

Department of Physical Medicine & Rehabilitation

Scholarly Activities
September – November 2016

REGULAR FACULTY

Randy Calisoff:

Nominated 2015-2016 Outstanding Teacher of the Year, FSM clinical preceptorship curriculum (2nd year)

Reviewer: Topics on Stroke Rehabilitation

Abstracts accepted: 2017 American Academy of Pain Medicine annual meeting: “Short-Term Functional and Psychological Outcomes of Comprehensive, Interdisciplinary Pain Management of Chronic Lumbar Radicular Pain”; “Enhancing Physical Conditioning of Patients with Chronic Lumbar Radicular Pain through a Comprehensive, Interdisciplinary Pain Management Program”; “Retrospective and Prospective Functional Outcomes of an Interdisciplinary Pain Management Program on Patients with Fibromyalgia”

Two book chapters in progress.

Co-Investigator, grant submitted to NIDA/NIH (Schnitzer and Apkarian, PI’s) – Chronic Low Back Pain

Sam Chu:

Faculty Instructor, Musculoskeletal Ultrasound Learning Lab, AAPM&R Annual Meeting, New Orleans, October

Clinical Case Panel Discussant, Best Musculoskeletal Cases, AAPM&R Annual Meeting, New Orleans, October

Andrea Domenighetti:

October 5: Submitted an NIH R01 grant application entitled: "Muscle impairment in children with cerebral palsy: a role for muscle satellite cells dysfunction"

October 27: Submitted a manuscript to the Journal of Molecular Biology, entitled: "Cullin E3-ligase activity is required for myoblast differentiation"

November 2: Presented at the Annual ACRM Conference “Stem Cells and Muscle Satellite Cells in Cerebral Palsy: Current State of Regenerative Therapies”

Deborah Gaebler:

The use of robotics in pediatrics - 4th International Congress: Research in Disability, at Instituto Nacional de Rehabilitación in México City – November 17, 2016

Speaker –Robotic Rehabilitation Improves Sensorimotor Functions of Lower Limb Impairments for Children with Cerebral Palsy – Visiting Professor Conference – Rehabilitation Institute of Chicago (Gait Lab) – November 4, 2016

Egan T, van Hedel H, Fabara E, Bonato P, Boninger M, **Gaebler-Spira D**. Advanced Robotic Technology Integrated Center-International collaboration on robotic therapy. ACRM 93rd Annual Conference – Chicago, IL – October 30 – November 4, 2016.

Marciniak C, Brander K, Garrett A, Brown M, Wysocki N, **Gaebler-Spira D**. Mobility in Individuals with Cerebral Palsy: What is the Impact on Anthropometric Weight and Quantitative Body Composition Measures? ACRM 93rd Annual Conference – Chicago, IL – October 30 – November 4, 2016.

Gaebler-Spira D, Nandam N, Wolfman J, Panko-Reis J, Todd A, Byrne R, Marciniak C. Women with Neurologic Disabilities: What are the Barriers to Breast Health Screening? American Academy of Physical Medicine and Rehabilitation Annual Assembly – New Orleans, Louisiana – October 20-23, 2016

Marciniak CM, **Gaebler-Spira DJ**, Garrett A, Brander KM, Brown MC, Wysocki NM. Does Mobility Status or Spasticity Contribute to the Metabolic Profile and Body Composition in Individuals with Cerebral Palsy? American Academy of Physical Medicine and Rehabilitation Annual Assembly – New Orleans, Louisiana – October 20-23, 2016

Gaebler-Spira DJ, Marciniak CM, Wolfman J, Panko-Reis J, Byrne R, Bloom ZJ, Todd A. Provider Barriers to Mammography Screening in Women with CP. American Academy of Physical Medicine and Rehabilitation Annual Assembly – New Orleans, Louisiana – October 20-23, 2016

