

Scholarly Activities
Department of Physical Medicine and Rehabilitation
June – August 2016

REGULAR FACULTY

Brenna Argall

A. Broad, J. Schultz, M. Derry, T. Murphey and **B. Argall**. Trust Adaptation Leads to Lower Control Effort in Shared Control of Crane Automation. *IEEE Robotics and Automation Letters*, in press. This article also will be presented at the IEEE Conference on Automation Science and Engineering (CASE), Fort Worth, Texas, USA, August 2016.

D. Gopinath, S. Jain and **B. Argall**. Human-in-the-Loop Customization of Shared Autonomy in Assistive Robotics. *IEEE Robotics and Automation Letters*, in press. This article also will be presented at the IEEE Conference on Automation Science and Engineering (CASE), Fort Worth, Texas, USA, August 2016.

M. Nejadi and **B. Argall**. Automated Incline and Drop-off Detection for Assistive Powered Wheelchairs. In Proceedings of the IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN), New York, New York, USA, Aug. 2016. (Publication and oral presentation at RO-MAN.)

Chih-Hung Chang

Abstracts

Julia Carpenter, Jennifer Moore, Carey Holleran, Piper Hansen, Jana Ellison, **Chih-Hung Chang**. *Selection & Pilot of a Core Battery of Standardized Assessments for Inpatient Rehabilitation*. Seminar session to be presented at the 2016 ASHA Convention.

Valerie Blouch, Laura Pitts, **Chih-Hung Chang**, Rene Ruzicka, Anne Marie Doyle, Matthew Oswald, Lynn Vidakovic. *Exploring Clinical Power Tests as Outcome Measures in Dysphagia*. Poster session to be presented at the 2016 ASHA Convention.

Publication

Gordon EJ, Sohn MW, **Chang CH**, McNatt G, Vera K, Beauvais N, Warren E, Mannon RB, Ison MG. Effect of a Mobile Web App on Kidney Transplant Candidates' Knowledge About Increased Risk Donor Kidneys: A Randomized Controlled Trial. *Transplantation*. 2016 Jul 12. [Epub ahead of print] PMID: 27463536.

Grant Review

Reviewer, Special Emphasis Panel/Scientific Review Group (Healthcare Delivery and Methodologies) 2016/10 ZRG1 HDM-C (03) M meeting.

Leora Cherney

Morean, D. F. & **Cherney, L. R.** (2016). Screening for cognitive impairment associated with chemotherapy for breast cancer. Current Breast Cancer Reports, doi:10.1007/s12609-016-0219-2.

Presentations:

Hurwitz, R., **Babbitt, E. M.**, & **Cherney, L. R.** Including people with aphasia in studies using PROMIS. Poster presented at the Health Measures Users Workshop, Chicago, IL (June, 2016).

Raymer, A., Simmons-Mackie, N., & **Cherney, L. R.** Communication Partner Training in Aphasia: Updated Systematic Review. Oral session presented at the 30th World Congress of the International Association of Logopedics and Phoniatics. Dublin, Ireland. (August, 2016)

Robin Cohen

Observation study: Examining Sleep Disturbance in Acute Stroke Patients

Sudarshan Dayanidhi

Zogby AM, **Dayanidhi S**, Chambers HG, Schenk S, Lieber RL (2016). Skeletal muscle fiber-type specific succinate dehydrogenase activity in cerebral palsy. *Muscle and Nerve*, (Accepted).

Kinney MC, **Dayanidhi S**, Dykstra P, McCarthy JJ, Peterson CA, Lieber RL (2016). Reduced skeletal muscle satellite cell number alters muscle morphology after chronic stretch but allows limited serial sarcomere addition. *Muscle and Nerve*, In Press.

Elliot JM, **Dayanidhi S***, Hazle C*, Hoggarth MA*, McPherson J*, Sparks C*, Weber KA* (2016). Advancements in imaging technology: Do they (or will they) equate to advancements in our knowledge of recovery in whiplash? *Journal of Orthopaedic and Sports Physical Therapy* (Accepted) (* Alphabetical).

Dayanidhi S, Buckner EH, Chambers HG, Schenk S, Lieber RL. Reduced mitochondrial enzyme activity in skeletal muscle in children with cerebral palsy. 5th *International Conference on Cerebral Palsy and other Childhood-onset Disabilities*, June 2016, Stockholm, Sweden. (Podium)

Dayanidhi S, Kinney MC, Dykstra P, McCarthy JJ, Peterson CA, Lieber RL. Reduced muscle stem cell number impairs serial sarcomere addition and causes muscular contractures. 5th *International Conference on Cerebral Palsy and other Childhood-onset Disabilities*, June 2016, Stockholm, Sweden.

