

Scholarly Activities
Department of Physical Medicine and Rehabilitation
Quarter June-August 2015

Regular Faculty

James Atchison:

Fellow/ Resident Lectures:

6/9 - WC/ IME's Lecture (RIC)

7/12 - Intro to Pain Physician Exam Lecture (RIC)

8/11 - Introduction to Interdisciplinary Pain Management Part 1- PGY2 & PGY3 (RIC)

8/18 - Opioids II- PGY2 & PGY3 (RIC)

Edie Babbitt:

Babbitt, E. M., Worrall, L. E., & **Cherney, L. R.** (2015). Structure, processes, and retrospective outcomes from an Intensive Comprehensive Aphasia Program. *American Journal of Speech Language Pathology*, doi: 10.1044/2015_AJSLP-14-0164. [Epub ahead of print]

Randy Calisoff:

Fellow/Resident Lecture: 6/15 – UDS Fellow Lecture (RIC)

Leora Cherney:

Morean, D. F., O'Dwyer, L., **Cherney, L. R.** (2015). Therapies for cognitive deficits associated with chemotherapy for breast cancer: A systematic review of objective outcomes. *Archives of Physical Medicine and Rehabilitation*, pii: S0003-9993(15)00424-4. doi: 10.1016/j.apmr.2015.05.012. [Epub ahead of print]

Cherney, L. R., Kaye, R. C., Lee, J. B., & van Vuuren, S. (2015). Impact of personal relevance on acquisition and generalization of script training for aphasia: A preliminary analysis. *American Journal of Speech Language Pathology*, in press.

Peer Reviewed Conference Presentations

Cherney, L. R., Lee, J. B., & Carpenter, J. Efficacy of a Computer-Based Writing Program for Aphasia. Platform presentation at the annual Clinical Aphasiology Conference, Monterey, CA (May-June, 2015).

Cherney, L. R., Kaye, R. C., Hitch, R., & van Vuuren, S. Examining complexity and feedback during script training in aphasia. Poster presentation at the annual Clinical Aphasiology Conference, Monterey, CA (May-June, 2015).

Deborah Gaebler:

Faculty: Pediatric Hemiplegia Symposium, Department of PTHMS and RIC

Presenter: 1st NU Early Motor Development Research Meeting – Robotics and Cerebral Palsy, June 30

Allen Heinemann:

Peer reviewed publications

Kisala PA, Tulsy DS, Kalpakjian CZ, **Heinemann AW**, Pohlig RT, Carle A, Choi SW. Measuring anxiety after spinal cord injury: Development and psychometric characteristics of the SCI-QOL Anxiety item bank and linkage with GAD-7. *Journal of Spinal Cord Medicine*, 38(3) 315-325.

Kisala PA, Victorson D, Pace N, **Heinemann AW**, Choi SW, Tulsy DS. Measuring psychological trauma after spinal cord injury: Development and psychometric characteristics of the SCI-QOL Psychological Trauma item bank and short form. *Journal of Spinal Cord Medicine*, 38(3) 326-334.

Tulsy DS, Kisala PA, Kalpakjian CZ, Bombardier CH, Pohlig RT, **Heinemann AW**, Carle A, Choi SW. Measuring depression after spinal cord injury: Development and psychometric characteristics of the SCI-QOL Depression item bank and linkage with PHQ-9. *Journal of Spinal Cord Medicine*, 38(3) 335-346.

Kisala PA, Tulsy DS, Pace N, Victorson D, Choi SW, **Heinemann AW**. Measuring stigma after spinal cord injury: Development and psychometric properties of the SCI-QOL Stigma item bank and short form. *Journal of Spinal Cord Medicine*, 38(3) 377-385.

Jette AM, Slavin MD, Ni P, Kisala PA, Tulsy DS, **Heinemann AW**, Charlifue S, Tate DG, Fyffe D, Morse L, Marino R, Smith I, Williams S. Development and initial evaluation of the SCI-FI/AT. *Journal of Spinal Cord Medicine*, 38(3) 409-418.

McCullumsmith CB, Kalpakjian CZ, Richards JS, Forchheimer M, **Heinemann AW**, Richardson EJ, Wilson CS, Barber J, Temkin N, Bombardier, CH, Fann JR. Novel Risk Factors Associated With Current Suicidal Ideation and Lifetime Suicide Attempts in Individuals with Spinal Cord Injury. *Arch Phys Med Rehabil*, 95(5), 799-808, 2015.

Seel RT, Macciocchi SN, Velozo CA, Shari K, Thompson N, Sander A, **Heinemann AW**, Sleet D. The Safety Assessment Measure for Persons with Traumatic Brain Injury: Item Pool Development and Content Validity. *Neurorehabilitation*. (in press).

Kozlowski AJ, Singh R, Victorson D, Miskovic A, Lai JS, Harvey RL, Cella D, **Heinemann AW**. Agreement between responses from community-dwelling persons with stroke and their proxies on the NIH Neurological Quality of Life (Neuro-QoL) Short Forms. *Arch Phys Med Rehabil*, in press.

Presentations

Burger E, Hermansson L, **Heinemann AW**. Development of the Orthotic Prosthetic Users' Survey - Upper Extremity Functional Status module version 3.0. Paper presented at the International Society of Prosthetics Orthotics World Congress, Lyon, France, June 2015.

Kirby RL, Worobey LA, Cowan R, Presperin J, Pedersen J, **Heinemann AW**, Dyson-Hudson T, Shea M, Smith C, Rushton PR, Boninger ML. Relationship between the total percentage scores on the WST-Q and objective versions of the Wheelchair Skills Test for manual

wheelchair users with SCI. Poster presented at the Rehabilitation Engineering and Assistive Technology Society of North America Annual Meeting, Denver, CO, June 13-15, 2015.

Heinemann AW, Chan L. Improving the Quality of Rehabilitation Research Through the Use of Reporting Guidelines. Paper presented at the 9th World Congress of the International Society of Physical and Rehabilitation Medicine, Berlin, Germany, June 20, 2015

Grant submitted

Craig H. Neilsen Foundation: Implementing SCI-QOL into Clinical Practice: Enhancing Patient Outcomes using Common Data Elements and Implementation Science

NIDILRR, RRTC on Improving Measurement of Home and Community Based Services

NIDILRR, DRRP: Knowledge Translation to Promote Use of Standardized Clinical Assessments

Professional Service

Expert Panel Member, American Physical Therapy Association's Clinical Practice Guideline Panel: Core Set of Outcome Measures for Patients with Neurologic Conditions. May, 2014-December, 2016.

Member, Institute of Medicine Standing Committee on Medical Experts to Assist Social Security on Disability Issues, 2014- present

Christina Marciniak:

Publications

Marciniak CM, Li X, Zhou P. An Examination of Motor Unit Number Index in Adults with Cerebral Palsy. *J of Electromyography and Kinesiology*. 2015 25(3), 444-450.PMID: 25840713

Klein CS, Zhou P, **Marciniak C**. Excitability properties of motor axons in adults with cerebral palsy. *Frontiers in Neuroscience*. *Accepted for Publication*

McCormick Z, Cushman D, Caldwell M, Marshall B, Ghannad L, Eng C, Patel J, Makovitch S, Chu SK, Babu AN, Walega DR, **Marciniak C**, Press J, Kennedy DJ, Plastaras C. Does Electrodiagnostic Confirmation of Radiculopathy Predict Pain Reduction after Transforaminal Epidural Steroid Injection? A Multicenter Study. *Journal of Nature and Science*, 2015,1(8):e140.

Elovic, Elie Paul, Michael C. Munin, Petr Kaňovský, Angelika Hanschmann, Reinhard Hiersemenzel, and **Christina Marciniak**. "Randomized, placebo-controlled trial of incobotulinumtoxinA for upper-limb post-stroke spasticity." *Muscle & Nerve* (2015).**Accepted for publication**

Abstracts

Brashear A, **Marciniak C**, Edgley S, Gul F, Hedera P, McAllister P, O'Dell M, et al. "A Phase III randomized, double-blind, placebo-controlled study to assess the efficacy and safety of

abobotulinumtoxinA (Dysport®) in adults with upper limb spasticity (S28. 001)." *Neurology* 84, no. 14 Supplement (2015): S28-0

Sethi K Elovic E, Munin M, **Marciniak C**, Hiersemenzel R, and Hanschmann A. "Topline results from a randomized, placebo-controlled, Phase III study investigating the safety and efficacy of incobotulinumtoxinA in treating post-stroke spasticity of the upper limb (S28. 002)." *Neurology* 84, no. 14 Supplement (2015): S28-002.

Debjani Mukherjee:

Mukherjee D. Recognizing Psychological Diversity in People with End-Stage Amyotrophic Lateral Sclerosis. *AMA Journal of Ethics*. 2015; 17:530-534. <http://journalofethics.ama-assn.org/2015/06/nlit2-1506.html>.

Levine, C., Hoffman, JM, Byron, J, Arnold, R, Kondrat A. & **Mukherjee, D.** Surrogate Decision Making and Truth Telling in a Rehabilitation Case. *PM&R: The journal of injury, function and rehabilitation* 2015 Jul;7(7):762-9. doi: 10.1016/j.pmrj.2015.05.021 [Ethics Legal Column Feature Editor]

Monica Rho:

Cushman DM, **Rho M.** Conservative treatment of subacute proximal hamstring tendinopathy using eccentric exercises performed with a treadmill: a case report. *J Orthop Sports Phys Ther*. 2015 Jul; 45(7): 557-62.

Loveless M, **Rho ME.** Buttock pain and weakness - Runner. *Selected for oral presentation at the American College of Sports Medicine Annual Meeting, San Diego, CA.* May 29, 2015

Ziegler C, **Rho M,** Press J. Groin pain – Marathon running. *Selected for oral presentation at the American College of Sports Medicine Annual Meeting, San Diego, CA.* May 29, 2015

Dubon M, **Rho M.** Back pain – Adolescent runner. *Selected for oral presentation at the American College of Sports Medicine Annual Meeting, San Diego, CA.* May 29, 2015

Selected as a 2015-2017 Academy Leadership Program Fellow of the AAPMR.