McCormick K, **Gaebler-Spira D**, Tsai S, Krahl S. Clinical Use of 0-10 NRS as a Patient-Reported Spasticity Measure. American Academy of Cerebral Palsy and Developmental Medicine 70th Annual Meeting – Hollywood, FL - September 20-24, 2016

Egan T, van Hedel H, Fabara E, Bonato P, Boninger M, **Gaebler-Spira D**. Advanced Robotic Technology Integrated Center-International collaboration on robotic therapy. American Academy of Cerebral Palsy and Developmental Medicine 70th Annual Meeting – Hollywood, FL - September 20-24, 2016

Bullying in Children and Adolescents with Cerebral Palsy and Other Physical Disabilities. American Academy of Cerebral Palsy and Developmental Medicine 70th Annual Meeting – Hollywood, FL - September 20-24, 2016

Robotic rehabilitation improves sensorimotor functions of lower limb impairments for children with cerebral palsy. American Academy of Cerebral Palsy and Developmental Medicine 70th Annual Meeting – Hollywood, FL - September 20-24, 2016

Toxin- Safe Territory for Both Patients and Providers. American Academy of Cerebral Palsy and Developmental Medicine 70th Annual Meeting – Hollywood, FL - September 20-24, 2016

Breast Cancer Screening in Women with Cerebral Palsy: Could Care Delivery Be Improved? American Academy of Cerebral Palsy and Developmental Medicine 70th Annual Meeting – Hollywood, FL - September 20-24, 2016

Experiences of women with cerebral palsy accessing women's healthcare services. American Academy of Cerebral Palsy and Developmental Medicine 70th Annual Meeting – Hollywood, FL - September 20-24, 2016

Characterizations of Spasticity in Cerebral Palsy. American Academy of Cerebral Palsy and Developmental Medicine 70th Annual Meeting – Hollywood, FL - September 20-24, 2016

Transforming the Healthcare of Women with Disabilities. American Academy of Cerebral Palsy and Developmental Medicine 70th Annual Meeting – Hollywood, FL - September 20-24, 2016

General Movements During The Fidgety Period Correlate with Neurologic Abnormalities and Motor Delays At 18-24 Months In A High Risk United States (USA) Population. American Academy of Cerebral Palsy and Developmental Medicine 70th Annual Meeting – Hollywood, FL - September 20-24, 2016

Lopez-Ortiz C, Egan T, **Gaebler-Spira D**. Pilot Study of a Targeted Dance Class for Physical Rehabilitation in Children with Cerebral Palsy. *Sage Open Medicine* – Volume 4:1-5 2016
Tsai LC, Ren Y, Gaebler-Spira DJ, Revivo GA, Zhang LQ. Effects of an Off-Axis Pivoting Elliptical Training Program on Gait Function in Persons With Spastic Cerebral Palsy: A Preliminary Study. *Am J Phys Med Rehabil*. 2016 Sep 22. [Epub ahead of print] PMID: 27661216

Wu M, Kim J, Arora P, **Gaebler-Spira D**, Zhang Y. Kinematic and EMG Responses to Pelvis and Leg Assistance Force during Treadmill Walking in Children with Cerebral Palsy, *Neural Plasticity*, vol. 2016, Article ID 5020348, 12 pages

Levi Hargrove:

Keynote Speaker: "Control of Bionic Limbs", Trent International *Prosthetic* Symposium (TIPS), Oct, 2016, Glasgow, Scotland.

Presented "Simultaneous and Proportional Control of Powered Prosthesis using Intramuscular EMG", International Society of Electrophysiology and Kinesiology Congress, July 5-8, 2016, Chicago, IL

Adewuyi A, **Hargrove LJ**, and Kuiken TA. "Evaluating EMG Feature and Classifier Selection for Application to Partial Hand Prosthesis Control."). *Frontiers in Neurorobotics*; October 2016 doi: 10.3389/fnbot.2016.00015

AM Simon, KA Ingraham, J Spanias, AJ Young, SB Finucane, EG Halsne, and **LJ Hargrove**. Delaying ambulation mode transition decisions improves accuracy of a flexible control system for powered knee-ankle prosthesis. *IEEE Transactions on Neural Systems and Rehabilitation Engineering* (in press).