Teaching: Muscle physiology, satellite cells and changes in cerebral palsy, July 2016, Master's Program in Prosthetics and Orthotics, Northwestern University Prosthetics-Orthotics Center, Northwestern University.

Andrea Domenighetti

Submitted a limited application to Northwestern Uni for the The Hartwell Foundation Individual Biomedical Research Award (“Identifying epigenetic defects of muscle stem cells in cerebral palsy”), June 3

Presented a poster (entitled “Impaired satellite cells differentiation in children with cerebral palsy”) at the scientific meeting “Molecular Mechanisms Modulating Skeletal Muscle Development and Homeostasis in Health and Disease”, Asilomar Conference Grounds, Pacific Grove, CA, June 6-11

- June 21-July 5: Abstracts reviewer and selection for the AHA’s 2016 Scientific Sessions meeting (New Orleans, Nov 12-16), June 21-July 5

RIC research seminar “An Introduction To Molecular Biology Of The Cell”, August 19

Mentoring summer student for the RIC Summer Internship in Engineering and Neuroscience, June 20-August 26

Diane Dudas Sheehan

Sheehan, D. D., & Martin, S. A. (2016). Supporting clinicians to write: APN publication committee efforts successful. *Journal of Pediatric Health Care*, 30(4), 295-298. doi: <http://dx.doi.org/10.1016/j.pedhc.2016.04.011>

Presented “Comprehensive Evaluation and Practical Treatment of Children with Wounds” I presented to PM&R residents/medical students during Pediatric rotation at the Rehabilitation Institute of Chicago, June 7

Presented “Neuromuscular Scoliosis Evaluation and Management” I presented to PM&R residents /medical students during Pediatric rotation at the Rehabilitation Institute of Chicago, July 26

Received an Outstanding Teacher’s 2016 Award

Member, Women’s Faculty Organization Steering Committee, NU

Levi Hargrove

Bercich RA , Wang Z , Mei H , Hammer LH , Seburn KL , **Hargrove LJ** , Irazoqui PP. Enhancing the versatility of wireless biopotential acquisition for myoelectric prosthetic control. *Journal of Neural Engineering* 13(4):046012. DOI: 10.1088/1741-2560/13/4/046012

Earley, EJ and **Hargrove, LJ**. “The Effect of Wrist Position and Hand-Grasp Pattern on Virtual Prosthesis Task Performance.” 6th IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob) June 26-29, 2016. UTown, Singapore

Rouse EJ, Mooney LM, **Hargrove LJ**. "The design of a lightweight, low cost robotic knee prosthesis with selectable series elasticity." 6th IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob) June 26-29, 2016. UTown, Singapore.

Simon AM, Ingraham KA, Spanias JA, Young AJ, **Hargrove LJ**. Development and preliminary testing of a flexible control system for powered knee-ankle prostheses. 6th IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob) June 26-29, 2016. UTown, Singapore.

Allen Heinemann

Publications:

Kirby L, Worobey L, Cowan R, Pedersen JP, **Heinemann AW**, Dyson-Hudson T, Shea M, Smith C, Rushton P, Boninger M. Wheelchair Skills Capacity and Performance of Manual Wheelchair Users with Spinal Cord Injury, *Archives of Physical Medicine and Rehabilitation*, in press.

Heinemann AW, Miskovic A, Semik P, Wong A, Dashner J, Baum C, Magasi S, Hammel J, Tulsy DS, Garcia S, Jerousek S, Lai JS, Carlozzi NE, Gray DB. Measuring Environmental Factors: Unique and Overlapping ICF Coverage of Five Instruments, *Archives of Physical Medicine and Rehabilitation*, in press

Lai JS, Hammel J, Jerousek S, Miskovic A, Baum C, Wong AK, Dashner J, **Heinemann AW**. An Item Bank to Measure Systems, Services, and Policies: Environmental Factors Affecting People with Disabilities, *Archives of Physical Medicine and Rehabilitation*, in press.

Pretz CR, Kean J, **Heinemann AW**, Kozlowski AJ, Bode RK, Gebhardt E. A Multidimensional Rasch Analysis of the Functional Independence Measure Based on the National Institute on Disability, Independent Living, and Rehabilitation Research Traumatic Brain Injury Model Systems National Database, *Journal of Neurotrauma*, 33:1358-1362, July 15, 2016.

Locatelli SM, Etingen B, **Heinemann A**, Neumann HD, Miskovic A, Chen D, LaVela SL. Perceptions of shared decision-making among patients with spinal cord injuries/disorders. *Topics in Spinal Cord Injury Rehabilitation*. 2016;22(3):192-202.

