

REGULAR FACULTY

James Atchison: Lectured at NMH “Overview of Opioid Management (PGY-2) on 1/30 and “Rational Polypharmacy (PGY-2) on 1/31/14’

Attended the 25th Annual Osteopathic Winter Seminar, January 15-18

Ellen Casey:

Casey E, Hameed F, Dhaher YY. The Muscle Stretch Reflex throughout the Menstrual Cycle. *Med Sci Sports Exerc.* 2013 Oct 2 [Epub ahead of print].

Kennedy DJ, Schneider B, **Casey E**, Rittenberg J, Conrad B, Smuck M, Plastaras CT. Vasovagal Rates in Fluoroscopically Guided Interventional Procedures: A Study of Over 8,000 Injections. Accepted for publication in *Pain Medicine*. 2013 Oct 4 [Epub ahead of print].

Kennedy DJ, Plastaras C, ***Casey E**, Visco CJ, Rittenberg JD, Conrad B, Sigler J, and Dreyfuss P. “Comparative Effectiveness of Lumbar Transforaminal Epidural Steroid Injections with Particulate Versus Nonparticulate Corticosteroids for Lumbar Radicular Pain due to Intervertebral Disc Herniation: A Prospective, Randomized, Double-Blind Trial.” *Pain Medicine* (2014) [Epub for early view on 1/2/2014]. doi:10.1111/pme.12325

Presentation at the AAP: Impact of the Menstrual Cycle and Oral Contraceptives on Motoneuron Excitability

Chih-Hung Chang:

Appointed to the editorial board of the Archives of PM&R

Traditional Chinese Medicine Diagnosis "Yang-Xu Zheng": Significant Prognostic Predictor for Patients with Severe Sepsis and Septic Shock.

Lin SJ, Cheng YY, **Chang CH**, Lee CH, Huang YC, Su YC.

Evid Based Complement Alternat Med. 2013;2013:759748. Epub 2013 Oct 24.

PMID: 24282436 [PubMed - as supplied by publisher]

Webinar: “Demystifying Rasch Analysis for Clinical Application”, October 2, 2013

Leora Cherney:

Leora Cherney, PhD, was presented with the Honors of the Association at the annual convention of the Illinois Speech-Language-Hearing Association (ISHA). The Honors of the Association is the highest award of the association and is presented in recognition of distinguished contributions to the professions and to those they serve. At the award luncheon on Saturday February 8th, the Chair of the Honors Committee commented: “Dr. Cherney has made significant contributions to the profession of speech language pathology in ways that are relevant clinically, scientifically and academically. She has added to our core of knowledge concerning aphasia and aphasiology.”

Presentations.

Babbitt, E. M. The Intensive Comprehensive Aphasia Program. Seminar presented at the Annual Convention of the Illinois Speech-Language-Hearing Association, Rosemont, IL (February, 2014).

Pitts, L. & Logemann, J. Updates to Assessment and Treatment of Parkinson's Disease (PD)-related Dysphagia. Seminar presented at the Annual Convention of the Illinois Speech-Language-Hearing Association, Rosemont, IL (February, 2014).

Publications.

Cherney, L. R., Kaye, R. C., & van Vuuren, S. Acquisition and Maintenance of Scripts in Aphasia: A Comparison of Two Cuing Conditions. *American Journal of Speech-Language Pathology*. Accepted for publication.

Pitts, L. L., Hurwitz, R., Lee, J., Carpenter, J., & **Cherney, L. R.** Naming and Oral Reading for Language in Aphasia 6-Point Scale (NORLA-6): Validity, Reliability, and Sensitivity. *American Journal of Speech-Language Pathology*. Submitted.

Anita Halper will serve as a reviewer for poster presentations for the 2014 American Speech-Language-Hearing Association Health Care and Business Institute to be held in April, Las Vegas

Allen Heinemann:

Peer reviewed publications:

Kalpakjian CZ, McCullumsmith CB, Fann JR, Richards JS, Stoelb BL, **Heinemann AW**, Bombardier CH. Post-Traumatic Growth Following Spinal Cord Injury, *Journal of Spinal Cord Medicine*, in press.

Heinemann AW, Magasi S, Hammel J, Carlozzi NE, Garcia SF, Hahn EA, Lai J-S, Tulskey DS, Gray DB, Hollingsworth H, Jerousek S. Environmental Factors Item Development for Persons with Stroke, Traumatic Brain Injury and Spinal Cord Injury. *Archives of Physical Medicine and Rehabilitation*, in press.

Heinemann AW, Connelly L, Ehrlich-Jones L, Fatone S. Outcome Instruments for Prosthetics Clinical Applications. *Phys Med Rehabil Clin N Am* 25 (2014) 179–198.

Moore J, Raad J, Ehrlich-Jones L, **Heinemann AW**. Development and Use of a Knowledge Translation Tool: The Rehabilitation Measures Database, *Archives of Physical Medicine and Rehabilitation*, 2014;95(1):197-202.

Wong W, **Heinemann AW**, Miskovic A, Semik P, Snyder TM. Feasibility of Computerized Adaptive Testing for Collection of Patient-Reported Outcomes following Inpatient Rehabilitation *Archives of Physical Medicine and Rehabilitation*, Available online 16 January 2014.