Kuiken TA, Miller LA, Turner, K, **Hargrove, LJ**. A comparison of pattern recognition control and direct control of a multiple degree-of-freedom transradial prosthesis. *IEEE Journal of Translational Engineering in Health and Medicine*, in press.

Johnson R, Kording K, **Hargrove L**, and Sensinger J. "EMG versus torque control of human-machine systems: equalizing control signal variability does not equalize error or uncertainty", *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, in Press.

Kuiken TA, Barlow AK, **Hargrove LJ**, and Dumanian GA, "Targeted Muscle Reinnervation for the Upper and Lower Extremity", *Techniques in Orthopaedics*, Accepted Sept 2016.

Papers submitted

Adewuyi A, **Hargrove LJ**, and Kuiken TA, "Resolving the Effect of Wrist Position on Myoelectric Pattern Recognition Control." Submitted to *Journal of Neural Engineering and Rehabilitation*, August 2016

Adewuyi A, Lee K, Tuner K, Kuiken TA, and **Hargrove LJ**, "A Comparison of Conventional and Pattern Recognition Myoelectric Control of Powered Partial-Hand Prostheses" Submitted to *Journal of Rehabilitation Research and Development*, September, 2016

Conference papers

Whitmore M, **Hargrove LJ**, and Perreault E. Estimation of Ankle Impedance During Walking on a Slippery Surface. International Society of Electrophysiology and Kinesiology Congress, July 5-8, 2016, Chicago, IL.

Adewuyi A, **Hargrove LJ**, Kuiken TA Mitigating the effect of wrist kinematics on pattern recognition control. International Society of Electrophysiology and Kinesiology Congress, July 5-8, 2016, Chicago, IL

Whitmore M, **Hargrove LJ**, and Perreault E. Estimation of Ankle Impedance When Walking on a Slippery Walkway. Annual Meeting of the American Society of Biomechanics, August 2-5, 2016. Raleigh, NC.

Cempini M, **Hargrove LJ**, Kuiken TA, and Lenzi T. "Design of a Polycentric Powered Ankle Prosthesis" *38th International conference of the IEEE Engineering in Medicine and Biology Society, August 16-20, Orlando, FL,*

Adewuyi A, Hargrove LJ, Kuiken TA. "Preliminary Functional Outcomes for Myoelectric Pattern Recognition-Based Control of Partial-Hand Prostheses." *38th International conference of the IEEE Engineering in Medicine and Biology Society, August 16-20, Orlando, FL.*

Simon, A, Spanias, J, Ingraham, K, **Hargrove LJ**. "Delaying ambulation mode transitions in a powered knee-ankle prosthesis." *38th International conference of the IEEE Engineering in Medicine and Biology Society, August 16-20, Orlando, FL.*

Spanias, J, Simon, A, Perreault, E., **Hargrove LJ**. "Preliminary results for an adaptive pattern recognition system for novel users using a powered lower limb prosthesis" *38th International conference of the IEEE Engineering in Medicine and Biology Society, August 16-20, Orlando, FL.*

Woodward, R., Spanias, J, **Hargrove LJ**. "User intent prediction with a scaled conjugate gradient trained artificial neural network for lower limb amputees using a powered

prosthesis" 38th International conference of the IEEE Engineering in Medicine and Biology Society, August 16-20, Orlando, FL.

Conference paper submitted

Lenzi T, Cempini M, **Hargrove LJ**, and Kuiken TA. "Actively Variable Transmission for Powered Knee Prostheses." IEEE International Conference on Robotics and Automation (ICRA 2017), to be held from May 29 to June 3, 2017, Singapore.

Grants submitted

Dept. of Defense Congressionally Directed Medical Research Program: Prosthetics Outcomes Research Award; *Determining the Functional Importance of a Powered Multifunction Wrist*; Submitted November 16.