Presentations

Locatelli SM, Etingen B, **Heinemann AW**, Neumann HD, Miskovic A, Chen D, LaVela SL. Perceptions of shared decision-making among patients with spinal cord injury/disorders. Orlando, FL. August 30 - September 1, 2016. Paralyzed Veterans of America Summit 2016. Platform.

LaVela SL, Etingen B, Locatelli S, Miskevics S, **Heinemann AW**. Factors associated with patient-reported low satisfaction with life in individuals with spinal cord injuries/disorders. Orlando, FL. August 30 - September 1, 2016. Paralyzed Veterans of America Summit 2016. Platform.

Grants Funded

Department of Defense. **Heinemann AW** (Principal Investigator): Enhancing Quality of Orthotic Services with Process and Outcome Information. Probable start date September 30, 2016 to September 29, 2019.

Craig H. Neilsen Foundation. **Heinemann AW** (Principal Investigator): Implementing SCI-QOL Into Clinical Practice to Enhance Patient Engagement. FY16-17

Craig H. Neilsen Foundation. **Heinemann AW** (Site PI; Pam Kisala, PI): Clinical Adaptation of the Spinal Cord Injury- Quality of Life (SCI-QOL) Psychosocial Measures. FY16-17

Grant submitted

Midwest Regional Spinal Cord Injury Care System renewal Chen/**Heinemann** (Principal Investigators)

Grants in development

NCMRR: Defining Trajectories of Neurologic and Quality of Life Outcomes Following Stroke

Arun Jayaraman

Radhakrishnan S, Kohler F, Gutenbrunner C, Jayaraman A, Li J, Pieber K, and 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*. Published online July 1; DOI: 10.1177/0309364616652016.

Book Chapter:

Using Robotic Exoskeletons for Over-Ground Locomotor Training. **Jayaraman A**, Burt S, Rymer WZ. In *Neurorehabilitation Technology*, Eds Reinkensmeyer DJ and Dietz, V. pp493-511, August 4, 2016

Todd Kuiken

Patent:

Powered and Passive assistive Device and Related Methods. **Kuiken T**, Lipsey J, Lenzi T, Cempini M. US Patent #20160158029 A1; Publication Date June 9, 2016.

Eric Larson

Larson, E.B. (2016). Recognizing Manifestations of Posttraumatic Stress Disorder in Patients with Traumatic Brain Injury. In F.S. Zollman, (Ed.) *Management of Traumatic Brain Injury, 2nd Ed.*. New York: Demos Medical Publishing.

Larson, E.B. (2016). Cognitive Impairment: Characterization and Management. In F.S. Zollman, (Ed.) *Management of Traumatic Brain Injury, 2nd Ed.* New York: Demos Medical Publishing.

Zollman, F.S. & Larson, E.B. (2016). Sleep Disturbances. In F.S. Zollman, (Ed.) *Management of Traumatic Brain Injury, 2nd. Ed.* New York: Demos Medical Publishing.

Linda Morris

Morris, L.L. (2016). Tracheostomy care takes a team. *Advance for Nurses*. Accessed 7/14/16 at <http://nursing.advanceweb.com/Features/Articles/Tracheostomy-Care-Takes-a-Team.aspx>

Shubhra Mukherjee: Received a Northwestern University Simulation 2015 “Innovations Pilot Grant” sponsored by the Department of Medical Education, FSM

Christopher Reger

Abstract accepted in American Journal of Physical medicine and rehabilitation March 2016. Ultrasound Guidance for technically Challenging Intrathecal Baclofen Pump Refill. Maneyapanda, Chien, Amorapanth, Reger, McCormick

Chapman’s Orthopedic textbook Chapter 13- Lower Extremity prosthetics accepted for publication. Online and print version to follow. Christopher Robinson, Christopher Reger, Michael Stephens

Elliott Rouse

Grant Funded:

US Special Ops Command, “Data Driven Intent Recognition Framework” Role: Co-PI

Grants Submitted:

Office of Naval Research Defense University Research Instrumentation Program (DURIP) “Robotic instrument for measuring leg stiffness to detect likelihood for injury”; Role: PI

Dept. of Veterans Affairs Merit Award, “Intraoperative Optimization and Validation of Musculoskeletal Reconstruction”; Role: Co-I

Rouse EJ and Krebs, “Summary of Human Ankle Mechanical Impedance during Walking.” *IEEE Journal of Translational Engineering in Health and Medicine*, accepted for publication