Mallinson T, **Deutsch A**, Bateman J, Tseng H, Manheim L, Almagor O, **Heinemann AW**. Comparison of Discharge Functional Status After Rehabilitation in Skilled Nursing, Home Health, and Medical Rehabilitation Settings for Patients After Hip Fracture Repair, *Archives of Physical Medicine and Rehabilitation*, Volume 95, Issue 2, February 2014, Pages 209-217.

Wong WK, **Heinemann AW**, Wilson CS, Neumann H, Fann JR, Tate DG, Forchheimer M, Richards JS, Bombardier CH. Predictors of Participation Enfranchisement following Spinal Cord Injury: The Mediating Role of Depression and Moderating Role of Demographic and

Injury Characteristics Archives of Physical Medicine and Rehabilitation. Archives of Physical Medicine and Rehabilitation, in press.

Heinemann AW, Dijkers MP, Ni P, Tulsky DS, Jette A. Measurement Properties of the Spinal Cord Injury-Functional Index (SCI-FI) Short Forms Archives of Physical Medicine and Rehabilitation. Archives of Physical Medicine and Rehabilitation, in press.

Grant in preparation

NIDRR FIP, Robot-assisted rehabilitation

NINDS R01, Heinemann, “Novel methods for identification of TBI patients from EHRs for genetic studies”

Presentations:

Jensen SE, Butt Z, **Heinemann AW**, Cella D, Kuiken T, Dumanian GA. Perceptions of Upper Limb Transplantation Benefits and Risks: The Amputee Perspective. Paper presented at the annual meeting of the American Association for Hand Surgery, January 9, 2014, Kauai, HI.

Heinemann AW, Baum C, Tulsky D. Research Recommendations from the State of the Science Conference on Outcome Measurement in Medical Rehabilitation. Symposium at the Rehabilitation Psychology 2014 Conference, San Antonio, TX February 27, 2014.

Organization and Financing of Medical Rehabilitation Services in the USA: Implications for Research Priorities. Invited presentation at De Hoogstraat Revalidatie, Utrecht, The Netherlands, December 2, 2013.

Improving the Measurement Properties of Depressive Symptom Instruments: A Rasch Measurement Example. Invited presentation at the University of Michigan, Department of Physical Medicine and Rehabilitation, Ann Arbor, MI, February 14, 2014.

Petra Joseph:

Article “Acute Pain Control Challenges with Suboxone Therapy in a Patient with Compartment Syndrome Secondary to McArdle’s Disease: A Case Report and Review”, accepted for publication in Pain Medicine (“the Journal”)

Poster “Cervical Syringomyelia”, 2013 APS Meeting

Kristopher Karvelas is co-investigator: “Alterations in Upper Limb Muscle Activation Following Motor Point Block”. NICHHD/R24 Award (Rymer, PI)

Konrad Kording:

“The Database for Reaching Experiments and Models”, B Walker, K Kording. PloS One 8 (11), e78747

Todd Kuiken:

Presentations:

Kuiken, TA, TMR: Past, Present and Future. Project CARE Summit, San Diego Medical Center, December 6, 2013

Kuiken TA, Neural Interfaces for Artificial Limbs. American Association of Neuromuscular and Electrodiagnostic Medicine, 60th Annual Conference, San Antonio, Texas, October 18th, 2013

Kuiken TA, Building Bionic Interfaces, 38th Annual Edward Lambert Lecturer, Dale House University, Department of Medicine October 1, 2013.

Kuiken TA, Building Bionics, Int'l Congress of Rehab Robotics, Seattle, WA, June 26, 2013.

Publications:

J. Birdwell, **L. Hargrove**, **T. Kuiken**, and R. Weir, "Isolated Activation of the Extrinsic Thumb Muscles and Compartments of the Extrinsic Finger Muscles", *Journal of Neurophysiology*, 110:6, 1385-1392

A. Adewuyi, **L. Hargrove**, and **T. Kuiken**, "Towards Improved Partial-Hand Protheses: The Effect of Wrist Kinematics on Pattern-Recognition-Based Control" *Proceedings of the 6th International Conference of the IEEE EMBS Neural Engineering Conference*, San Diego, USA, Nov. 2013.

Hargrove L, **Simon A**, **Lipschutz R**, Finucane S, and **Kuiken T**. Non-Weight-Bearing Control of a Powered Transfemoral Prosthesis. *J Neuroeng Rehabil*, 10 (1), 2013.

Jayaraman A, Deeney S, Eisenberg Y, Mathur G, and **Kuiken T**. Global Position Sensing and Step Activity as Outcome Measures of Community Mobility and Social Interaction for an Individual With a Transfemoral Amputation Due to Dysvascular Disease. *Phys Ther*, Epub Oct 3, 2013

Hargrove L, **Simon A**, Young A, **Lipschutz R**, Finucane S, Smith D, and **Kuiken T**. Robotic Leg Control with EMG Decoding by an Amputee with Nerve Transfers. *New Engl J Med* 369: 1237-1242, 2013.

Rouse E, **Hargrove L**, **Perreault EJ**, Peshkin MA, and **Kuiken TA**. Development of a Mechatronic Platform and Validation of Methods for Estimating Ankle Stiffness During the Stance Phase of Walking. *J Biomech Eng* 135(8), Epub June 12, 2013.