Patent

Ambulation Prediction Controller for Assistive Device, U.S. Patent No. 9,443,203 B2

Allen Heinemann:

LaVela SL, Etingen B, Locatelli S, Miskevics S, **Heinemann AW**. What Determines Low Satisfaction with Life in Persons with SCI/D? Educational conference of the Academy of Spinal Cord Injury Professionals. Nashville, TN. 2016. September 4-7, 2016. Platform.

LaVela SL, **Heinemann AW**, Etingen B, Miskovic A, Locatelli SM, Chen D. Is care delivered to individuals with SCI/D perceived as patient-centered and equitable? Southwest Conference on Disability. Albuquerque, NM. October 5-7, 2016.

Heinemann AW, Hill JN, Etingen B, Miskevics S, LaVela SL. Self-Efficacy in Individuals with SCI with High versus Low Perceptions of Mobility and Fine-Motor Function. Paper presented at the 55th International Spinal Cord Society Annual Scientific Meeting, Vienna, Austria, September 14, 2016.

Heinemann AW, LaVela SL, Etingen B, Locatelli S, Miskevics S, Miskovic A. Predictors of Life Satisfaction in Persons with Spinal Cord Injury. Poster presented at the 55th International Spinal Cord Society Annual Scientific Meeting, Vienna, Austria, September 16, 2016.

Heinemann AW. Development and Validation of the SCI-QOL Ability to Participate and Satisfaction with Participation Item Banks. Symposium presentation at the International Society of Quality of Life, Copenhagen, Denmark, October 21, 2016.

Nowinski C, **Heinemann AW**, Magasi S, Slotkin J. NIH Toolbox: State of the Art Outcome Measures for Rehabilitation Practice and Research. Workshop presented at the 93rd annual meeting of the American Congress of Rehabilitation Medicine, October 30, 2016.

Heinemann AW, Chan L, Hoenig H, Collins G. Authorship, Reporting Guidelines, Reviewing in Medical Rehabilitation. Symposium presented at the 93rd annual meeting of the American Congress of Rehabilitation Medicine, November 1, 2016.

Deutsch A, **Heinemann AW**, Loft J, Smith L. Quality Measure Developments in Medical Rehabilitation. Symposium presented at the 93rd annual meeting of the American Congress of Rehabilitation Medicine, November 1, 2016.

Cella D, **Heinemann AW**, Kisala P, Tulsy D, Victorson D. What do SCI-QOL scores mean? Applying the “Bookmarking” Standard-Setting Methodology in a Rehabilitation Context. Symposium presented at the 93rd annual meeting of the American Congress of Rehabilitation Medicine, November 3, 2016.

Heinemann, AW. The Spinal Cord Injury Model System, Fujian University of Traditional Chinese Medicine, November 9, 2016.

Grants Funded;

Midwest Regional Spinal Cord Injury Care System renewal Chen/**Heinemann** (Principal Investigators), 2016-2021.

Grant submitted:

NIH: Defining Trajectories of Neurologic and Quality of Life Outcomes Following Stroke
DoD: Evaluating the Utilization and Efficiency of Wearable Exoskeletons for SCI Rehabilitation

Grants in development: TBI Model Systems

Service Activity: Participant, ICF Consensus Conference for Traumatic Injuries, Centre for Trauma Sciences, Gatwick, UK, October 13-15, 2016.

Mark Huang:

Huang, M.E., S.R. Laker, and P.C. Smedberg, Merit-Based Incentive Payment System: Preparing Your Practice for Upcoming Change. PM R, 2016. 8(8): p. 792-7.

Abstracts:

Caldwell M, Marshall B, **Huang, ME**. Exercise in Non-Vascular Unilateral Lower Limb Amputees and Intact Limb Knee Injury, Poster presentation, AAPM&R Annual Assembly New Orleans 2016.

Ma H, **Huang ME**, Cognitive Deficits and Swallowing in Patients Admitted to Acute Inpatient Rehabilitation for Recovery from Severe Burn Trauma, Poster presentation, AAPM&R Annual Assembly New Orleans 2016.