Shepherd M, and Rouse EJ. “Design and Validation of a Torque-Controllable Knee Exoskeleton for Stai-toStand Assistance.” *IEEE Transactions on Mechatronics*, submitted

Presentations:

Dynamic Walking Conference, “The role of mechanical impedance in the development of effective wearable robots” Michigan, June 4 – 7

Robotic Science and Systems Conference Workshop, “Socially and Physically Assistive Robotics for Humanity” Michigan, June 18 – 19

Robotic Science and Systems Conference Workshop, “Impedance Inspired Design” Michigan, June 18 – 19

Mechanical Engineering Seminar, “The hidden mechanics of locomotion: new approaches to the design and control of wearable robots”, Ohio State University, August 1, 2016

Rouse EJ, Mooney LM, Hargrove LJ. “The design of a lightweight, low cost robotic knee prosthesis with selectable series elasticity.” 6th IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob) June 26-29, 2016. UTown, Singapore

W. Zev Rymer

Presented “Spasticity: mechanisms, quantifications, and treatment” at 2016 School and Symposium in Advanced Neurorehabilitation (SSNR2016) in Baiona, Spain, June 4

Presented “20 Years Later: What have we learned and what has changed?” at 20th Anniversary Meeting of Biomechanics and Neural Control of Movement (BANCOM 2016) in Sterling, OH, June 13

Presented “Neural origins of muscle weakness in hemispheric stroke survivors” by X Hu, WZ Rymer, N Suresh, at International Motoneuron Meeting in Istanbul, Turkey, June 22

Presented “Robotics in SCI rehabilitation: are we doing better?” at 50th Anniversary, Spinal Cord Injury Center, Heidelberg University Hospital in Heidelberg, Germany, June 24

Published “Re-evaluation of EMG-torque relation in chronic stroke using linear electrode array EMG recordings” by Bhadane M, Liu J, **Rymer WZ**, Zhou P, Li S in *Sci Rep* 2016 (PMID: 27349938)

Presented “Decomposition methods reveal anomalies in motor unit recruitment during voluntary muscle” for Pre-Congress ISEK Workshop 1A – Motor unit decomposition: Techniques and applications (**Zev Rymer**, Nina Suresh, and Xiaogang Hu) in Chicago, IL, July 5

Presented keynote lecture “Clinical applications for advanced electromyographic techniques: A field in transition” at ISEK 2016 in Chicago, IL, July 7

Published “Altered motor unit discharge patterns in paretic muscles of stroke survivors assessed using surface electromyography” by Hu X, Suresh AK, Rymer WZ, Suresh NL in *J Neural Eng* (PMID: 27432656)

Presented “Intermittent hypoxia and neurorehabilitation in humans” at Intermittent Hypoxia Workshop in Atlantic Beach, FL, July 28

Presented “Acute intermittent hypoxia as a potential therapy in spinal cord injury” at Grand Rounds, Rehabilitation Institute of Chicago, August 10

Paper presentation: “Altered viscoelastic properties of stroke-affected muscles estimated using ultrasound shear waves -- preliminary data” by Ghulam Rasool, Allison Wang, **Zev Rymer**, and Sabrina Lee at EMBC 2016 in Orlando, FL, August 18

Paper presentation: “Using surface electromyography to detect changes in innervation zones pattern after human cervical spinal cord injury” by Babak Afsharipour, Milap Sandhu, Ghulam Rasool, Nina Suresh, and **Zev Rymer** at EMBC 2016 in Orlando, FL, August 18

RESEARCH FACULTY

Anne Deutsch

Publications

Middleton A, Graham JE, Lin Y, Goodwin JS, Pettger JP, **Deutsch A**, Ottenbacher KJ. Motor and Cognitive Functional Status are Associated with 30-day Unplanned Rehospitalization Following Post-Acute Care in Medicare Fee-for-Service Beneficiaries. *Journal of General Internal Medicine*. In Press.

[Kumar A](#), [Karmarkar AM](#), [Graham JE](#), [Resnik L](#), [Tan A](#), [Deutsch A](#), [Ottenbacher KJ](#).

Comorbidity Indices Versus Function as Potential Predictors of 30-Day Readmission in Older Patients Following Postacute Rehabilitation. *Journals of Gerontology: Medical Sciences*. In Press

Presentations

Deutsch A. Quality Measure Development and Post-Acute Care Quality Measurement in “Healthcare Quality and Patient Safety” course (501) Northwestern University Feinberg School of Medicine. Chicago, IL, July 20, 2016. Graduate course.

Deutsch A. Functional Abilities and Goals. Presentation at the Centers for Medicare and Medicaid Services’ Long-Term Care Hospital Quality Reporting Program Training, Chicago, IL; August 11, 2016.

