

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.

NIDILRR Field Initiated Project: Grant # 90IFRE0007. Improving Electronic Written Communication in Persons with Aphasia: A Clinical Trial.
9/29/2017 -9/28/2020. (PI: L. Cherney)

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. Progress in aphasia rehabilitation research: A personal perspective. Oral presentation at the annual conference of the American Congress of Rehabilitation Medicine. Atlanta, GA (October, 2017).

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).

Elman, R. J., **Cherney, L. R.**, & Simmons-Mackie, N. Recent trends in aphasia management: From bedside to community. Seminar presentation at the annual convention of the American Speech Language Hearing Association. Los Angeles, CA (November, 2017).

Peer Reviewed Conference Presentations.

Raymer, A. M., Rodriguez, A. D., & **Cherney, L. R.** Intensity in aphasia rehabilitation: Contrasting perspectives from neuroscience and cognitive psychology. Seminar presentation at the annual conference of the American Congress of Rehabilitation Medicine. Atlanta, GA (October, 2017).

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.

Provisional Patent App. No. 62/572,609 "Methods for Treating Contractured Muscle and Related Cultured Cells". Domenighetti, Lieber.

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

Hargrove LJ, Miller LA, Turner K, Kuiken TA. Myoelectric Pattern Recognition Outperforms Direct Control for Transhumeral Amputees with Targeted Muscle Reinnervation: A Randomized Clinical Trial. *Scientific Reports* 7(1), Article no. 13840, doi:10.1038/s41598-017-14386-w October, 2017.

Akhtar A, Aghasadeghi N, **Hargrove L**, Bretl T. Estimation of distal arm joint angles from EMG and shoulder orientation for transhumeral prostheses. *Journal of Electromyography and Kinesiology* 35:86-94. 8/1/2017.

Simon AM, Ingraham KA, Spanias JA, Young AJ, Finucane SB, Halsne EG, **Hargrove LJ**. Delaying Ambulation Mode Transition Decisions Improves Accuracy of a Flexible Control

System for Powered Knee-Ankle Prosthesis. *IEEE Transactions on Neural Systems and Rehabilitation Engineering* 25(8) August, 2017. DOI: 10.1109/TNSRE.2016.2613020

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

Cempini M, **Hargrove LJ**, and Lenzi T. Design, Development, and Bench-top Testing of a Powered Polycentric Ankle Prosthesis. The 2017 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2017), At Vancouver, Canada, Volume: 1064-1069.

Woodward RB, Cancio JM, Fisher R, **Hargrove LJ**, Rabago CA, Siewiorek D, Smailagic A. A virtual coach for upper-extremity myoelectric prosthetic rehabilitation. Published in *Virtual Rehabilitation (ICVR)*, 2017 International Conference on, held June 19-22, 2017. DOI: 10.1109/ICVR.2017.8007495

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*

Robotics (ICORR), 2017 International Conference on, held 17-20 July.

DOI: [10.1109/ICORR.2017.8009403](https://doi.org/10.1109/ICORR.2017.8009403)

Grants Submitted

Hargrove (PI) Pre-application: “Clinical Translation of Bionic Technologies for Improved Functional Outcomes of Wounded Warriors” MTEC-17-08-Multi-Topic Solicitation Number W81XWH-15-9-0001, submitted 10/30/17.

Hargrove (PI): “Flexible Epidermal Electrodes for Intuitive Control of Powered Arm and Leg Prostheses” CDMRP Peer-reviewed Orthopaedic Research Program – Applied Research Award. Submitted 9/27/17.

Allen Heinemann

Invited Lectures

Important to Measure Quality of Care Concepts for Custom Ankle-Foot Orthosis Users. Brain Injury Association of Illinois annual conference, Oakbrook Terrace, IL, October 20, 2017.

The Rehabilitation Measures Database: A Knowledge Translation Tool for Promoting Adoption of Standardized Assessment Instruments. Lecture presented (with Linda Ehrlich-Jones) as part of KTDRR's 2017 Online KT Conference, November 1, 2017.
Orthotist, Physical Therapist, and Patient Perspectives on Indicators of Quality Care for Users of Custom Ankle Foot Orthoses. Lecture presented as part of the Midwest Chapter AAOP Education Symposium, Chicago, IL, November 11, 2017.