Conference presentations:

1. Course 315 and 318: The MACRA Primer: Preparing for the New Quality Payment Program. AAPM&R 2016 Annual Assembly New Orleans, Oct 21, 2016.

Arun Jayaraman:

Presented “Wearable Robotics A Chance to Walk from the Clinic to Your Home” University of Florida, Gainesville, September 28, 2016.

Presented “Exoskeletons for Rehabilitation & Personal Mobility: Creating Clinical Evidence” *The International Symposium on Wearable Robotics*. Segovia, Spain, October 2016.

Jayaraman A & William Z. Rymer. *Short Talk: “Making a case for wearable robotics in the field of rehabilitation” Cybathlon Symposium, Zurich, Switzerland, October 2016.*

Papers Published

Lonini, L., Shawen N, Scanlan K, Rymer WZ, Kording KP, **Jayaraman A.** “Accelerometry-enabled measurement of walking performance with a robotic exoskeleton: a pilot study”. *Journal of Neuroengineering and Rehabilitation*, 13(1), 1, (2016).

Deems-Dluhy SL, Jayaraman C, Green S, Albert MV, **Jayaraman A.** Evaluating the functionality and usability of two novel wheelchair anti-rollback devices for ramp ascent in manual wheelchair users with spinal cord injury. *PM&R* 2016 Sept 21. pii: S1934 1482(16)30965-0. doi: 10.1016/j.pmrj.2016.09.007. [Epub ahead of print] PMID: 27664403

Jayaraman C, Mummidisetty CK, **Jayaraman A.** Effect of wearable sensor dynamics on physical activity estimates: A comparison between SCI vs. healthy individuals. *IEEE in Engineering in Medicine and Biology*. Oct 2016. 10.1109/embc.2016.7591429

Conference papers

Saeb S, Lonini L, **Jayaraman A,** Mohr D, Kording K. “Voodoo Machine Learning for Clinical Predictions”. *BioRxiv*, 2016. doi: <http://dx.doi.org/10.1101/059774> (*authors contributed equally)

Lonini L, Gupta A, Kording K, **Jayaraman A.** “Activity Recognition in Patients with Lower Limb Impairments: Do we need training data from each patient?” Accepted; Proceedings of the IEEE Engineering in Medicine and Biology Society (EMBC’16) conference.

Rymer WZ, Sandhu M, **Jayaraman A.** “Acute Intermittent Hypoxia Enhances Neuroplasticity In Incomplete Spinal Cord Injury”. *International Society of Electrophysiology and Kinesiology Congress*, July 5-8, 2016, Chicago, IL

Grants awarded

NIDILRR SCI Midwest Regional Model Systems: 08/01/2016-07/30/2021 Role: Co-I (Module PI) Funding: \$400,000

Ekso WISE Trial: Randomized Controlled Multi-Site Clinical Trial Comparing Robotic Exoskeleton vs. Conventional Rehabilitation for Individuals with Incomplete SCI: 10/01/2016-9/30/2018.
Role: Site PI; Funding: \$200,000

Todd Kuiken:

Presented “Building Bionics” October 21, Northern Illinois University, De Kalb, IL

Miller LA and **Kuiken TA.** Targeted Reinnervation and pattern recognition control. *The 2nd Annual All Hands Meeting, Department of Defense Osseointegration Program*, Bethesda, MD, October 27, 2016.

Adewuyi A, Hargrove LJ, and **Kuiken TA.** “Evaluating EMG Feature and Classifier Selection for Application to Partial Hand Prosthesis Control.”). *Frontiers in Neurobotics*, October 2016
doi: 10.3389/fnbot.2016.00015

Kuiken TA, Miller LA, Turner, K, Hargrove, L (2016) A comparison of pattern recognition control and direct control of a multiple degree-of-freedom transradial prosthesis. *IEEE Journal of Translational Engineering in Health and Medicine*, in press.