Schwartz M, Seibert J, **Deutsch A**, Smith L, Thaker S, Pardasaney P, Zheng T, Barch D, Mandl S, Padgett C, Van C, Reilly K. Implementation and Evaluation of a Cross-Setting Quality Measure for Pressure Ulcers. *Academy Health*. June 27, 2016. Boston, MA.

Linda Ehrlich-Jones

Publications

Zeigler M, Smiley J, **Ehrlich-Jones L**, & Moore J. (2016). Use of the Pressure Ulcer Scale for Healing (PUSH) in Inpatient Rehabilitation: A case example. *Rehabilitation Nursing*, 41, 207-210.

Grants Submitted

Craig H. Neilsen **Ehrlich-Jones** (Principal Investigator)

Training Therapists in Motivational Interviewing to Enhance Rehabilitation Participation in SCI

Grants in development

PCORI **Ehrlich-Jones** (Principal Investigator): Comparison of Walk with Ease and Enhance Fitness to Increase Physical Activity in Older Adults with Osteoarthritis of the Knee

Professional Activities

Member, Provost’s Advisory Council on Women Faculty

Marylou Guihan

Grants Approved/Pending:

Funder: VA HSR&D QUERI Program Project grant

PI: Rubin

Dates: 10/16-9/19

Total budget: \$4 million

Title: Combating Antimicrobial Resistance through Rapid Implementation of Available Guidelines and Evidence (CARRIAGE); Evans (Hines).

My role: Co-investigator

Funder: Department of Defense, CDMRP

PIs: Laura Carbone and Frances Weaver.

Dates: 10/1/16- 9/30/19.

Total budget: \$667,388

Title: Management of Osteoporotic Fractures in Veterans with Spinal Cord Injury

My role: Co-investigator

Grants submitted June 2016:

VA HSR&D, 1/1/17-12/31/19. \$ 780,595. PI: Marylou Guihan, PhD. Engaging Patients and Providers in Identifying and Addressing Modifiable Risk Factors to Prevent Community-Acquired Ulcers in Veterans with SCI

VA HSR&D, 1/1/17-12/31/19. \$ 780,595. PI: David Bentrem, MD. Cluster-randomized trial of provider learning modules to prevent post discharge VTE after major cancer surgery. Role: Co-investigator

HSR&D, 1/1/17-12/31/17. \$100,000. PI: Nasia Safdar, MD. Characterizing the patient experience with Clostridium difficile infection. Role: Co-investigator

HSR&D, 1/1/17-12/31/19. \$ 635,926. PI: Nasia Safdar, MD. Mentored Enhanced Implementation and Evaluation of National VA Mandates To Prevent The Spread Of C Difficile infection. Role: Co-investigator

HSR&D, 1/1/17-12/31/19. \$ 769,394. PIs: Laura Carbone, MD + Frances Weaver, PhD, MD. Best Practices for Management of Fractures in Spinal Cord Injuries and Disorders Role: Co-investigator

Publications:

Guihan M, Sohn MW, Bauman WA, Spungen AM, Powell-Cope GM, Thomason SS, Collins JF, Bates-Jensen BM. The Difficulty in Identifying Factors Responsible for Pressure Ulcer Healing in Veterans with Spinal Cord Injury. Arch Phys Med Rehabil. 2016 Jun 30. pii: S0003-9993(16)30267-2. [Epub ahead of print] PubMed PMID: 27373743.

Thomason SS, Powell-Cope G, Peterson MJ, **Guihan M**, Wallen ES, Olney CM, Bates-Jensen B. A Multisite Quality Improvement Project to Standardize the Assessment of Pressure Ulcer Healing in Veterans with Spinal Cord Injuries/Disorders. Adv Skin Wound Care. 2016 Jun;29(6):269-76 PubMed PMID: 27171255.

Lones K, Ramanathan S, Fitzpatrick M, Hill JN, **Guihan M**, Richardson MS, Evans CT. The Feasibility of an Infection Control "Safe Zone" in a Spinal Cord Injury Unit. Infect Control Hosp Epidemiol. 2016 Jun;37(6):714-6.Epub 2016 Feb 26. PubMed PMID: 26916410.

Annie Simon

Simon AM, Ingraham KA, Spanias JA, Young AJ, Hargrove LJ. Development and preliminary testing of a flexible control system for powered knee-ankle prostheses. 6th IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob) June 26-29, 2016. UTown, Singapore

Ming Wu

Wu, M., Kim, J., Arora, P., Gaebler-Spira, D.J., Zhang, Y. Providing controlled pelvis and leg assistance during treadmill training improves overground walking speed in children with cerebral palsy, *Neural Plasticity*, 2016, accepted.

