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.


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

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

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).


Robin Cohen
Observation study: Examining Sleep Disturbance in Acute Stroke Patients

Sudarshan Dayanidhi


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


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

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


Allen Heinemann

Publications:


Presentations


Grants Funded
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**

**Book Chapter:**

**Todd Kuiken**

*Patent:*

**Eric Larson**


**Linda Morris**

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

Christopher Reger

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


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, “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

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


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: “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


Presentations

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.


Linda Ehrlich-Jones

Publications

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. PI: Laura Carbone, MD + Frances Weaver, PhD, MD. Best Practices for Management of Fractures in Spinal Cord Injuries and Disorders Role: Co-investigator

Publications:


Annie Simon


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/NICHD, 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:


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


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.


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:**


**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


**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).


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:
