to train for a career in Prosthetics and Orthotics. The Scholarship provides a $1,000 award that Ms. Sickels will use to defray costs associated with P&O graduate training.

Meetings:

Stefania Fatone, PhD, BPO (Hons), visited Dr. Dick Plettenburg at Delft University of Technology, in The Netherlands on October 2, 2017. Dr. Plettenburg coordinates the Master’s degree in Biomedical Engineering and directs the Delft Institute of Prosthetics and Orthotics. Dr. Plettenburg conducted Dr. Fatone on a tour of the campus and introduced his research colleagues: Dr. Winfred Mugge who is working on projects on motor control; Dr. Tim Horeman who is developing surgical instruments; and Drs. Gerwin Smit and Heike Vallery who are working on prosthetics projects. Currently, Dr. Fatone serves on the Scientific Program Committee and works collaboratively with Dr. Plettenburg, who chairs the Scientific Program Committee for the 2019 ISPO World Congress.

Stefania Fatone, PhD, BPO (Hons), attended the Archives of Physical Medicine and Rehabilitation Editorial Board Meeting held in Atlanta, GA, on October 25, 2017.

Laboratory Visits/Events:

Matthew Major, PhD, toured the laboratories of Drs Yih-Kuen Jan, PhD, Elizabeth Hsiao-Weckslser, PhD, Ian Rice, PhD, and Manuel Hernandez, PhD, during his visit to the University of Illinois at Urbana-Champaign Department of Kinesiology and Community Health and Department of Mechanical Science and Engineering.

Appointments:
Kristin J Carnahan, MS, joined the faculty of the Northwestern University Prosthetics-Orthotics Center (NUPOC) this fall. She joins the program as an Instructor in Physical and Medicine and Rehabilitation within the Feinberg School of Medicine at Northwestern.

Dr. Stefania Fatone joined the NM Scholars Program as a faculty mentor to a high school student. The vision of the program is to offer enriching experiences that enable outstanding diverse high school students to explore and be better prepared for potential careers in medicine as future physicians and biomedical scientists.

**Grant Awards:**

Matthew Major, PhD, is a consultant on a Department of Veterans Affairs Merit Review Award titled “Improving Footwear Options for Women and Men Veterans with Amputations” (PI: A Hansen, PhD, Minneapolis VA Health Care System)

Matthew Major, PhD, is a Co-Investigator on a Department of Defense Peer Reviewed Orthopaedic Research Program Applied Research Award titled “Connecting Mechanical to Biomechanical Performance of Prosthetic Feet to Design Customized, Passive Devices that Provide Improved Mobility” (PI: A Winter, PhD, Massachusetts Institute of Technology)

Matthew Major, PhD, is a Co-Investigator on a Department of Defense Orthotics and Prosthetics Outcomes Research Program Prosthetics Outcomes Research Award titled “Targeting Balance Confidence as a Strategy to Increase Integration and Improve Outcomes in Users of Lower-limb Prostheses” (PI: N Rosenblatt, PhD Rosalind Franklin University)

Matthew Major, PhD, is a Co-Investigator on a Department of Defense Orthotics and Prosthetics Outcomes Research Program Prosthetics Outcomes Research Award titled “Women’s-Specific Footwear with Prosthetic Feet” (PI: E Russell Esposito, PhD, Center for the Intrepid, Brooke Army Medical Center)

Matthew Major, PhD, is a Co-Investigator on a National Science Foundation Faculty Early Career Development Program titled “CAREER: Tuning passive prosthetic leg dynamics to create low-cost, robust devices that can replicate physiological gait in multiple activities of daily living” (PI: A Winter, PhD, Massachusetts Institute of Technology)

**Grant Submissions:**

Dr. Stefania Fatone was co-investigator on an R03 submission to the NIH titled “Beta testing shared decision making resources to inform decisions about partial foot amputation in older people with vascular disease”. The PI is Dr. Michael Dillon from La Trobe University and co-investigator is Dr. Karen Andrews from Mayo Clinic.

Dr. Stefania Fatone was PI on a preapplication to the DOD Orthotics and Prosthetics Outcomes Research Program for the project titled “Comparative Effectiveness of Socket Casting Methods: Improving Form and Fit” with co-investigators Dr. Andrew Hansen from the Minneapolis VA and Dr. Andrea Cutti from INAIL.
Matthew Major, PhD, is a Co-Investigator on a full proposal submitted on October 2nd to the Department of Defense Peer Reviewed Orthopaedic Research Program (PRORP) titled “Development of 3D Printed Upper-limb Transitional Prostheses for Veterans and Military Personnel”. (PI: J Zuniga, PhD, University of Omaha at Nebraska).

OTHER FACULTY

Sylvia Duraski: received the Clinical Article Award by the Association of Rehabilitation Nurses Annual Meeting, Seattle, November 10: “The Importance of Monitoring Patients’ Responses to Medications: Increased Arousal after Administration of Zolpidem in Those with Hypoxic Ischemic Encephalopathy: A Case Study”