NIH/NICHHD, R01HD083314

Date of Project Period: 06/10/2016-03/31/2021

Title: Improve dynamic lateral balance of humans with SCI

PI, Ming Wu, PhD.

NORTHWESTERN UNIVERSITY PROSTHETICS & ORTHOTICS CENTER

Publications:

Fatone S, Major MJ, Caldwell R. Letter to the Editor *in response to Samitier et al 2016*, The benefits of using a vacuum-assisted socket system to improve balance and gait in elderly Transtibial amputees. *Prosthetics and Orthotics International*, 2016 (in press).

Borrenpohl D, Kaluf B, Major MJ. (2016) Survey of US practitioners on the validity of the Medicare Functional Classification Level system and utility of clinical outcome measures for aiding K-level assignment. *Archives of Physical Medicine and Rehabilitation*, 97(7)1053-1063.

Major MJ, Alford M. Validity of the iPhone M7 motion co-processor as a pedometer for able-bodied ambulation. *Journal of Sports Sciences* 2016 (in press).

"A Conversation With Christopher Robinson, MS, MBA, CPO, ATC, FAAOP (D)" *O&P News*, June 2016.

Fatone S, Caldwell R (in press) Northwestern University Flexible Subischial Vacuum Socket for Persons with Transfemoral Amputation: Part 1 Description of Technique. *Prosthetics and Orthotics International*.

Fatone S, Caldwell R (in press) Northwestern University Flexible Subischial Vacuum Socket for Persons with Transfemoral Amputation: Part 2 Preliminary Evaluation. *Prosthetics and Orthotics International*.

Presentations:

Stefania Fatone, PhD, presented “The Final Frontier: Developments in Transfemoral Sockets” as part of the joint Northwestern University Feinberg School of Medicine Department of Physical Medicine & Rehabilitation/Rehabilitation Institute of Chicago’s Clinical Research Grand Rounds.

Brown SE, Russell Esposito E, Ikeda A, Ferguson J, **Caldwell R, Fatone S**, and Wilken JM (2016) Effect of Socket Design and Suspension on Walking Mechanics. George E. Omer Jr. Research and Alumni Lectureship. Brooke Army Medical Center, June 16, San Antonio, Texas.

Brown SE, Russell Esposito E, **Fatone S, Caldwell R**, Wilken J (2016) Effect of socket design and suspension on walking mechanics. 40th Annual Meeting of the American Society of Biomechanics, August 2-5, Raleigh, North Carolina.

Fatone S, Caldwell R (2016) Development of the Northwestern University Flexible Sub-Ischial Vacuum (NU-FlexSIV) Socket for Persons with Transfemoral Amputation. Military Health System Research Symposium (MHSRS), 15-18 August, Kissimmee, Florida.

Major MJ, Zavaleta JL, Boutwell E, Gard SA. Decreasing below-knee prosthesis longitudinal stiffness increases prosthetic-side push-off and collision work during gait. To be presented at the 40th Annual American Society of Biomechanics Meeting, Raleigh, NC, August 2 - 5, 2016.

Major MJ, Reimold N, Ndubuisi-Obi F, Gordon KE. Anticipatory adjustments to margin of stability with perturbation uncertainty during below-knee amputee gait. To be presented at the 40th Annual American Society of Biomechanics Meeting, Raleigh, NC, August 2 - 5, 2016.

Awards/Appointments:

Jennifer Murphy (MPO 2017) was the winner of the 2016 Dale Yasukawa Award. This award is eligible to currently enrolled students in the Northwestern University Masters of Prosthetics and Orthotics (MPO) program. The Yasukawa Scholarship encourages the awardee to participate in annual meetings of the American Academy of Orthotists and Prosthetists (AAOP).

Stefania Fatone, PhD, was appointed July 1, 2016, to the Board of Directors and assumed the duties of Research Committee Chair for the Orthotic and Prosthetic Research and Education Foundation (OPERF). Dr. Fatone has served as a member of the Research Committee since OPERF was founded in 2008.

Stefania Fatone, PhD, participated in the Department of Veterans Affairs Scientific Merit Review Board, Rehabilitation Engineering and Prosthetics/Orthotics Subcommittee meeting on August 2, 2016, in Washington, DC.

Thesis Defenses:

Thomas Curran, successfully defended his Master's thesis on July 21, 2016. The thesis was entitled "The Effects of Foot-Ankle Components on the Mechanical Properties of Dynamic Response Prosthetic Feet."

Laboratory Visits/Events:

Dr. Samuel Kesner, Director of Research and Advanced Development at Myomo, Inc. visited NUPOC on May 26, 2016. Dr. Kesner gave an overview presentation on the Myomo myoelectric orthosis technology for NUPOC faculty and students. Dr. Kesner was also able to meet with **Drs. Stefania Fatone** and Elliot Roth to discuss potential research opportunities.

The **Northwestern University Prosthetics-Orthotics Center (NUPOC)** held the "NU-FlexSIV Socket Course" (June 8-9 and July 22-23, 2016), part of a series of 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.

At the invitation of **Dr. Stefania Fatone**, Andreas Radspieler a prosthetist from Romedis gmbh in Germany and the inventor of the Symphonie Aqua Casting System, visited NUPOC on June 20, 2016. During the day-long visit, Mr. Radspieler provided a demonstration and lecture for NUPOC faculty and students about how the Symphonie Aqua Casting System works, giving us the opportunity to gain a better understanding of what this technique has to offer the prosthetic profession. Technologies such as this are important as they have the potential to increase consistency of the casting process required for prosthetic socket fabrication.

Dr. Karl Zelik, Assistant Professor at Vanderbilt University, visited NUPOC on July 5, 2016. Dr. Zelik gave a presentation on "Translating Biomechanical Insights into Mobility-Enhancing Assistive Technology" for NUPOC faculty and students as well as meeting with **Drs. Stefania Fatone and Matthew Major** to discuss potential research collaboration.

NUPOC held its annual Advisory Board Meeting on July 14, 2016. Led by John Michael, the meeting provided an opportunity to review progress made in the MPO program as well as discuss ideas for future directions and initiatives. **Drs. Steven Gard, Stefania Fatone** and Elliot Roth were in attendance, along with external committee members and both current and former student representatives.

Dr. William Brett Johnson, post-doctoral fellow at the Rehabilitation Engineering Research Center at National Taiwan University and former NUPOC graduate student, visited NUPOC on August 5, 2016. Dr. Johnson gave a presentation on "Exploring Swing Phase Dynamics of RGO-Assisted Gait through Mathematical Modeling" for NUPOC faculty and students.

The **Northwestern University Prosthetics-Orthotics Center (NUPOC)** hosted two educational programs and site visits for the National Student Leadership Conference (NSLC) on August 8 and 9, 2016. R. J. Garrick, PhD, developed and managed these STEM programs.

Grant Submissions:

Stefania Fatone, PhD, was co-investigator on an NIH R21 grant application titled “Ankle Foot Orthoses – Footwear Combinations: Biomechanics and Walking” submitted on July 15, 2016 (PI: Kristie Bjornson, PhD, University of Washington).

Steven Gard, PhD, submitted an application entitled “Development and Evaluation of an Improved Prosthetic Foot/Shoe Interface” to the Department of Veterans’ Affairs Rehabilitation R&D Program on June 15, 2016.

Matthew Major, PhD, was a co-investigator on an NSF Early-concept Grants for Exploratory Research (EAGER) proposal titled “Evaluating Lower Leg Trajectory Error: A Novel Metric to Quantify the Mechanical Performance of Prosthetic Feet” (PI: Amos Winter, PhD, Massachusetts Institute of Technology).

Matthew Major, PhD, was a co-investigator on an NSF Career Award titled “CAREER: High performance, low-cost, passive prosthetic knees optimized to replicate physiological gait in multiple mobility scenarios” (PI: Amos Winter, PhD, Massachusetts Institute of Technology).

OTHER FACULTY

Ross Arena

Peer Reviewed Publications

1. Caruso FC, Bonjorno JC, Mendes RG, Sperling MPR, Arakelian VM, Bassi D, Arena R, Borghi-Silva A. Hemodynamic and metabolic response during dynamic and resistance exercise in different intensities: A cross-sectional study on implications of intensity on safety and symptoms in patients with coronary disease. *American Journal of Cardiovascular Disease*. 2016;636-45.
2. Bublitz C, Renno A, Ramos R, Assis L, Sellera CA, Trimer R, Borghi-Silva A, Arena R, Guizilini S. Acute effects of low-level laser therapy irradiation on functional capacity, blood lactate and muscle fatigue perception in hospitalized patients with heart failure – a pilot study. *Lasers in Medical Science*. 2016;31:1203-1209.
3. Bolzan DW, Trimer R, Begot I, Nasralla M, Forestieri P, Mendez V, Arena R, Gomes WJ, Guizilini S. Open lung ventilation improves clinical outcomes in off-pump coronary bypass surgery: A randomized controlled trial. *Journal of Cardiothoracic and Vascular Anesthesia*. 2016;30:702-708.