Wendy Murray:

"Withdrawal Reflexes in the Upper Limb Adapt to Arm Posture and Stimulus Location", CL Peterson, ZA Riley, ET Krepkovich, **WM Murray**, EJ Perreault. *Muscle & Nerve*, 2013

"Feedback Compensation of Intrinsic Muscle Properties During Torque Regulation Tasks", X Hu, **WM Murray**, EJ Perreault. *Engineering in Medicine and Biology Society (EMBC) 2013, 35th Annual Meeting*

Eric Perreault:

"Dealing with Target Uncertainty in a Reaching Control Interface", EA Corbett, KP Kording, **EJ Perreault**. *PLOS ONE* 9 (1), e86811

"Deficits in Startle-Evoked Arm Movements Increase with Impairment Following Stroke", CF Honeycutt, **EJ Perreault**. *Clinical Neurophysiology*.

Christopher Reger:

Poster Presentation "Acute inpatient rehabilitation of a patient with West Nile Infection", AAP Meeting, February 27

Lecture "Guidelines to Physician Referral" – NUPOC, February 4

Monica Rho:

Selected as Junior Faculty Member of the AAP Research Committee Research Development Consulting Program

Lectures:

University of Chicago: Schwab Rehabilitation Hospital – “Femoroacetabular Impingement”

Northwestern Medical Faculty Foundation Internal Medicine Lecture Series – “Dispelling Common Myths about Hip Pain”

American Academy of Physical Medicine and Rehabilitation: Resident Physician Council - “Transitioning from Residency to Practice in PM&R”

Elliot Roth:

Recipient of the 2013 Edward Lowman Award from the American Congress of Rehabilitation Medicine in *recognition of energetic promotion of the spirit of interdisciplinary teamwork in rehabilitation*, November 15, 2013

Cordo P, Wolf SL, Lou J-S, Bogey R, Stevenson M, Hayes J, **Roth E**: Treatment of Severe Hand Impairment Following Stroke by Combining Assisted Movement, Muscle Vibration, and Biofeedback. *J Neurol Phys Ther* 2013;37: 194–203. DOI: 10.1097/NPT.000000000000023

Kim J, Park H, Bruce J, Sutton E, Rowles D, Pucci D, Holbrook J, Minocha J, Nardone B, West D, Laumann A, **Roth E**, Jones M, Veledar E, Ghovanloo M: The Tongue Enables Computer and Wheelchair Control for People with Spinal Cord Injury. *Sci Transl Med* 5, 213ra166 (2013). DOI: 10.1126/scitranslmed.3006296

W. Zev Rymer:

Advisory Board Meeting at KIST in Seoul, Korea, Dec 12-13, 2013.

Published “Sensitivity of fasciculation potential detection is dramatically reduced by spatial filtering of surface electromyography,” by Jahanmiri –Nezhad F, Barkhaus PE, **Rymer WZ**, Zhou P. *Clin Neurophysiol*. 2013 Dec 10; S1388-2457(13)01231-5. PMID 24388402

Published “Reducing abnormal muscle coactivation after stroke using a myoelectric-computer interface: a pilot study,” by Wright ZA, **Rymer WZ**, Slutzky MW. *Neurorehabil Neural Repair*. 2013 Dec 27. PMID 24376069

Thomas Schnitzer:

The mechanical consequence of actual bone loss and simulated bone recovery in acute spinal cord injury. Edwards WB, **Schnitzer TJ**, Troy KL. *Bone*. 2013 Dec 17;60C:141-147. doi: 10.1016/j.bone.2013.12.012. [Epub ahead of print]

Reorganization of Hippocampal Functional Connectivity with Transition to Chronic Back Pain. Mutso AA, Petre B, Huang L, Baliki MN, Torbey S, Herrmann K, **Schnitzer TJ**, Apkarian AV. *J Neurophysiol*. 2013 Dec 11. [Epub ahead of print]

Bone mineral and stiffness loss at the distal femur and proximal tibia in acute spinal cord injury. Edwards WB, **Schnitzer TJ**, Troy KL *Osteoporos Int*. 2013 Nov 5. [Epub ahead of print]

Towards a mechanism-based approach to pain management in osteoarthritis.

Malfait AM, **Schnitzer TJ**. Nat Rev Rheumatol. 2013 Nov;9(11):654-64. doi: 10.1038/nrrheum.2013.138. Epub 2013 Sep 17.

Brain white matter structural properties predict transition to chronic pain.
Mansour AR, Baliki MN, Huang L, Torbey S, Herrmann KM, **Schnitzer TJ**, Apkarian AV.
Pain. 2013 Oct;154(10):2160-8. doi: 10.1016/j.pain.2013.06.044.

Steven Stanos:

Presented “Comprehensive Approach to Assessing and Managing Chronic Pain”, 50th Annual The Year in Internal Medicine, January 16

Lectured at NMH: “Pathophysiology of Pain (PGY-2), 1/27; and “Multidisciplinary Approach to Chronic Pain” (PGY-2) on 1/28/14

Mary Zeigler presented “Prevention and Management of Pressure Ulcers”, Community Care Alliance at the RIC on 1/27/14; will present “Contemporary Wound Care Practices and the Role of O & P”, 40th Annual AAOP Annual Meeting, Chicago, 3/1/14

RESEARCH FACULTY

Anne Deutsch:

Peer reviewed publications:

Mallinson T, **Deutsch A**, Bateman J, Tseng H, Manheim L, Almagor O, **Heinemann AW**. Comparison of Discharge Functional Status After Rehabilitation in Skilled Nursing, Home Health, and Medical Rehabilitation Settings for Patients After Hip Fracture Repair, Archives of Physical Medicine and Rehabilitation, Volume 95, Issue 2, February 2014, Pages 209-217.