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

Altman D, Struthers C, Roberts J, **Heinemann AW**, Alam S, Maliki M. Implementing Reporting Guidelines: Time for Action Workshop, Eighth Peer Review Congress, Chicago, IL, September 9, 2017.

Heinemann, AW, Chan, LC, Hoenig H, Collins G. Evaluation of Reporting Guideline Implementation by Editors of Rehabilitation-Related Journals. Poster presented at the Eighth Peer Review Congress. Chicago, IL, September 11, 2017.

Oehmke JF, **Heinemann AW**, Rukuni M, Lyambabaje A, Young SL, Post LA. Accelerating Agricultural Transformation: Policy Readiness and Policy Difficulty. Paper presented at the International Outcomes Measurement Conference, Chicago, IL, September 14, 2017.

Kisala P, Tulsy DS, **Heinemann AW**, Noonan V, Strasser D. Symposium Speaker, Spinal Cord Injury Patient Reported Outcomes: Transition from Research to Practice. American Congress of Rehabilitation Medicine Annual Meeting, Atlanta, GA, October 25, 2017.

Deutsch A, Constantine R, **Heinemann AW**, Zuckerbraun S. Quality Measurement in Inpatient Rehabilitation. Symposium presented at the American Congress of Rehabilitation Medicine Annual Meeting, Atlanta, GA, October 26, 2017.

Rafferty M, Lieber R, **Heinemann AW**, Hansen P, Brown CH, Sliwa J. Integrating Research into Clinical Settings: A New Model of Interdisciplinary Rehabilitation, American Congress of Rehabilitation Medicine Annual Meeting, Atlanta, GA, October 26, 2017.

Ehrlich-Jones L, Nitsch K, **Heinemann AW**, Mallinson T. Promoting Adoption of Standardized Outcome Measures Using the Rehabilitation Measures Database. Symposium presented at the American Congress of Rehabilitation Medicine Annual Meeting, Atlanta, GA, October 26, 2017.

Heinemann AW, Chan L, Hoenig H. How to Get Published: Authorship, Reporting Guidelines, and Reviewing in Medical Rehabilitation. Symposium presented at the American Congress of Rehabilitation Medicine Annual Meeting, Atlanta, GA, October 27, 2017.

Whyte J, Hart T, **Heinemann AW**, Dijkers M. Specifying Rehabilitation Treatments: Implementing a Common System for Clinical Education and Research Reporting. Symposium presented at the American Congress of Rehabilitation Medicine Annual Meeting, Atlanta, GA, October 27, 2017.

Peer-Reviewed Publications

Gecht J, Mainz V, Boecker M, et al. Development of a Short Scale for Assessing Economic Environmental Aspects in Patients with Spinal Diseases Using Rasch Analysis. Health and Quality of Life Outcomes, in press.

Holdnack J, Slotkin J, Tyner CE, Gershon R, **Heinemann AW**. NIH Toolbox Premorbid Ability Adjustments: Application in a Traumatic Brain Injury Sample Rehabilitation Psychology, in press.

Johnson N, Marquine M, Flores I, et al. Racial Differences in Neurocognitive Outcomes Post-Stroke: The Impact of Healthcare Variables. *J Int Neuropsychol Soc*, in press.

Ketchum JM, Cuthbert JP, Deutsch A, et al. Representativeness of the Spinal Cord Injury Model Systems National Database. *Spinal Cord*, in press.

LaVela SL, **Heinemann AW**, Etingen B, Miskovic A, Locatelli SM, Chen D. Relational empathy and holistic care in persons with spinal cord injuries. *Journal of Spinal Cord Medicine*. 2017;40(1):30-42.

Magasi S, Harniss M, Tulsy D, Cohen ML, Heaton RK, **Heinemann AW**. Test Accommodations for Individuals with Neurological Conditions Completing the NIH Toolbox - Cognition Battery: An Evaluation of the Frequency and Appropriateness. *Rehab Psychology*, in press.

Tulsy D, Holdnack J, Cohen ML, et al. Factor Structure of the NIH Toolbox Cognition Battery in Individuals with Acquired Brain Injury. *Rehabilitation Psychology*, in press.