Leslie Rydberg:

Lynch, M. McCormick, Z. Liem, B. Jacobs, G. Hwang, P. Hornby, TG. **Rydberg, L.** Roth, EJ. Energy cost of lower body dressing, pop-over transfers, and manual wheelchair propulsion in people with paraplegia due to motor-complete spinal cord injury. *Topics in Spinal Cord Injury Rehabilitation*. 2015;21(2):140-148.

Ming Wu:

Yen, S., Schmit, B.D., **Wu, M.** Using swing resistance and assistance to improve gait symmetry in patients post stroke, *Human Movement Science*, 2015, 42, 212-224.

Grant Award: NIH/NICHHD, RO1HD082216, "Constraint induced movement therapy for walking in individuals post stroke". 08/06/2015-07/30/2020

W. Zev Rymer:

Liu J, Ying D, **Rymer WZ**, Zhou P published “Robust muscle activity onset detection using an unsupervised electromyogram learning framework” in *PLoS One*.

Co-Chair for an abstract session at ISB – Session on Rehabilitation: Balance 1 in Glasgow, Scotland, July 2015

Chair for symposium on Impaired Motor Control and Rehabilitation at 10th meeting of the International Society of Motor Control in Budapest, Hungary, July 25

Presenting “Spinal control of movement and force” at RIC-IIT Workshop on Robotic and Interactive Technologies for Neuroscience and Neurorehabilitation in Arenzano, Italy, August 31

Research Faculty

Linda Ehrlich-Jones:

Peer reviewed publications

Song J, Lindquist LA, Chang RW, Semanik PA, **Ehrlich-Jones LS**, Lee J, Sohn, M-W, & Dunlop DD. (2015). Sedentary behavior as a risk factor for physical frailty independent of moderate activity: Results from the Osteoarthritis Initiative. *American Journal of Public Health*, 105, 1439-1445.

Grants submitted

NIDILRR DRRP on Knowledge Translation Heinemann/Ehrlich-Jones (Principal Investigators). Knowledge Translation to Promote Use of Standardized Clinical Assessments.

Craig H. Neilsen Psychosocial Research Grant Ehrlich-Jones (Principal Investigator)

Pilot Study on Training Therapists in Motivational Interviewing to Enhance Rehabilitation Participation

Grants in development

NIH/NIAMS U01Ehrlich-Jones/Ramsey-Goldman (Principal Investigators)

Activity and Nutrition Trial in Lupus to Energize and Renew (ANTLER)

Ongoing service

Chair WFO, Northwestern University

Rheumatology Research Foundation, Member, Board of Directors

Anne Deutsch

Presentations

Deutsch A. Quality Measures for Inpatient Rehabilitation Facilities. Rise Above: Reaching Peak Performance; 2015 Rehabilitation & Respiratory Care Annual Conference. Scottsdale, AZ. June 9th, 2015.

Ongoing service

Dissertation committee member for Amit Kumar, OT. Doctoral Student, University of Texas Medical Branch, Dissertation: Comorbidities and Functional Outcomes, Successfully defended dissertation July 14, 2015

Dissertation committee member for Laura Coats. Doctoral Student, Brandeis University, Dissertation: Readmissions after Discharge from an Inpatient Rehabilitation Facility, Proposal Defense on June 30, 2015

Policy:

Under a CMS contract, Anne led the development of a cross-setting functional status quality measure that were finalized for use in three of CMS' quality reporting program with data collection starting October 1, 2016, including the Inpatient Rehabilitation Facility Quality Reporting Program (<https://www.federalregister.gov/articles/2015/08/06/2015-18973/medicare-program-inpatient-rehabilitation-facility-prospective-payment-system-for-federal-fiscal>), the Long-term Care Hospital Quality Reporting Program (<https://www.federalregister.gov/articles/2015/08/17/2015-19049/medicare-program-hospital-inpatient-prospective-payment-systems-for-acute-care-hospitals-and-the>) and the Skilled Nursing Facility Quality Reporting Program (<https://www.federalregister.gov/articles/2015/08/04/2015-18950/medicare-program-prospective-payment-system-and-consolidated-billing-for-skilled-nursing-facilities>).

- Under a CMS contract, Anne led the development of four outcome functional status quality measures that were finalized for use in the Inpatient Rehabilitation Facility Quality Reporting Program (<https://www.federalregister.gov/articles/2015/08/06/2015-18973/medicare-program-inpatient-rehabilitation-facility-prospective-payment-system-for-federal-fiscal>),
- Under several CMS contracts and an ASPE contract, Anne led the development of 4 quality measures that are now endorsed by NQF (July 23, 2015):
 - Percent of Long-Term Care Hospital (LTCH) Patients With an Admission and Discharge Functional Assessment and a Care Plan That Addresses Function; *STEWARDS*: Centers for Medicare & Medicaid Services (CMS) - <http://www.qualityforum.org/QPS/2631>
 - Long-Term Care Hospital (LTCH) Functional Outcome Measure: Change in Mobility Among Patients Requiring Ventilator Support; *STEWARDS*: Centers for Medicare & Medicaid Services (CMS) - <http://www.qualityforum.org/QPS/2632>
 - Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Self-Care Score for Medical Rehabilitation Patients; *STEWARDS*: Centers for Medicare & Medicaid Services (CMS) - <http://www.qualityforum.org/QPS/2635>
 - Inpatient Rehabilitation Facility (IRF) Functional Outcome Measure: Discharge Mobility Score for Medical Rehabilitation Patients; *STEWARDS*: Centers for Medicare & Medicaid Services (CMS) - <http://www.qualityforum.org/QPS/2636>