Lackland DT, Roccella EJ, **Deutsch, A**, Fornage M, George MG, Howard G, Kissela B, Kittner SJ, Lichtman J, Lisabeth L, Schwamm LH, Smith EE, Towfighi A, on behalf of the American Heart Association Stroke Council, Council on Cardiovascular Nursing, Council on Quality of Care and Outcomes and Research, and Council on Functional Genomics and Translational Biology. Factors Influencing the Decline in Stroke Mortality: A Statement for Healthcare Professionals from the American Heart Association/American Stroke Association, 2014; 45:315-353.

Ottenbacher KJ, Karmarkar AM, Graham JE, Kuo Y-F, **Deutsch A**, Reistetter TA, Snihi SA, Granger CV. Thirty-day hospital readmission following Discharge from Postacute Rehabilitation in Fee-for-service Medicare Patients. JAMA, in press (Feb 12, 2014).

Presentation, **Deutsch A**. Post Acute Care: Payment and Quality Initiatives. Grand Rounds at University at Alabama, Birmingham Medicine, Physical Medicine and Rehabilitation. January 17, 2014.

Presentation, **Deutsch A**. Improving Care Transitions: Policymakers’ Perspective. International Stroke Conference. San Diego, CA. February 14, 2014.

Book chapter, **Deutsch A**. Health Policy. In: P Larsen, editor. Chronic Illness, 10th edition. Jones and Bartlett, in development, 2014.

Health Policy:

Health policy, Section 1206 of the Bipartisan Budget Act of 2013 signed into law on December 26, 2013 requires the Secretary of HHS to establish a functional status quality measure in long term care hospitals not later than October 1, 2015. Anne Deutsch is leading the development of this quality measure under a contract with the Centers for Medicare and Medicaid Services.

<http://www.gpo.gov/fdsys/pkg/BILLS-113hjres59enr/pdf/BILLS-113hjres59enr.pdf>

SEC. 1206. PAYMENT FOR INPATIENT SERVICES IN LONG-TERM CARE HOSPITALS (LTCHS).

January 1, 2015, and ending September 30, 2017.”.

(c) ADDITIONAL QUALITY MEASURE.—Section 1886(m)(5)(D) of the Social Security Act (42 U.S.C. 1395ww(m)(5)(D)) is amended by adding at the end the following new clause:

“(iv) ADDITIONAL QUALITY MEASURES.—Not later than October 1, 2015, the Secretary shall establish a functional status quality measure for change in mobility among inpatients requiring ventilator support.”.

Ongoing service:

Chair, ACRM Award Committee

Linda Ehrlich-Jones:

Peer reviewed publications:

Moore J, Raad J, Ehrlich-Jones L, **Heinemann AW**. Development and Use of a Knowledge Translation Tool: The Rehabilitation Measures Database, *Archives of Physical Medicine and Rehabilitation*, 2014;95(1):197-202.

Heinemann AW, Connelly L, **Ehrlich-Jones L**, Fatone S. Outcome Instruments for Prosthetics Clinical Applications. *Clinics of Physical Medicine and Rehabilitation Clinics of North America*, 2014, 25(1):179-198.

Sun, K, Song J, Lee J, Chang RW, Eaton CB, **Ehrlich-Jones L**, Kwoh KC, Manheim LM, Semanik PA, Sharma L, Sohn M-W, & Dunlop D. Relationship of meeting physical activity guidelines with health-related utility. *Arthritis Care & Research*, 2013 Dec 10 (epub ahead of print).

Grants submitted:

Grant submitted, NIDRR FIP, Physical Activity Promotion to Decrease Fatigue in Persons with Multiple Sclerosis

Grant submitted, NIH R21, An Intensive Individualized Intervention to Increase Physical Activity in Persons with Parkinson’s Disease

PVA Education Foundation- Improving Psychosocial Outcomes following SCI/D with Measurement Resources

Ongoing service:

Co-Chair WFO, Northwestern University

Abstract reviewer, Midwest Nursing Research Society Annual Conference

Abstract reviewer, Society of Behavioral Medicine Annual Conference
Grant reviewer, Retirement Research Foundation
Internal reviewer for Buehler Center PCORI grant

Levi Hargrove:

J. Birdwell, **L. Hargrove**, T. Kuiken, and R. Weir, "Isolated Activation of the Extrinsic Thumb Muscles and Compartments of the Extrinsic Finger Muscles", *Journal of Neurophysiology*, 110:6, 1385-1392

A. Young, A. Simon, N. Fey, and **L. Hargrove**, "Intent Recognition in a Powered Lower Limb Prosthesis using Time History Information", *Annals of Biomedical Engineering*, DOI: 10.1007/s10439-013-0909-0

S. Wurth and **L. Hargrove**, "A Real Time Performance Assessment of Simultaneous Pattern Recognition Control for Multi-functional Upper Limb Prostheses" *Proceedings of the 6th International Conference of the IEEE EMBS Neural Engineering Conference*, San Diego, USA, Nov. 2013.