Wilson CS, Forchheimer M, **Heinemann AW**, Warren AM, McCullumsmith C. Assessment of the relationship of spiritual well-being to depression and quality of life for persons with spinal cord injury. *Disabil Rehabil*. 2017;39(5):491-496.

Wong AWK, Lau SCL, Cella D, et al. Linking of the quality of life in neurological disorders (Neuro-QoL) to the international classification of functioning, disability and health. *Quality of life research: an international journal of quality of life aspects of treatment, care and rehabilitation*, in press.

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.

Host, International Objective Measurement Society conference, Shirley Ryan AbilityLab, September 15-16, 2017.

Arun Jayaraman

Invited Talks

Jayaraman A. Workshop: Towards a next generation of wearable robotic devices for human-oriented assistance and therapy. RehabWeek 2017, London, July 2017.

Jayaraman A. Wearable Robotics Conference: From Bench to Bedside, Clinical Applications of Wearable Robotics. WearRAcon China, National Disability Conference, Beijing, September 2017.

Jayaraman A. The Future of Rehabilitation Robotics: Possibilities & Challenges. Rehabilitation Technologies Symposium – Hälsostaden, Sweden. October 2017.

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

Conference abstracts

Hoppe-Ludwig S, Deems-Dluhy S, **Jayaraman A.** The Micro-Processor Controlled Orthosis: What is the Impact to the User, Versus the Stance Control Orthosis and Conventional Locked KAFO? **Podium.** AOPA World Congress. Las Vegas, NV, September 2017.

Papers Published

Lonini L, Gupta A, Deems-Dluhy S, Hoppe-Ludwig S, Kording K, Jayaraman A. Activity Recognition in Individuals Walking with Assistive Devices: The Benefits of Device Specific Models. *JMIR Rehabilitation and Assistive Technologies*, Vol 4, No 2 (2017): Jul-Dec. DOI: 10.2196/rehab.7317

Lonini L, Shewan S, Ghaffari R, **Jayaraman A.** Automatic detection of spasticity from flexible wearable sensors. The 2017 ACM International Joint Conference on Pervasive and Ubiquitous Computing and the 2017 ACM International Symposium on Wearable Computers. DOI: 10.1145/3123024.3123098

Lonini L, Reissman T, Ochoa JM, Mummidisetty CK, Kording K, **Jayaraman A.** Sensor Fusion to Infer Locations of Standing and Reaching Within the Home in Incomplete Spinal Cord Injury. *American Journal of Physical Medicine and Rehabilitation* 96(10): S128-S134

Bo X, Huebner A, Poellabauer C, O'Brien MK, Mummidisetty CK, **Jayaraman A.** Evaluation of Sensing and Processing Parameters for Human Action Recognition. 2017 IEEE International Conference on Healthcare Informatics. DOI: [10.1109/ICHI.2017.56](https://doi.org/10.1109/ICHI.2017.56)

Shawen N, Lonini L, Mummidisetty CK, Shaprii I, Albert MV, Kording K, Jayaraman A. Fall Detection in Individuals with Lower-Limb Amputations Using Mobile Phones: Machine Learning Enhances Robustness for Real-World Applications. *JMIR mHealth and uHealth* 5 (10), e151, 2017.

O'Brien MK, Mummidisetty CK, Bo X, Poellabauer C, Jayaraman A. Quantifying community mobility after stroke using mobile phone technology. UbiComp '17: Proceedings of the 2017 Association for Computing Machinery (ACM) International Joint Conference on Pervasive and Ubiquitous Computing and Proceedings of the 2017 ACM International

Symposium on Wearable Computers. Maui Hawaii, Sept 11-15, 2017; pp161-164.
DOI:10.1145/3123024.3123085.

Radhakrishnan S, Kohler F, Gutenbrunner C, **Jayaraman A**, Li J, Pieber K, Schiappacasse C. The use of the International Classification of Functioning, Disability and Health to classify the factors influencing mobility reported by persons with an amputation: An international study. *Prosthetics and Orthotics International* 41(4):412-419. August 2017.