Kuiken TA, Barlow AK, Hargrove LJ, and Dumanian GA, "Targeted Muscle Reinnervation for the Upper and Lower Extremity", *Techniques in Orthopaedics*, Accepted Sept 2016.

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Conference papers

Adeuyi A, Hargrove LJ, **Kuiken TA**. Mitigating the effect of wrist kinematics on pattern recognition control. *International Society of Electrophysiology and Kinesiology Congress*, July 5-8, 2016, Chicago, IL.

Cempini M, Hargrove LJ, **Kuiken TA**, and Lenzi T. "Design of a Polycentric Powered Ankle Prosthesis" *38th International conference of the IEEE Engineering in Medicine and Biology Society, August 16-20, Orlando, FL.*

Adeuyi A, Hargrove LJ, Kuiken TA. "Preliminary Functional Outcomes for Myoelectric Pattern Recognition-Based Control of Partial-Hand Prostheses." *38th International conference of the IEEE Engineering in Medicine and Biology Society, August 16-20, Orlando, FL.*

Conference paper submitted

Lenzi T, Cempini M, Hargrove LJ, and **Kuiken TA**. "Actively Variable Transmission for Powered Knee Prostheses." *IEEE International Conference on Robotics and Automation (ICRA 2017)*, to be held from May 29 to June 3, 2017, Singapore.

Richard Lieber:

Grant Award: Falk Medical Research Trust Catalyst Award, "Breakthrough Technology to Measure Human Muscle Function"

Full Refereed Papers:

Alperin, M., M.S. Cook, M., L.J. Tuttle, M.C Esparza and **R.L. Lieber**. (2016). Impact of vaginal parity and aging on the architectural design of pelvic floor muscles. *Am J Obstet Gynecol*. doi: 10.1016/j.ajog.2016.02.033. PMID: 26953079.

Kinney, M.C., S. Dayanidhi, P.B. Dykstra, J.J. McCarthy, C.A. Peterson and **R.L. Lieber**. (2016). Satellite cells affect stretch-induced skeletal muscle sarcomere addition. *Muscle & Nerve*. doi: 10.1002/mus.25227. PMID: 27343167.

O'Connor, S.M. E.J. Cheng, S.R. Ward and **R.L. Lieber**. (2016). Quantification of sarcomere length distribution in whole muscle frozen sections. *J. Exp. Biol.* doi: 10.1242/jeb.132084. PMID: 26994184.

Cheung, W.W., S. Cherqui, W. Ding, M. Esparza, P. Zhou, J. Shao, **R.L. Lieber**, and R.H Mak. (2016). Muscle wasting and adipose tissue browning in infantile nephropathic cystinosis. J. Cach. Sarcop. Mus. 7:152-164. PMID: 27493869.

Jensen, E., S. Go, S. O'Connor, L. Evertz, D. Morrow, S. Ward, **R.L. Lieber**, and K. Kaufman. (2016). Design considerations of a fiber optic pressure sensor protective housing for intramuscular pressure measurements during isometric activation of skeletal muscle at optimal length. Ann. Biomed. Eng. (in press).

Zogby, A.M., S. Dayanidhi, H.G. Chambers, S. Schenk, **R.L. Lieber**. (2016). Skeletal muscle fiber-type specific succinate dehydrogenase activity is not altered in cerebral palsy. Muscle & Nerve. (in press).

Gillies, A.R., M.A. Chapman, E.A. Bushong, T.J. Deerinck, M.H. Ellisman and **R.L. Lieber**. (2016). J. Physiol. (Lond). (in press).

Review Articles:

Graham, H. Kerr, P. Rosenbaum, N. Paneth, B. Dan, J.-P. Lin, D.L. Damiano, J.G. Becher, D. Gaebler-Spira, A. Colver, D.S. Reddihough, K.E. Crompton and **R. L. Lieber**. (2016). Cerebral Palsy. Nature Disease Reviews. doi:10.1038/nrdp.2015.82. PMID: 27188686.