L. Smith and **L. Hargrove**, "Intramuscular EMG after Targeted Muscle Reinnervation for Pattern Recognition Control of Myoelectric Prostheses" *Proceedings of the 6th International Conference of the IEEE EMBS Neural Engineering Conference*, San Diego, USA, Nov. 2013.

R. Gajendran, D. Tkach, and **L. Hargrove**, "Crosspoint Switching of EMG Signals to Increase Number of Channels for Pattern Recognition Myoelectric Control" *Proceedings of the 6th International Conference of the IEEE EMBS Neural Engineering Conference*, San Diego, USA, Nov. 2013.

A. Simon, N. Fey, K. Ingraham, A. Young, and **L. Hargrove**, "Hargrove Powered Prosthesis Control During Walking, Sitting, Standing, and Non-Weight-Bearing Activities Using Neural and Mechanical Inputs" *Proceedings of the 6th International Conference of the IEEE EMBS Neural Engineering Conference*, San Diego, USA, Nov. 2013.

A. Young, A. Simon, N. Fey, and **L. Hargrove**, "Classifying the Intent of Novel Users During Human Locomotion Using Powered Lower Limb Prostheses" *Proceedings of the 6th International Conference of the IEEE EMBS Neural Engineering Conference*, San Diego, USA, Nov. 2013.

A. Adewuyi, **L. Hargrove**, and T. Kuiken, "Towards Improved Partial-Hand Prostheses: The Effect of Wrist Kinematics on Pattern-Recognition-Based Control" *Proceedings of the 6th International Conference of the IEEE EMBS Neural Engineering Conference*, San Diego, USA, Nov. 2013.

Invited Talks:

Levi Hargrove, "Development of a Neural Interface for Powered Lowered Limb Prosthetics", Marquette University Undergraduate/Graduate Student Seminar, Dec 11, 2013.

Media:

"Innovation Cities", CNBC, Aired, Nov 28, 2013

“The Bionic Leg, CNN Newsroom, Nov 28, 2013

“21 Science Fictions that Became Science Facts”, BuzzFeed.com, Dec 3, 2013

“Bionic Leg Listens to Muscles”, Science News Today, Nov 16, 2013

“The Bionic Leg Gets a Leg Up”, Neurology Today, November 7, 2013

Rosemarie King:

Publications:

Risk Adjustment of Ischemic Stroke Outcomes for Comparing Hospital Performance: A Statement for Healthcare Professionals From the American Heart Association/American Stroke Association. Katzan IL, Spertus J, Bettger JP, Bravata DM, Reeves MJ, Smith EE, Bushnell C, Higashida RT, Hinchey JA, Holloway RG, Howard G, **King RB**, Krumholz HM, Lutz BJ, Yeh RW; on behalf of the American Heart Association Stroke Council, Council on Quality of Care and Outcomes Research, Council on Cardiovascular and Stroke Nursing, Council on Cardiovascular Radiology and Intervention, Council on Cardiovascular Surgery and Anesthe. Stroke. 2014 Jan 23. [Epub ahead of print]

The stroke caregiver unmet resource needs scale: development and psychometric testing. **King RB**, Hartke RJ, Lee J, Raad J. J Neurosci Nurs. 2013 Dec;45(6):320-8. doi: 10.1097/JNN.0b013e3182a3ce40

Presentations:

Invited Paper Presentation for the *Stroke Article of the Year Award*. International Stroke Conference (ISC). Feb 11, 2014, San Diego, CA.

Invited symposium presenter ISC Sessions, *Assessing Stroke Caregiving Outcomes for Research and Practice: What Quality Measures Exist?* Feb 14, 2014, San Diego, CA.

Moderator: ISC Sessions Symposium, *Transitional stroke care: The intersection of practice, research, and policy*. Feb 14, 2014, San Diego, CA.

Annie Simon:

Simon AM, Fey NP, Ingraham KA, Young AJ, and Hargrove LJ. Powered prosthesis control during walking, sitting, standing, and non-weight-bearing activities using neural and mechanical inputs. *Proceedings of the 6th International Conference of the IEEE EMBS Neural Engineering Conference*, San Diego, CA, November 2013.

Young AJ, **Simon AM**, Fey NP, and Hargrove LJ. Classifying the intent of novel users during human locomotion using powered lower limb prostheses. *Proceedings of the 6th International Conference of the IEEE EMBS Neural Engineering Conference*, San Diego, CA, November 2013.

Simon AM, “Building Bionics”, Invited presentation, University of Michigan Rehabilitation Robotics Seminar Series, Ann Arbor, MI, November 19, 2013.

Ming Wu:

Yen SC, Landry JM, **Wu M**. Size of kinematic error affects retention of locomotor adaptation in human spinal cord injury. *J Rehabil Res Dev*. 2014 Jan;50(9):1187-200. doi: 10.1682/JRRD.2012.09.0175.