Other Faculty

Ross Arena:

Publications:

- Colbert JD, Martin BJ, Haykowsky MJ, Hauer TL, Austford LD, Arena R, Knudtson ML, Meldrum DA, Aggarwal MD, Stone JA. Cardiac rehabilitation referral, attendance and mortality in women. *European Journal of Preventive Cardiology*. 2015;22:979-986.
- Loyaga-Rendon R, Plaisance E, Arena R, Shah K. Exercise physiology, testing and training: considerations for heart failure patients supported by left ventricular assist device. *Journal of Heart and Lung Transplantation*. 2015;34:1005-1016.
- Lavie CJ, Arena R, Swift DL, Johannsen NM, Xui X, Duck-Chui L, Earnest CP, Church TS, O'Keefe JH, Milani RV, Blair SN. Exercise and the cardiovascular system: clinical science and cardiovascular outcomes. *Circulation Research*. 2015;117:207-219.
- Van Tassel BW, Raleigh JV, Oddi C, Carbone S, Canada J, Abouzaki NA, Biondi-Zoccai G, Arena R, Abbate A. Interleukin-1 blockade in recently decompensated systolic heart failure: study design of the recently decompensated heart failure Anakinra response trial (RED-HART). *Journal of Clinical Trials in Cardiology*. 2015;2:1-8.
- Simoes-Castello V, Minatel V, Karsten M, Simoes R, Perseguini N, Milan J, Arena R, Neves L, Borghi-Silva A, Catai A. Circulatory and ventilatory power: characterization of novel cardiopulmonary exercise testing measures in patients with coronary artery disease. *Arquivos Brasileiros de Cardiologia*. 2015;104:476-485.
- Cahalin LP, Kaminsky L, Lavie CJ, Briggs P, Cahalin BL, Myers J, Forman DE, Patel M, Pinkstaff SO, Arena R. Development and implementation of a worksite health and wellness program: A focus on non-communicable disease. *Progress in Cardiovascular Disease*. 2015;58_94-101.
- Myers J, Arena R, Cahalin LP, Labate V, Guazzi M. Cardiopulmonary exercise testing in heart failure. *Current Problems in Cardiology*. 2015;40:322-372.
- Caruso FR, Arena R, Phillips SA, Bonjorno Jr JC, Mendes RG, Arakelian VM, Bassi D, Nogi C, Borghi-Silva A. Resistance exercise training improves heart rate variability and muscle performance: A randomized controlled trial in coronary artery disease patients. *European Journal of Physical and Rehabilitation Medicine*. 2015;51:281-289.
- Lounsbury P, Elokda AS, Gylten D, Arena R, Clarke W, Gordon EE. Text-messaging program improved outcomes in cardiovascular rehabilitation. *International Journal of Cardiology: Heart and Vasculature*. 2015;7:170-175.

- Jurgensen SP, Trimer R, Dourado VZ, Thommazo-Luporini L, Bonjorno Jr JC, Olioveira CR, Arena R, Mendes RG, Borghi-Silva A. Shuttle walk test in obese women: test-retest reliability and concurrent validity with peak oxygen uptake. *Clinical Physiology and Functional Imaging*. 2015;35:120-126.
- Pescatello LS, MacDonald HV, Ash GI, Lamberti LM, Farquhar WB, Arena R, Johnson BT. Assessing the existing professional exercise recommendations for hypertension: A review and recommendations for future research priorities. *Mayo Clinic Proceedings*. 2015;90:801-812.

Presentations:

- Host: Physical Education in Schools. AHA Webinar Series. Chicago, IL, July 2015.
- Cardiac Rehabilitation: State of Evidence, Current Practice Patterns and the Future. Cardiology Grand Rounds. John H Stroger Jr. Hospital of Cook County, Chicago, IL, July 2015.
- Addressing the non-communicable disease Epidemic through worksite health and wellness programs. XXXVI Congress of the Sao Paulo State Society of Cardiology, XXI Physical Therapy Symposium, Sao Paolo, Brazil, June 2015.
- Revisiting CPX Applications: Aligning Evidence with Clinical Practice. XXXVI Congress of the Sao Paulo State Society of Cardiology, XXI Physical Therapy Symposium, Sao Paolo, Brazil, June 2015.

Marylou Guihan:

Proposals Submitted:

Guihan (PI), Neilsen Foundation Pilot Psychosocial Research Grants, "Developing patient-centered interventions to improve wound care outcomes in SCI"

Safdar (PI), VA RR&D, "Alternative Therapies for wound Healing in Diabetes (ATHENA)", role: Co-investigator

Evans (PI) VA HSR&D, Spinal Cord Injury Program for Evaluation of Best Practices (SCIPE-BP)
Role: Co-investigator

Rubin (PI), VA HSR&D Combating Antimicrobial Resistance through Rapid Implementation of Available Guidelines and Evidence (CARRIAGE), Role: Co-investigator

Carbone and Weaver (PIs) VA HSR&D, Management of osteoporotic fractures in Veterans with Spinal Cord Injury, Role: Co-investigator.