Chapman M.A., R. Meza and **R.L. Lieber** (2016). Skeletal muscle fibroblasts in health and disease. Differentiation. doi: 10.1016/j.diff.2016.05.007. PMID: 27282924.

Full Papers (submitted):

Chapman, M.A., K. Mukund, S. Subramaniam and **R.L. Lieber**. (2016). Three different cell types produce collagen during skeletal muscle fibrosis. Am J. Physiol. (submitted).

Tirrell, T.F., A.W. Rademaker, and **R.L. Lieber**. (2016) Analysis of hierarchical data structures using mixed-effects models. J. Biomech. (submitted).

Mukund, K., S.R. Ward, **R.L. Lieber**, and S. Subramaniam. (2016). Botulinum neurotoxin effects on skeletal muscle elucidated using co-expression networks. B.M.C. Bioinformatics. (submitted).

Winters, T.M., M. Lim, M. Takahashi, J. Fridén, **R.L. Lieber** and S.R. Ward. (2016). Skeletal muscle force production and excursion are altered by surgical release. J. Hand Surg. Eur. (submitted).

Ward, S.R., V.B. Minamoto, K.P. Suzuki, J.B. Hulst, S.N. Bremner, and **R.L. Lieber**. (2016). Persistent degradation of muscle structure and function more than one-year after a single botulinum toxin injection. Muscle & Nerve (submitted).

Young, K.W., B.P.P Kuo, S.M. O'Connor, S. Radic and **R.L. Lieber**. (2016). In vivo minimally-invasive molecular sensing across millimeters of muscle tissue during movement. Biophys. J. (submitted).

Cheung, W., W. Ding, J.-Y. Zhan, P. Zhou, S. Li, M.C. Esparza, H.M. Hoffman, **R.L. Lieber**, and R.H. Mak. (2016). Vitamin D repletion ameliorates muscle wasting and fibrosis in mice with chronic kidney disease associated cachexia. *J. Am. Soc. Nephrol.* (submitted).

O'Connor, S.M., K.R. Kaufman, S.R. Ward, and **R.L. Lieber**. (2016). Intramuscular pressure correlates with muscle tension in rabbit tibialis anterior. *J. Appl. Physiol.* (submitted).

Go, S.A., E.R. Jensen, S.M. O'Connor, L.Q. Evertz, D.A. Morrow, S.R. Ward, **R.L. Lieber**, and K.R. Kaufman. (2016). Design considerations of a fiber optic pressure sensor protective housing for intramuscular pressure measurements. *J. Biomech. Eng.* (submitted).

Christina Marciniak:

Marciniak, C., Patel, A.T., Munin, M.C., Hanschmann, A., Hiersemenzel, R. and Elovic, E.P., 2016. Efficacy and Safety of Repeated IncobotulinumtoxinA Injections for Upper-Limb Post-Stroke Spasticity. *Accepted for presentation* at the annual meeting of the American Congress of Rehabilitation Medicine, Chicago IL Nov 2016.

Marciniak, C., Gul, F., Ayyoub, Z., Simpson, D.M., Walker, H.W., Wimmer, M., Vilain, C. and Graciès, J.M., 2016. Poster 308 Improvement of Spasticity, Active Movements and Active Function after Repeated Injections of AbobotulinumtoxinA (Dysport) in Adults with Spastic Paresis in the Upper Limb: Results of a Phase III Open-Label Extension Study. Accepted for presentation at the AAPMR Annual Meeting, New Orleans LA, October, 2016.

Published Abstracts:

Gaebler-Spira D., Byrne R., Todd A., Panko Reis J., Wolfman J., Nandam N., Bloom Z., **Marciniak C.**, Roye D. Breast cancer screening in women with cerebral palsy: could care delivery be improved? *Developmental Medicine and Childhood Neurology* Volume 58, Issue S5, September 2016, Page: 61.