Wu M, Landry JM, Kim J, Schmit BD, Yen SC, Macdonald J. Robotic resistance/assistance training improves locomotor function in individuals post stroke: a randomized controlled study. *Arch Phys Med Rehabil*. 2014 Jan 15. pii: S0003-9993(14)00006-9. doi: 10.1016/j.apmr.2013.12.021. [Epub ahead of print]

ADJUNCT / OTHER FACULTY

Citlali Lopez-Ortiz:

Research Articles in Preparation:

López-Ortiz, C., Simkowski J., Doshi, K., Warnick J., Gomez, W, Stoykov, N., Gaebler-Spira, D. (2013) Motor learning using classical ballet and virtual reality feedback children with cerebral palsy: Clinical implication

López-Ortiz, C., Simkowski J, Doshi, K, Gomez, W, Stoykov, N, Gaebler-Spira, DJ. Classification of spasticity and dystonia in a virtual environment for motorlearning.

Albert MV, Gomez W, Miskovic A, Kording, K., López-Ortiz C, Structured dance class for people with Parkinson's disease improves clinical motor scores.

López-Ortiz C, Egan T. Dubon M, Gaebler-Spira, DJ Mobility improvements in adolescents with cerebral palsy after a structured ballet program after school.

Research Articles Submitted for Publication:

López-Ortiz, C., Simkowski J., Doshi, K., Gomez, W, Stoykov, N., Gaebler-Spira, D. (2013) Motor learning using classical ballet and virtual reality feedback children with cerebral palsy.

López-Ortiz, C., O'Shea, Rachoy T., Sarkar S., Mussa-Ivaldi F., Gaebler-Spira, D. Differential effects of rhythmic auditory stimulation on movement in normally developing children and children with spastic or spastic-dystonic cerebral palsy.

Publications in Print:

López-Ortiz C Simkowski J, Gomez W, Doshi K, Stoykov S, Warnick J, Gaebler-Spira D. Motor learning via low dimension remapping as a marker for spasticity and dystonia in cerebral palsy. Society for Neuroscience Program 43rd Annual Meeting, 2013.

Albert MV, Gomez W, Miskovic A, López-Ortiz C,. Mobility in Parkinson's disease is improved through classical ballet based instruction. Society for Neuroscience Program 43rd Annual Meeting, 2013.

López-Ortiz C, Dubon M, Gaebler-Spira, DJ Structured Dance Class for Cerebral Palsy After School. American Academy for Cerebral Palsy and Developmental Medicine, 67th Annual Meeting 2013.

Presentation: Evidence Based Adapted Ballet for Movement Rehabilitation. 2013 Illinois Association for Health, Physical Education, Recreation and Dance Convention, Pheasant Run Resort in St. Charles, IL, November 21-22, 2013

Pending Grant Application: Field Initiated Project- NIDRR. Department of Education. Title: Classification of spasticity and Dystonia in Children with Cerebral Palsy. Proposed project dates July 2014-July 2016. Role in the project: Principal Investigator.

Theresa Pape was awarded a grant from the CDMRP (Department of Defense), “rTMS: A Treatment to Restore Function after Severe TBI”. Project Period 2014-2017.

Jon Sensinger:

Gregg, R, E Rouse, L Hargrove, and **J Sensinger** (2014). Evidence for a Time-Invariant Phase Variable in Human Ankle Control. *PLOS One*, in press

Johnson, R and **J Sensinger** (2014). Comparing functional EMG characteristics between zero-order and first-order interface dynamics. *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, in press.

Berning, K, S Cohick, R Johnson, and **J Sensinger** (2014). Comparison of body-powered voluntary open and voluntary close prehensors for activities of daily living. *Journal of Rehabilitation Research and Development*, in press.

Nickel E, **J Sensinger**, and A Hansen, Passive Prosthetic Ankle-Foot Mechanism for Automatic Adaptation to Sloped Surfaces, *Journal of Rehabilitation Research and Development*, in press.

Gregg, R and **J Sensinger** (2014). Towards biomimetic virtual constraint control of a powered prosthetic leg. *IEEE Transactions on Control Systems Technology*, DOI: [10.1109/TCST.2012.2236840](https://doi.org/10.1109/TCST.2012.2236840).

Invited speaker: DARPA/MTO Sensorimotor Prosthetics Workshop (2014), Scottsdale AZ.

NUPOC

NUPOC and the Department celebrated Associate Director **Edward Grahn** on December 20, 2014 for his nearly 50 years of service at Northwestern University. Mr. Grahn retired on December 31, 2013. In 1964, Clinton Compere, MD, invited Mr. Grahn to become Director of the Northwestern University Prosthetics Research Laboratory (NUPRL). Mr. Grahn directed NUPRL from 1964 until 1972, when Dudley Childress, PhD, succeeded him as director. Prior to his retirement, Mr. Grahn was intrinsically involved in the institutional development of the research and education programs at NUPOC, working collaboratively on design and development projects in rehabilitation engineering.

Christopher Robinson received the Outstanding Educator Award by the American Academy of Orthotists and Prosthetists Board of Directors, presented at the AAOP Annual Meeting in February, Chicago

Publications:

Komolafe, O., Wood, S., Caldwell, R., Hansen, A., **Fatone S**, (2013) Methods of Characterization of Mechanical and Electrical Prosthetic Vacuum Pumps. Journal of Rehabilitation Research and Development, Vol. 50, No.8, pp. 1069-1078.

Major MJ, Twiste M, Kenney LPJ, Howard D. (2014) The effects of prosthetic ankle stiffness on ankle and knee kinematics, prosthetic limb loading, and net metabolic cost of trans-tibial amputee gait. Clinical Biomechanics, Vol 29, No. 1, pp. 98-104.

Major, M.J., Stine, R.L. and Gard, S.A. (2013). The Effects of Walking Speed and Prosthetic Ankle Adapters on Upper Extremity Dynamics and Stability-Related Parameters in Bilateral Transtibial Amputee Gait. Gait & Posture, 38(4), 858-863.

Fatone S, (2013) Commentary on “The Swing Phase of Walking with Above-Knee Prostheses” by Dr. Eugene F. Murphy. Journal of Rehabilitation Research and Development, Vol. 50, No. 9, pp. xvii.

Kluger D, **Major MJ, Fatone S, Gard S.** (2014) The effect of trunk flexion on lower limb kinetics of able-bodied gait. Human Movement Science. [Epub ahead of print]
<http://dx.doi.org/10.1016/j.humov.2013.12.006>

Heinemann A, Connelly L, Ehrlich-Jones L, **Fatone S** (2014) Outcome Instruments for Prosthetics: Clinical Applications. Physical Medicine and Rehabilitation Clinics of North America, 25:179–198.

Zissimopoulos A, Stine R, Fatone S, Gard SA (accepted for publication) Mediolateral foot placement accuracy during ambulation in individuals with chronic post-stroke hemiplegia. Gait and Posture.

Research led by **Drs. Stefania Fatone and Steven Gard** and directed by **Craig Heckathorne** was featured in an article in Farm Week Now, the website of the Illinois Farm Bureau, titled "Northwestern survey chance for amputee farmers to be heard" by Kay Shipman published November 11, 2013. <http://farmweeknow.com/story-northwestern-survey-chance-amputee-farmers-heard-1-104458>

This research was also featured in an article in Modern Farmer titled “The Future of Farmer Prosthetics” by Rose Eveleth published on January 2, 2014.
<http://modernfarmer.com/2014/01/future-farmer-prosthetics/>

Presentations:

Craig Heckathorne (2013) Upper-limb Prosthetics: Myoelectric Control and Electric-powered Components. Guest Lecture Department of Biomedical Engineering, Marquette University, Milwaukee, Wisconsin, November 18.

Craig Heckathorne was interviewed by RFD Radio Network, the radio network of the Illinois Farm Bureau, on a project led by **Drs. Stefania Fatone and Steven Gard** surveying farmers and ranchers with limb amputations, broadcast November 21, 2013.

Dr Stefania Fatone and Craig Heckathorne were interviewed by ABC Rural Radio in Australia regarding their NIDRR funded research assessing the prosthetic needs of farmers and ranchers. The interview went to air on Thursday January 30, 2013 during the program [South](#)

Australia Country Hour which airs daily from noon to 1pm. The interview can be accessed at <http://www.abc.net.au/news/2014-01-30/prosthetic-farming/5228084>

Drs. Stefania Fatone and Matthew Major were invited to present as part of the American Academy of Orthotists and Prosthetists One Day Certificate Course on “Using Outcomes to Transform O&P Devices into Healthcare Interventions” delivered at the Hanger Education Fair on February 6 in Las Vegas, Nevada and at the 40th American Academy of Orthotists and Prosthetists (AAOP) on March 1 in Chicago, Illinois. Dr Fatone presented on “Outcome measures for stroke and traumatic brain injury” and Dr Major presented on “Creating a Framework for Patient Care: Introduction to the ICF and Psychometric Properties.” This one day certificate course is chaired by **Christopher Robinson**.

Fatone S, Stine R, McGovern D, Pavone L (2014) Improving lower extremity orthotic management of children with Cerebral Palsy: AFO-FC case studies. 40th American Academy of Orthotists and Prosthetists Annual Meeting & Scientific Symposium, February 26-March 1, Chicago, Illinois.

Fatone S, Tucker K, Johnson WB, Kwak S (2014) A 3D simulation tool to investigate the effects of ankle foot orthosis joint misalignments. 40th American Academy of Orthotists and Prosthetists Annual Meeting & Scientific Symposium, February 26-March 1, Chicago, Illinois.

Fatone S, Caldwell R (2014) Subischial Socket with Vacuum Assisted Suspension for Persons with Transfemoral Amputation. 40th American Academy of Orthotists and Prosthetists Annual Meeting & Scientific Symposium, February 26-March 1, Chicago, Illinois.

Heckathorne C, Stine R, Major M, Gard S, Fatone S (2014) Investigating the Effects of Prosthetic Hand Design on Performance. 40th American Academy of Orthotists and Prosthetists Annual Meeting & Scientific Symposium, February 26-March 1, Chicago, Illinois.

Major MJ, Raghavan P, Gard SA. (2014) Estimating step length of lower limb prosthesis users with a low-cost accelerometer. 40th American Academy of Orthotists and Prosthetists Annual Meeting & Scientific Symposium, February 26-March 1, Chicago, Illinois.

Hansen A, Owen E, **Fatone S** (2014) From Stable Standing to “Rock’n’Roll” Walking. 40th American Academy of Orthotists and Prosthetists Annual Meeting & Scientific Symposium, February 26-March 1, Chicago, Illinois.