Guihan (PI), VA HSR&D Improving Skin Health in SCI Outpatients by Implementing a Checklist"

Presentations:

PVA Summit, Jacksonville, FL 8/31/15: "Describing Veterans with Multiple Sclerosis Receiving Nursing Home Care," Marylou Guihan, PhD; Florian Thomas, MD, MA, PhD; Zhipeng (Jenny) Huo, MS; Orna Intrator, Ph.D.

PVA Summit, Jacksonville, FL 8/31/15: "A Pilot study to evaluate the Role of the Spinal Cord Injury Pressure Ulcer Monitoring Tool (SCI-PUMT) in Clinical Decisions for Pressure Ulcer Treatment" Marylou Guihan, PhD; Susan S. Thomason DNP, RN

ASCIP, New Orleans, 9/8/15, Ethics in Research – Give Credit Where Credit is Due: Jenny Kiratli; Maggi Budd; Shirley Groer; Marylou Guihan

Rosemarie King: Manuscript reviewer: *Stroke*

Maria Knikou:

Knikou M, Dixon L, Santora D, Ibrahim MM (2015) Transspinal constant current long-lasting stimulation: A new method to induce cortical and corticospinal plasticity. *Journal of Neurophysiology* doi:10.1152/jn.00449.2015, published online on 24th June 2015.

Mackey AS, Uttaro D, McDonough MP, Krivis LI, **Knikou M** (2015) Convergence of flexor reflex and corticospinal inputs on tibialis anterior network in humans. *Clinical Neurophysiology* doi: 10.1016/j.clinph.2015.06.011, published online on 18th June 2015.

Diane Dudas Sheehan:

Presentations:

May 26, 2015 and 4/7/15 "Normal Growth and Development" PM&R residents on Pediatric rotation at the Rehabilitation Institute of Chicago

June 16, 2015 and 4/21/15 "Neuromuscular Scoliosis Evaluation and Management" PM&R residents on Pediatric rotation at the Rehabilitation Institute of Chicago

Other:

Continue to serve as Chair of the APN Publication committee at Lurie Children's

Member of the NU Women Faculty Organization (WFO) Steering committee

Northwestern University Prosthetics and Orthotics Center

Publications:

Caldwell R, Hansen A, Wood S, Chen W, Radcliffe R, Yngve K, Kuhar B, Nelson AJ, Nickel E. Vacuum Pump Systems for Prosthetic Limbs and Methods of Using the Same. United States Patent 9,066,822. Issued on June 30, 2015.

Bjornson K, Zhou C, **Fatone S**, Orendurff M, Rashid S, Stevenson R (in press) Community walking activity in cerebral palsy: do orthoses help? *Pediatric Physical Therapy*.

Major M, Caldwell R, Fatone S (in press) Comparative effectiveness of electric vacuum pumps for creating suspension in transfemoral sockets. *Journal of Prosthetics and Orthotics*.

Presentations:

Stefania Fatone, PhD, BPO (Hons), presented the Principal Investigator Perspective as part of a panel on “Navigating the Research Enterprise” on June 1, 2015. This series is a joint venture of the Faculty Affairs Office, Feinberg School of Medicine, and the NUCATS Institute providing an introduction to important aspects of transitioning from researcher-in-training to investigator leading a research team or collaborating with peers.

Boutwell E, Stine R, Gard S (2015). Influence of Longitudinal Prosthetic Stiffness Modification on Ground Reaction Forces during Transtibial Gait. The 15th World Congress of the International Society of Prosthetics and Orthotics (ISPO), held in Lyon, France, June 22-25.

Boutwell E, Stine R, Gard S (2015). Influence of Longitudinal Stiffness Modification on Impact Forces within the Transtibial Prosthesis. The 15th World Congress of the International Society of Prosthetics and Orthotics (ISPO), held in Lyon, France, June 22-25.

Fatone S. and Caldwell R. (2015) Northwestern University Flexible Subishial Vacuum Socket (NU-FlexSIV). Instructional Course, 15th World Congress of the International Society for Prosthetics and Orthotics, June 22-25, Lyon, France.

Fatone S, Stine R, Dillon M (2015) Pelvic and Spinal Motion during Walking in Persons with Transfemoral Amputation with and without Low Back Pain. World Congress of the International Society for Prosthetics and Orthotics, June 22-25, Lyon, France.

Fatone S, Dillon M, Stine R, Tillges R (2015) Coronal plane socket stability during gait in persons with transfemoral amputation: Pilot study. 15th World Congress of the International Society for Prosthetics and Orthotics, June 22-25, Lyon, France.

Fatone S, McGovern D, Clancy T, Conaway P, Quigley M, Gaebler-Spira D (2015) Effect of two orthotic approaches on activity level, balance & satisfaction in children with cerebral palsy (poster). 15th World Congress of the International Society for Prosthetics and Orthotics, June 22-25, Lyon, France.

Gard SA, Nepomuceno T, Major M, Stine R (2015). Effect of Ankle Immobilization on Able-Bodied Gait to Model Bilateral Transtibial Amputee Gait. The 15th World Congress of the International Society of Prosthetics and Orthotics (ISPO), held in Lyon, France, June 22-25.