4. [Arena R](#), Lavie CJ, Daugherty J, Bond S, Phillips S, Borghi-Silva A. The combination of obesity and hypertension: A highly unfavorable phenotype requiring attention. *Current Opinion in Cardiology*. 2016;31:394-401.
5. Horsley KJ, Rouleau CR, Garland SN, Samuels CS, Aggarwal SG Stone JA, [Arena R](#), Campbell TS. Insomnia symptoms and heart rate recovery among patients enrolled in cardiac rehabilitation. *Journal of Behavioral Medicine*. 2016;39:642-651.
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9. Campos FV, Neves LM, Silva VZ, Chiappa GR, Cahalin L, [Arena R](#), Cipriano GF, Cipriano Jr G. Hemodynamic effects induced by transcutaneous electrical nerve stimulation in apparently healthy subjects: a systematic review and meta-analysis. *Archives of Physical Medicine and Rehabilitation*. 2016;97:826-835.
10. Lacerda D, Costa D, Reis M, Gomes E, Costa I, Borghi-Silva A, Marsico A, Roberto Stirbulov R, [Arena R](#), Sampaio L. Influence of bilevel positive airway pressure on autonomic tone in hospitalized patients with decompensated heart failure. *The Journal of Physical Therapy Science*. 2016;28:1-6.
11. Sperling MPR, Caruso FC, Mendes R, Dutra DB, Arakelian V, Bonjorno JC, [Catai AM](#), [Arena R](#), Borghi-Silva A. Relationship between noninvasive hemodynamic responses and cardiopulmonary exercise testing in patients with coronary artery disease. *Clinical Physiology and Functional Imaging*. 2016;36:92-98.
12. [Arena R](#), Myers J, Kaminsky L. Revisiting age-predicted maximal heart rate: can it be used as a valid measure of effort? *American Heart Journal*. 2016;173:49-56.
13. Franklin NC and [Arena R](#). Personalized weight management interventions for cardiovascular risk reduction: A viable option for African-American women. *Progress in Cardiovascular Diseases*. 2016;58:595-604.

Active Funded Projects

Facilitating functional independence in patients requiring prolonged mechanical ventilation. RO1 National Institutes of Health, 1,536,016 (Co-investigator).

Comparing aerobic training to combined aerobic and inspiratory Muscle training in patients with pulmonary arterial hypertension: A Randomized controlled trial. Brazilian National Council for Scientific and Technological Development, 346,000 Reals (Visiting Professor Exterior).

Peripheral Muscle Oxygenation and Ventilation During Dynamic Exercise High Intensity Players in Football: A randomized trial of the effects of the Respiratory Muscle Training Improves Exercise Tolerance clinical trial. Brazilian National Council for Scientific and Technological Development, 518,186 Reals (Investigator).

Interleukin-1 blockade in recently decompensated heart failure. NHLBI, \$677,769 (co-investigator)

Heart failure substudy: A randomized, double-blind, placebo-controlled, event driven trial of quarterly subcutaneous canakinumab in the prevention of recurrent cardiovascular events among stable post-myocardial infarction patients with elevated hsCRP (CANTOS). Novartis Pharmaceuticals, 150,000 (Co-investigator)

Exercise therapy to reduce heart failure symptoms; sorting mechanisms and benefits. VA Merit Award, \$1,100,000 (Co-investigator)

Invited Speaker Presentations

1. AHA Worksite Wellness Solutions Webinar, American Heart Association, Dallas, TX, June 2016.
2. Creating the preventive medicine healthcare system to combat chronic disease. World Congress of Cardiology & Cardiovascular Health 2016, Mexico City, Mexico, June 2016.
3. HealthPark@Grant Park Panel Discussion. Grant Park Advisory Council & Grant Park Conservancy Public Meeting. Chicago, IL, June 2016.

Special Appointments/Distinctions

Chairman, European Society of Preventive Medicine
Member of the European Union Platform for Action on Diet, Physical Activity and Health.

Founding Fellow, European Society of Preventive Medicine

Metro Chicago Board of Directors, American Heart Association

Teresa Savage

Book chapter:

Savage, T. A. (2016). Ethical considerations. In F. Zollman (Ed.). *Manual of traumatic brain injury: Assessment and management* (2nd Ed.). New York: Demos Medical Publishers.

Presented "What professional ethics consultants need to know about I/DD". *140th Annual Meeting, American Association on Intellectual and Developmental Disabilities*. Atlanta, Georgia, June 6-9, 2016