Educational Tours:

Northwestern University Prosthetics-Orthotics Center (NUPOC) hosted an interactive educational program and tour for science teachers, administrators, and 50 Advanced Placement science students from Crystal Lake South High School (Crystal Lake, IL) on December 3, 2013.

Northwestern University Prosthetics-Orthotics Center (NUPOC) hosted an educational tour for 11th grade students from the Perspectives Charter High Schools (Chicago) on December 11, 2013. **R. J. Garrick, PhD**, developed this program in collaboration with the Feinberg School of Medicine Community Medicine Community Engagement Program (CCEP), the Family Medicine Interest Group (FMIG), and the T. K. Lawless Society.

NUPOC hosted an open house as part of the 40th American Academy of Orthotists and Prosthetists (AAOP) Annual Meeting & Scientific Symposium which was held in Chicago from February 26 to March 1. The “ERGO Soiree” was held at NUPOC on February 27 from 6-8 pm. Meeting participants were able to tour NUPOC’s research and education facilities and view mini presentations co-hosted by the AAOP Gait Society on topics such as instrumented motion analysis, low cost gait measurement tools, outcome measures, clinically relevant research and NUPOCs Masters in Prosthetics and Orthotics blended learning program.

Meetings:

Dr Stefania Fatone participated in a National Institutes of Health (NIH) review panel held in Washington, DC on December 4. The panel was convened to review SBIR applications (Small Business Innovation Research) submitted in response to a special solicitation on pediatric orthotics. **Dr Stefania Fatone** participated in a grant review panel in February 2014 on behalf of the Orthotic and Prosthetic Education and Research Foundation.

Dr Stefania Fatone was invited to participate in a meeting of The Orthotic and Prosthetic Alliance held in conjunction with the 40th American Academy of Orthotists and Prosthetists annual meeting, February 26, 2014. The O&P Alliance is a coalition of the leading national organizations, including the American Academy of Orthotists and Prosthetists (AAOP); the American Board for Certification in Orthotics, Prosthetics & Pedorthics (ABC); the American Orthotic & Prosthetic Association (AOPA); the Board of Certification/Accreditation (BOC), and, the National Association for the Advancement of Orthotics and Prosthetics (NAAOP), representing the orthotic and prosthetic profession. The meeting was convened to discuss possible approaches to advocate for research funding at the federal level.

Dr. Steven Gard served on the Graduate Fellowship Program review committee for the National Science Foundation (NSF) in January 2014.

Patents:

Hansen, A., Gard, S.A., Childress, D., Ruhe, B., Williams, R. (2013). Equilibrium-Point Prosthetic and Orthotic Ankle-Foot Devices. United States Patent 8,597,369.

Grant Awards:

Dr Stefania Fatone is Principal Investigator on a one year clinical trial award sponsored by Myomo Inc. to study the “Effect of myoelectric custom orthosis on upper limb function.”

Gard, S. and Major, M. “Fall Risk and Prosthetic Influence on Gait Biomechanics in Upper Limb Amputees.” Funded by the Department of Veterans Affairs, 01/01/2014-12/31/2015.

Gard, S. “Effect of Prosthesis Stiffness on Impact Force During *In Vivo* Step Loads and Gait.” Funded by the Department of Veterans Affairs, 04/01/2014-03/31/2016.

Dr Matthew Major is Principal Investigator on a five year Career Development Award sponsored by the Department of Veterans Affairs to study the “Sensory-motor mechanisms underlying fall risk in transtibial amputees.”

Grant Submissions:

Gard, S. and Heckathorne, C. “Force Feedback to Improve Performance of Transradial Prosthesis Users.” Submitted to the Department of Veterans Affairs, December 11, 2013.

Gard, S. and Heckathorne, C. “Pressure-based Design of a Frame-type Transradial Socket.” Submitted to the Department of Veterans Affairs, December 11, 2013.

Gard, S. “Development and Evaluation of the GroundControl Shoe.” Submitted to the Department of Veterans Affairs, December 11, 2013.

Drs. Matthew Major and Stefania Fatone submitted an application on December 15 to the Boston ROC for a pilot study titled “Refinement of a performance-based outcome measure to assess balance in lower limb prosthesis users”.

Drs. Matthew Major and Keith Gordon (NU Dept. Physical Therapy and Human Movement Sciences) submitted an application on January 17 to the Orthotic and Prosthetic Education and Research Foundation for a small project titled “Effects of prosthetic ankle-foot stiffness on lateral stability of below-knee prosthesis users”.

Dr Stefania Fatone submitted two applications on February 11 to the DOD Clinical and Rehabilitative Medicine Research Program Neuromusculoskeletal Injuries Research Award. Dr Fatone is PI on the application “Flexible Sockets for Persons with Transtibial Amputation” and a co-investigator on the application “Improving Socket Climate and Comfort in Lower-Limb Prostheses” (PI: Andrew Hansen).

Gard, S. “Effect of Prosthetic Foot and Ankle Stiffness on Standing and Walking.” Submitted to the DOD Clinical and Rehabilitative Medicine Research Program (CRM RP) Neuromusculoskeletal Injuries Research Award, February 11, 2014.