Gard SA, Major M, Johnson W (2015). Mechanical Characteristics of Prosthetic Feet: Forefoot Stiffness and Damping. The 15th World Congress of the International Society of Prosthetics and Orthotics (ISPO), held in Lyon, France, June 22-25.

Gard SA (2015). Sensitivity of Biomechanical Gait Outcomes to Component-Specific Changes in Prosthesis Properties. The 15th World Congress of the International Society of Prosthetics and Orthotics (ISPO), held in Lyon, France, June 22-25.

Hansen A, Owen E, **Fatone S.** (2015) From Stable Standing to “Rock’nRoll Walking with Prostheses and Orthoses. 15th World Congress of the International Society for Prosthetics and Orthotics, June 22-25, Lyon, France.

Ramstrand N, Hafner B, Dillon M, **Fatone S** (2015) Applications of best available evidence in O&P: what can we learn from systematic reviews? 15th World Congress of the International Society for Prosthetics and Orthotics, June 22-25, Lyon, France.

Major M. (2015) Exploring the relationship between lower-limb prosthesis mechanical properties and user performance for clinical prescription and prosthesis design optimization. Symposium (Chair), 15th World Congress of the International Society for Prosthetics and Orthotics, June 22-25, Lyon, France.

Major M. (2015) Amputee Independent Prosthesis Properties: Mechanical characterization for functional classification to facilitate systematic research and clinical prescription. 15th World Congress of the International Society for Prosthetics and Orthotics, June 22-25, Lyon, France.

Borrenpohl D, Major MJ. A Survey-Based Investigation of the Role of Outcome Measures in the Assignment of Medicare Functional Classification Level for Persons with Lower Limb Amputation. 15th World Congress of the International Society of Prosthetics and Orthotics, Lyon, France, June 22 - 25, 2015.

Vendeville K, Major MJ. Prediction of Frequent Fallers Amongst Lower Limb Prosthesis Users and Effects of Mobility Aid Use on Mobility and Balance Performance. 15th World Congress of the International Society of Prosthetics and Orthotics, Lyon, France, June 22 - 25, 2015.

Sletto, L., **Wu, Y., Robinson, C.** (2015) Dilatancy-based, plaster-less system for fabricating ankle-foot orthoses. 15th World Congress of the International Society for Prosthetics and Orthotics, June 22-25, Lyon, France.

Wu, Y., Sletto, L., Robinson, C. (2015) Dilatancy TLSO System for Fabricating Thoraco-Lumbar-Sacral Orthoses. 15th World Congress of the International Society for Prosthetics and Orthotics, June 22-25, Lyon, France.

Wu, Y. (2015) Case Report: Stump care and Prosthetic Fitting of a Transfemoral Residual Limb with a Large Open Wound. 15th World Congress of the International Society for Prosthetics and Orthotics, June 22-25, Lyon, France.

Fatone S, Huang Y, Rogers J, Coleman T, **Tran L** (2015) Interface Monitoring System to Promote Residual Limb Health. Ignite Talk at the 2015 NSF Smart and Connected Health (SCH) Principal Investigators Workshop: Amplifying Discovery through Shared Resources and Defining and Measuring Health Impact in SCH Research, June 30-July 1, 2015, Arlington, VA.

Fatone S, Huang Y, Coleman T, Rogers J, Banks A, **Tran L, Caldwell R**, Brown D, Pharr M (2015) Interface Monitoring System to Promote Residual Limb Health (poster). 2015 NSF Smart and Connected Health (SCH) Principal Investigators Workshop: Amplifying Discovery through Shared Resources and Defining and Measuring Health Impact in SCH Research, June 30-July 1, 2015, Arlington, VA.

Meetings:

Stefania Fatone, PhD, was interviewed by Kristoff Husted for KBIA Mid-Missouri Public Radio. "Amputee Farmers Struggle with Available Prosthetics" aired on 6/3/2015.

Matthew Major, PhD, presented "Rehabilitation Engineering Research at the Northwestern University Prosthetics-Orthotics Center for Education and Research" at the University of Salford (Manchester, UK) on July 2, 2015. He addressed the Centre for Health Sciences Research, which includes faculty and graduate students of the School of Health Sciences, and the School of Computing, Science, and Engineering. Following his talk, Dr. Major participated in several meetings to discuss ongoing and future collaborative projects.

Matthew Major, PhD, attended the 2015 Annual Student-Faculty Retreat as a faculty participant and served as a poster judge at the Medical Scientist Training Program (MSTP) on July 10-12, 2015 in Chicago, IL and Delavan, WI. The purpose of the retreat was to welcome new MD/PhD students into the program and to allow other students to present their doctoral research.

Stefania Fatone, PhD, was invited to participate as a reviewer in the VA RR&D's Scientific Merit Review Board Meeting held on August 4, 2015, in Washington DC.

Stefania Fatone, PhD, participated as on the review committee for the best oral presentation in the category advancing clinical treatment at the 15th World Congress of the International Society for Prosthetics and Orthotics, June 22-25, Lyon, France.

Stefania Fatone, PhD, BPO (Hons), is currently involved as a member of the Clinical Content Committee planning the 2016 American Academy of Orthotists and Prosthetists Annual Meeting and Scientific Symposium.