Grants submitted

Jayaraman (Co-PI): Pre-application to National Football League: “Epidermal Biosensing Systems with Machine Learning-Based Detection and Monitoring of Concussion-Related Biomarkers” Submitted 10/31/17.O

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

Hargrove LJ, Miller LA, Turner K, **Kuiken TA**. Myoelectric Pattern Recognition Outperforms Direct Control for Transhumeral Amputees with Targeted Muscle Reinnervation: A Randomized Clinical Trial. *Scientific Reports* 7(1), Article no. 13840, doi:10.1038/s41598-017-14386-w October, 2017.

Serino A, Akselrod M, Salomon R, Martuzzi R, Blefari ML, Canzoneri E, Rognini G, van der Zwaag W, Lakova M, Luthi F, Amoresano A, **Kuiken T**, Blanke O. Upper limb cortical maps in amputees with targeted muscle and sensory reinnervation. *Brain* 140(11): 2993-3011; November 2017.

Reinkensmeyer DJ, Blackstone S, Bodine C, Brabyn J, Brienza D, Caves K, DeRuyter F, Durfee E, Fatone S, Fernie G, Gard S, Karg P, **Kuiken TA**, et al. How a diverse research ecosystem has generated new rehabilitation technologies: Review of NIDILRR’s Rehabilitation Engineering Research Centers. *Journal of NeuroEngineering and Rehabilitation* 14(1):109 November, 2017

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](https://doi.org/10.1109/ICORR.2017.8009403)

Patents published

Kuiken T, Peshkin M, Kaveny K. Safety Overload for Direct Skeletal Attachment. US patent application #15/495923. Filed 4/24/17; Published 10/26/17.

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

Kuiken T, Reissman T, Halsne E, Lipshultz R. Magnetic Electrical Connector for Assistive Devices. Application # 14/453,278, Filing date 8/6/14. Issued 8/29/17. Patent # US 9744056 B2

Kuiken T, Huang H. Identification and implementation of locomotion modes using surface electromyography. Published July 11, 2017. Issued 7/11/2017. Patent # US9700439 B1

Grants submitted

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

Kuiken (PI) "Development and Testing of Portable Manual Standing Wheelchair" CDMRP, Spinal Cord Injury Research Program – Translational Research Award. Submitted 11/29/17.

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>.

Flanigan M, Gaebler-Spira D, **Marciniak C**, Kocherginsky M. *Correlation of Spasticity and Pain in Adolescents and Adults with Cerebral Palsy*. Poster Abstract American Academy of Cerebral Palsy and Developmental Medicine Annual Meeting Montreal Canada, September 2017.

Marciniak C, Kaňovský P, Munin MC, Althaus M, Hanschmann A, Pulte I, and Hiersemenzel R. **Poster 70:** IncobotulinumtoxinA Sustainably Improves Upper Limb Spasticity—Pooled Analysis of Two Phase 3 Trials." AAPMR Annual Meeting, Denver Colorado, October 2017

Marciniak C, Kaňovský P, Munin MC, Althaus M, Hanschmann A, Pulte I, and Hiersemenzel R. IncobotulinumtoxinA Sustainably Improves Upper Limb Spasticity—Pooled Analysis of Two Phase 3 Trials." *PM&R* 9, no. 9: S159-S160. Supplement Sept. 2017.

Shana Margolis

Presented at the AAPM&R Annual Meeting: Effects of CDC Guidelines on Physiatric Practices in Different Regions of the Country: What's Up in the Midwest?", October 12

Volunteer/Course Medical Tent Captain, Annual Chicago Marathon 2017

Laura Miller

Papers Published

Hargrove LJ, **Miller LA**, Turner K, Kuiken TA. Myoelectric Pattern Recognition Outperforms Direct Control for Transhumeral Amputees with Targeted Muscle Reinnervation: A Randomized Clinical Trial. *Scientific Reports* 7(1), Article no. 13840, doi:10.1038/s41598-017-14386-w October, 2017.

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

Paper in press: "Body Image Perception After Tracheostomy, *ORL-Head and Neck Nursing*, 35(4)

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 "Organization of the motor-unit pool for different directions of isometric contraction of the first dorsal interosseous muscle," by Lei Y, Suresh NL, **Rymer WZ**, Hu X. *Muscle Nerve*. 2017 Sept 6. PMID: 28877550.