Lily Tran, MS, attended the 2015 NSF Smart and Connected Health (SCH) Principal Investigators Workshop held June 30-July 1, 2015 in Arlington, VA. Lilly attended on behalf of **Stefania Fatone, PhD** (PI) of the NIH funded project "Interface Monitoring System to Promote Residual Limb Health".

Matthew Major, PhD, was invited to participate as a reviewer for the National Institutes of Health Small Business Innovation Research Award "Improving Health through Rehabilitation Robotic Technology (R43/R44)"

Steven Gard, PhD, participated as a reviewer in the VA RR&D's Career Development Award Review Panel Meeting held on August 5, 2015, in Washington DC.

Laboratory Visits/Events:

The **Northwestern University Prosthetics-Orthotics Center (NUPOC)** held the “NU-FlexSIV Socket Course” (July 31-August 1 and August 21-22, 2015), the first two of a series of three hands-on continuing education courses for Certified Prosthetists. These courses were supported by a grant from the Department of Defense (**PI: Stefania Fatone, PhD**) and were taught by **Stefania Fatone, PhD**, and **Ryan Caldwell, CP/L. R. J. Garrick, PhD**, was registrar and course manager.

The **Northwestern University Prosthetics-Orthotics Center (NUPOC)** hosted two educational programs and site visits for the National Student Leadership Conference (NSLC) on August 11 and 12, 2015. **R. J. Garrick, PhD**, developed and managed these STEM programs.

Grant Awards:

Stefania Fatone, PhD, was awarded funding by the American Orthotic and Prosthetic Association as a co-investigator on “Evaluating outcomes of dysvascular partial foot and transtibial amputation: a systematic review and development of shared decision making resources” (PI: Michael Dillon, PhD, La Trobe University).

Grant Submissions:

Stefania Fatone, PhD, was invited to submit an application titled “No longer smooth: introducing striations into prosthetic socket construction to improve suspension, rotation, fit and comfort” to the Department of Defense on August 17, 2015 in response to the FY15 CDMRP Clinical and Rehabilitative Medicine Research Program (CRM RP) Neuromusculoskeletal Injuries Research Award.

Stefania Fatone, PhD, was a co-investigator on a National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR) DRRP application titled “Knowledge Translation to promote Use of Standardized Clinical Assessments” submitted on July 6, 2015, with Allen Heinemann (PI).

Stefania Fatone, PhD, was sub-contract PI on a Defense Health Program SBIR Phase II application titled “iGRAB: Innovative Glove for Rehabilitation and Assistance using Biomimicry” submitted on June 16, 2015, with Anjal Sharma (PI) from Lynntech Inc.

Steven Gard, PhD, submitted a proposal entitled, “Optimization of Prosthetic Foot and Ankle Stiffness for Standing and Walking” to the Department of Veterans Affairs, Rehabilitation Research & Development Service, on June 10, 2015.

Steven Gard, PhD, and **Yeongchi Wu, MD**, submitted a proposal entitled, “Refinement and Evaluation of Improved Method for Transfemoral Socket Fabrication” to the Department of Veterans Affairs, Rehabilitation Research & Development Service, on June 10, 2015.

Steven Gard, PhD, was a co-investigator on an application entitled, “Smart Prosthetic Interface Controlled by Feedback from Residual Limb Muscle Activity” that was submitted by Noah Rosenblatt, PhD (PI) to the Department of Defense on August 17, 2015 in response to the

FY15 CDMRP Clinical and Rehabilitative Medicine Research Program (CRMRP) Neuromusculoskeletal Injuries Research Award.

Matthew Major, PhD, submitted an application titled “Rugged, Low-Cost, Purely Mechanical Prosthetic Knees Optimized to Replicate Physiological Gait for a Variety of Terrains and Cadences” to the Department of Defense on August 17, 2015 in response to the FY15 CDMRP Clinical Rehabilitative Medicine Research Program (CRMRP) Neuromusculoskeletal Injuries Research Award.

Matthew Major, PhD, was listed as a co-investigator on an NSF Career Award titled “High performance, low-cost, passive prosthetic knees optimized to replicate physiological gait in multiple mobility scenarios” submitted July 31st, 2015.

Letters of Intent:

Stefania Fatone, PhD, submitted an LOI on June 1, 2015 to the Department of Defense titled “No longer smooth: introducing striations into prosthetic socket construction to improve suspension, rotation, fit and comfort.”

Steven Gard, PhD, submitted a pre-application entitled, “Development and Evaluation of a Shock Absorbing Prosthetic Ankle Mechanism” to the Department of Defense Peer Reviewed Orthopaedic Research Program on August 13, 2015.

Matthew Major, PhD, submitted an LOI on August 3rd, 2015 to the Department of Veterans Affairs titled “Design of a Low-Cost Prosthetic Foot with Physiological Roll-Over and Push-Off.”

Center for Bionic Medicine (RIC)

Awards:

Hargrove LJ, Simon AM, Young A, Finucane S, Halsne E, Fey N, Ingraham K, and **Kuiken TA**, were awarded the 2015 US Army’s Military Health System Research Symposium TEAM Award for Outstanding Research Accomplishment by Academic collaborators.

Simon AM “Improved weight-bearing symmetry for transfemoral amputees during standing up and sitting down with a powered knee-ankle prosthesis.” RIC’s Sarah Baskin Research Award—1st Place, Faculty Category

Webinar:

Hargrove LJ. “*Control of Bionic Limbs: Development of a Neural Interface for Lower Limb Prostheses*”, July 14, 2015.

Workshop:

Rouse, E. Workshop leader, for U.S. Special Operations Command: “*TALOS exoskeleton control theory sprint*” Tampa, FL. Rouse, July 19-22

Papers

Yao J, Chen A, **Kuiken TA**, Carmona C and Dewald J. Sensory Cortical Re-mapping following Upper-limb Amputation and Subsequent Targeted Reinnervation: A Case Report. *NeuroImage*, 8, 329-336. E Pub. Jan. 20, 2015. doi:10.1016/j.neuroimage.2015.01.010

Hargrove LJ, Young AJ, **Simon AM**, Fey NP, Lipschutz RD, Finucane SB, Halsne EG, Ingraham KA, **Kuiken TA**. Intuitive Control of a Powered Prosthetic Leg during Ambulation: A Randomized Clinical Trial. *JAMA*; 313(22):2244-2252, June 9, 2015. doi:10.1001/jama.2015.4527

Krausz N, Lenzi T, and **Hargrove LJ**. "Depth Sensing for Improved Control of Lower Limb Prostheses", *IEEE Transactions on Biomedical Engineering*, Epub ahead of print, June 2015. DOI:[10.1109/TBME.2015.2448457](https://doi.org/10.1109/TBME.2015.2448457)

Buesing C, Fisch G, O'Donnell M, Shahidi I, Thomas L, Mummidisetty C, Williams K, Takahashi H, Rymer W, **Jayaraman A**. "Effects of a wearable exoskeleton stride management assist system (SMA) on spatiotemporal gait characteristics in individuals after stroke: a randomized controlled trial." *Journal of NeuroEngineering and Rehabilitation*, 12:69, August 2015. doi: 10.1186/s12984-015-0062-0

Smith L, **Kuiken TA**, and **Hargrove LJ**. "Evaluation of linear regression simultaneous myoelectric control using intramuscular EMG", *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, Accepted.

Invited Talks

Kuiken, TA. Building Bionics for kids too. Association of Children's Prosthetic-Orthotic Clinics, Clearwater Florida, May 15, 2015

Hargrove LJ, "Recent advances in Bionic Medicine: Development of a Neural Interface for Lower Limb Prostheses", Shanghai Symposium on Neural-Machine Interfacing, June 2015, [Shanghai, China](#)

Conference Presentations:

Kuiken TA, **Miller L**, and Turner, K. *A comparison of Direct Control and Pattern Recognition Control in Transhumeral TMR subjects*, International Society for Prosthetic and Orthotics (ISPO), June 22-25 2015, Lyon, France.

Kuiken TA, Turner K., Soltys N, Dumanian G. *First Clinical Fitting of an Individual After Bilateral TMR With Pattern Recognition Control*. International Society for Prosthetic and Orthotics (ISPO), June 22-25 2015, Lyon, France.

Reissman T, Halsne E, **Kuiken TA**. *Clinical Evaluation of a Novel Gel Liner System Developed to Improve Use and Function of Transhumeral Myoelectric Prostheses*. International Society for Prosthetic and Orthotics (ISPO), June 22-25 2015, Lyon, France.

Jayaraman A., Deems-Dluhy S, Lonini L, Hoppe-Ludwig Shenan. *Micro-processor controlled Knee-Ankle-Foot Orthosis (C-Brace) vs. Stance-control Knee-Ankle-Foot Orthosis (SCO) and conventional Knee-Ankle-Foot Orthosis (KAFO): Functional Outcomes in Individuals with Lower Extremity Impairments due to Neurologic or Neuromuscular Disease, Orthopedic Disease or Trauma*. International Society for Prosthetic and Orthotics (ISPO), June 22-25 2015, Lyon, France.

Lenzi T, Sensinger JW, Lipsey J, **Hargrove LJ, Kuiken TA** "Design and Preliminary Testing of the RIC Hybrid Knee Prosthesis" 37th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, August 25-29 2015, Milan, Italy.

Lenzi T., Sensinger JW, Lipsey J, **Hargrove LJ, Kuiken TA.** (Poster presentation) "The RIC hybrid knee prosthesis" IEEE International Conference on Robotics and Automation (ICRA), May 26-30 2015, Seattle, WA

Spanias J, **Simon AM**, Ingraham KA, and **Hargrove LJ**, "Effect of additional mechanical sensor data on an EMG-based pattern recognition system for a powered leg prosthesis," presented at the 7th International IEEE EMBS Neural Engineering Conference, April 22-24 2015, Montpellier, France

Grants submitted

NIH R21 (NINDS / NICHD) **Rouse, E** 'Quantifying Leg Multi-Joint Impedance During Human Walking', June 16, 2015.

NIH R13 Conference Grant **Kuiken, TA** 'First World Congress on Innovations in Amputation Surgery and Prostheses' August 12, 2015.

DOD CDMRP Spinal Cord Injury Research Program. Translational Research Award, **Jayaraman, A**, Letter of intent submitted July 13, 2015.