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,

Chen D, Horak FB. *J Neuroeng Rehabil*. 2017 Sept 11. PMID: 28893279.

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

Published "Relative contribution of different altered motor unit control to muscle weakness in stroke: a simulation study," by Shin H, Suresh N. **Rymer WZ**, Hu X. *J Neural Eng*. 2017 Oct 10. PMID: 28994667.

Published "Applying a pelvic corrective force induces forced use of the paretic leg and improves paretic leg EMG activities of individuals post-stroke during treadmill walking," by Hsu CJ, Kim J, Tang R, Roth EJ, **Rymer WZ**, Wu M. *Clin Neurophysiol*. 2017 Oct. PMID: 28826022.

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 502.12. "Effect of botulinum-toxin on motor unit activity in stroke survivors" by S Chandra, B Afsharipour, N Suresh, **WZ Rymer**,

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 502.13. "Acute intermittent hypoxia-induced neuroplasticity in individuals with incomplete cervical spinal cord injury" by MS Sandhu, B Afsharipour, A Adekunle, S Anastasopoulos, **WZ Rymer**

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 14. Neuroscience Poster Session 502.14. "Analysis of motor unit action potential shape and power spectral changes in surface EMG of hemiparetic stroke survivors" by NL Suresh, X Hu, B Jeon, **WZ Rymer**, presented in Washington, DC

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. Health Care Research Careers. Presentation to high school students about careers in health care research. Course: Introduction to Health Occupations, Naperville Central High School, Naperville, IL; November 17, 2017.

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.

Reigle B, Deutsch A. Research and Quality Improvement: Contributions to Evidence-Based Rehabilitation Nursing and Improved Patient Outcomes. The Association of Rehabilitation Nurses’ Annual Conference: REACH 2017; Seattle, WA; November 10, 2017.

Deutsch A, Constantine R, Heinemann AW, Zuckerbraun S. Quality Measurement in Inpatient Rehabilitation. Symposium presented at the American Congress of Rehabilitation Medicine Annual Meeting, Atlanta, GA, October 26, 2017.

Pardasaney P, Ingber M, Broyles I, Gillen E, Deutsch A, Parks K, Evron A, Rayner J, McMullen T, Levitt A. Assessing Quality of Care: Variation in Discharge to Community Rates From Post-Acute Care Settings. Presented at the American Congress of Rehabilitation Medicine Annual Meeting, Atlanta, GA, October 28, 2017

Daras L, Ingber M, Deutsch A, Hefe J, Perloff J. Variation in Hospital Readmission Outcomes among Inpatient Rehabilitation Facilities. Presented at the American Congress of Rehabilitation Medicine Annual Meeting, Atlanta, GA, October 28, 2017

Daras L, Deutsch A, Ingber M, Perloff J, Hefe J. Are Inpatient Rehabilitation Facilities' Medicare Margins Associated with Quality of Care? Poster presented at the American Congress of Rehabilitation Medicine Annual Meeting, Atlanta, GA, October 26, 2017

Peer-Reviewed Publications

Ketchum JM, Cuthbert JP, Deutsch A, et al. Representativeness of the Spinal Cord Injury Model Systems National Database. *Spinal Cord*, in press.

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 KTDORR's 2017 Online KT Conference, November 1, 2017

Peer-Reviewed Presentations

Ehrlich-Jones L, Nitsch K, Heinemann AW, Mallinson T. Promoting Adoption of Standardized Outcome Measures Using the Rehabilitation Measures Database. Symposium presented at the American Congress of Rehabilitation Medicine Annual Meeting, Atlanta, GA, October 26, 2017.

Barber C, Zell J, Yazdany J, Davis A, Ehrlich-Jones L, Thorne C, Everix D, Capelli L, & Michaud K. Towards recommendations on functional assessment status measures for rheumatoid arthritis: Preliminary results from a systematic review. Poster Presentation at American College of Rheumatology, San Diego, November 6, 2017.

Gilbert A, Lee J, Song J, Semanik P, Ehrlich-Jones L, Kwok CK, Dunlop DD, & Chang RW. The relationship between restless sleep and physical activity. Poster Presentation at American College of Rheumatology, San Diego, November 7, 2017.

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):

Ramanathan S, Suda KJ, Fitzpatrick M, Poggensee L, **LaVela SL**, Burns SP, Evans CT. Multi-drug resistant *Acinetobacter*: Risk factors and Outcomes in Veterans with Spinal Cord Injuries and Disorders. *American Journal of Infection Control*. 2017 Nov 1;45(11):1183-1189.

Binns-Calvey AE, Malhiot A, Kostovich CT, **LaVela SL**, Stroupe K, Gerber BS, Burkhart L, Weiner SJ, Weaver F. Validating domains of patient contextual factors essential to preventing contextual errors: a qualitative study conducted at Chicago area Veterans Health Administration sites. *Academic Medicine*. 2017 Sep;92(9):1287-1293. [PMID: 28353498]

Locatelli SM, Miskevics S, Etingen B, **LaVela SL**. Effect of environment on participation in spinal cord injuries/disorders: The mediating impact of resilience, grief, and self-efficacy. *Rehabilitation Psychology*. 2017;62(3):334-344. [PMID: 28581319]

LaVela SL, Balbale SN, Hill JN. Experience of using Photovoice in individuals with spinal cord injury. *Topics in SCI Rehabilitation*. In Press.

Hill JN, Etingen B, Miskevics S, **LaVela SL**. Correlates of self-reported physical function in individuals with spinal cord injuries and disorders: does self-efficacy matter? *Spinal Cord*. In Press. [PMID: 28585558]

Etingen B, Miskevics S, **LaVela SL**. The relationship between pain interference and psychosocial well-being among Veterans with spinal cord injuries/disorders. *Journal of Neuroscience Nursing*. In Press.

Evans CT, Fitzpatrick MA, Jones MM, Burns SP, Poggensee L, Ramanathan S, **LaVela SL**, Safdar N, Suda KJ. Prevalence and factors associated with multidrug-resistant Gram-negative organisms in patients with spinal cord injury. *Infect Control Hosp Epidemiol*, in press.

Hill JN, Locatelli SM, Bokhour B, Fix G, Solomon J, Muller N, **LaVela SL**. Use of the Consolidated Framework for Implementation Research (CFIR) to Evaluate Broad-Scale System Change. *BMC Research Notes*. (Revisions submitted September 2017)

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)

LaVela SL, Etingen B, Locatelli SM, Heinemann AW. What determines low satisfaction with life in persons with SCI/D? *Journal of Spinal Cord Medicine*. Accepted with revisions (Revisions submitted October 2017).

Bokhour, BG, Fix GM, Mueller NM, Barker AM, **LaVela SL**, Hill JN, Solomon JL, VanDeusen Lukas C. How can healthcare organizations implement patient-centered care? Examining a large-scale cultural transformation. *BMC Health Services Research*. (Revisions submitted November 2017)

Balbale SN, Gawron A, **LaVela SL**. Perceptions of patient-centered care among Veterans with gastroesophageal reflux disease on proton pump inhibitor therapy. *Patient Experience Journal*. (Revisions submitted November 2017)

Presentations:

Etingen B, Hill JN, Miller LJ, Schwartz A, **LaVela SL**, Jordan N. Partnering with Veterans to establish PTSD treatment plans using shared decision-making strategies: VA mental health provider perspectives. 2017 Wisconsin Warrior Summit. Milwaukee, WI. Poster Presentation. September 29, 2017.

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).

Department of Defense. *Perspectives and Preferences for Weight Management after Spinal Cord Injury*.

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

b, Sparacio J. The Seating and Wheeled Mobility (SWN) Evaluation: What Every OT Should Know, Workshop, ILOTA 2017 Annual Conference, Normal, IL November 10, 2017

Proposals Submitted

Craig H Neilsen Foundation. Influence of Cognitive Functioning on Self-Care Management and Prevention of Secondary Health Complications in Persons with Traumatic SCI. Ian Rice PI University of Illinois Urbana-Champaign.

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

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.

Simon AM, Ingraham KA, Spanias JA, Young AJ, Finucane SB, Halsne EG, Hargrove LJ. Delaying Ambulation Mode Transition Decisions Improves Accuracy of a Flexible Control System for Powered Knee-Ankle Prosthesis. *IEEE Transactions on Neural Systems and Rehabilitation Engineering* 25(8) August, 2017. DOI: 10.1109/TNSRE.2016.2613020

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:

Abernethy, L., **Duncan, J.**, Childers, W. (2017) "A Content Analysis on the Media Portrayal of Characters with Limb Loss." *Journal of Prosthetics & Orthotics*, Vol. 29, No. 4, pp. 170–176.

Dillon M, **Fatone S**, Quigley M (in press) An introduction to translational research for orthotists and prosthetists. *Journal of Prosthetics and Orthotics*.

Dillon M, **Fatone S**, Quigley M (in press) Uncertainty with long-term predictions of lower limb amputation prevalence and what this means for prosthetic and orthotic research. *Journal of Prosthetics and Orthotics*.

Sherwood, A., **Brinkmann, J, and Fatone, S.** (in press) "Review of Benefits to Practitioners of Using Good Patient-Practitioner Communication." *Journal of Prosthetics and Orthotics*.

Sherwood, A., **Brinkmann, J, and Fatone, S.** (2017) "Review of Benefits to Practitioners of Using Good Patient-Practitioner Communication." *Journal of Prosthetics and Orthotics*. DOI: 10.1097/JPO.000000000000165.

Reinkensmeyer D, Blackstone S, Bodine C, Brabyn J, Brienza D, Caves K, DeRuyter F, Durfee E, Fatone S, Fernie G, Gard S, Karg P, Kuiken TA, Harris GF, Jones M, Li Y, Maisel; McCue M, Meade MA, Mitchell H, Mitzner TL, Patton JL, Requejo P, Rimmer JH, Rogers WA, Rymer WZ, Sanford JA, Schneider L, Sliker L, Sprigle S, Steinfeld A, Steinfeld E, Vanderheiden G, Winstein C, Zhang LQ, Corfman T (in press) How a diverse research ecosystem has

generated rehabilitation technologies: Review of NIDILRR's Rehabilitation Engineering Research Centers. Journal of Neuroengineering and Rehabilitation.

Presentations:

Fatone S, Caldwell R (2017) Flexible Sub-Ischial Vacuum Socket Course. American Orthotic and Prosthetic Association World Congress, Pre-Conference Education Program, September 5, Las Vegas, NV.

Dillon M, **Fatone S** (2017) The experience of sequential partial foot and transtibial amputation: implications for shared decision making about amputation surgery. American Orthotic and Prosthetic Association World Congress, September 6-9, Las Vegas, NV.

Seale J, **Fatone S** (2017) Orthotic Management of Stroke. American Orthotic and Prosthetic Association World Congress, September 6-9, Las Vegas, NV.

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.

Kaluf B, Dillon M, **Major M, Fatone S**, Balasanov Y (2017) Can the AMP Test and patient demographics predict K-level in people with lower limb amputation? American Congress of Rehabilitation Medicine, 94th Annual Conference, Progress in Rehabilitation Research (PIRR). October 23-28, Atlanta, Georgia.

Fatone S, Caldwell R, Stine R, Tran L, Angelico J. (2017) Evaluation of the NU-FlexSIV Socket for Persons with Transfemoral Amputation: Interim Results. Midwest Chapter of the American Academy of Orthotists and Prosthetists, November 11, Chicago, IL.

Caldwell R, Tran L, Yohay J, Chung HU, Jung I, Rogers J, **Fatone S** (2017) Description and demonstration of a prototype residual limb monitoring system. Midwest Chapter of the American Academy of Orthotists and Prosthetists, November 11, Chicago, IL.

Quinlan J, Tran L, Yohay J, Poziembo B, **Fatone S** (2017) The effect of prosthetic socket texturing on socket suspension using mechanical loading. Midwest Chapter of the American Academy of Orthotists and Prosthetists, November 11, Chicago, IL.

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.

Duncan, J.C. presented “The effect of having comorbidities on finding employment through VR” at the Rehabilitation Educators Conference, National Council on Rehabilitation Education, Arlington, VA, October 26-28, 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-Weckler, 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 Protheses 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”