Marciniak, C., Patel, A.T., Munin, M.C., Hanschmann, A., Hiersemenzel, R. and Elovic, E.P., 2016. Efficacy and Safety of Repeated IncobotulinumtoxinA Injections for Upper-Limb Post-Stroke Spasticity. *Archives of Physical Medicine and Rehabilitation*, 97(10), p.e10.

Patel, A., **Marciniak, C.**, Munin, M.C., Hanschmann, A., Hiersemenzel, R. and Elovic, E.P., 2016. Randomized, Placebo-Controlled, Phase III Study of IncobotulinumtoxinA for Upper-Limb Post-Stroke Spasticity. *Archives of Physical Medicine and Rehabilitation*, 97(10), pp.e10-e11.

Marciniak, C., Brander, K., Garrett, A., Brown, M.C., Wysocki, N. and Gaebler-Spira, D., 2016. Mobility in Individuals with Cerebral Palsy: What is the Impact on Anthropometric Weight and Quantitative Body Composition Measures? *Archives of Physical Medicine and Rehabilitation*, 97(10), p.e54.

Marciniak, C.M., Gaebler-Spira, D.J., Garrett, A., Brander, K.M., Brown, M.C. and Wysocki, N.M., 2016. Poster 328 Does Mobility Status or Spasticity Contribute to the Metabolic Profile and Body Composition in Individuals with Cerebral Palsy?. *PM&R*, 8(9), pp.S267-S268.

Maneyapanda, M.B., McCormick, Z., **Marciniak, C.M.** and Reger, C.D., 2016. Poster 372 Long-Term Intrathecal Baclofen Treatment for Spasticity after Acquired Brain Injury: Does Diagnosis Affect Dosing?. *PM&R*, 8(9), p.S282.

Marciniak, C., Gul, F., Ayyoub, Z., Simpson, D.M., Walker, H.W., Wimmer, M., Vilain, C. and Gracìes, J.M., 2016. Poster 308 Improvement of Spasticity, Active Movements and Active Function after Repeated Injections of AbobotulinumtoxinA (Dysport) in Adults with Spastic Paresis in the Upper Limb: Results of a Phase III Open-Label Extension Study. *PM&R*, 8(9), p.S260.

Gaebler-Spira, D.J., **Marciniak, C.M.**, Wolfman, J., Panko-Reis, J., Byrne, R., Bloom, Z.J. and Todd, A., 2016. Poster 217 Provider Barriers to Mammography Screening in Women with CP. *PM&R*, 8(9), p.S231.

Gaebler-Spira, D.J., **Marciniak, C.M.**, Bloom, Z.J., Todd, A., Wolfman, J.A., Panko-Reis, J., Roye, D.P. and Byrne, R., 2016. Poster 15 Women with Neurologic Disabilities: What are the Barriers to Breast Health Screening?. *PM&R*, 8(9), pp.S165-S166.

Marciniak, C., Brashear, A., Rubin, B., Hedera, P., Isaacson, S., Picaut, P. and Gracìes, J.M. Efficacy and Safety of AbobotulinumtoxinA (Dysport) in Adult Hemiparetic Patients with Upper Limb Spasticity Previously Treated with Botulinum toxins. *MUSCLE & NERVE* (Vol. 54, No. 3, pp. 631-631) 2016.

McAllister, P., Walker, H., **Marciniak, C.**, Edgley, S., Gul, F., Rubin, B., Simpson, D. and Picaut, P., 2016, September. AbobotulinumtoxinA (Dysport): Doses Used to Treat Upper Limb Muscles of Adults with Spasticity Participating in a Phase III Randomized, Double-Blind Placebo-Controlled Study. *MUSCLE & NERVE* Vol. 54, No. 3, pp. 631-631, 2016.

Shana Margolis: Presented "Changing Pain Medication Prescribing Practices and Pain Management Approaches", Northwestern Interdisciplinary Opioid Symposium, October 20

Laura Miller:

Kuiken TA, **Miller LA**, Turner, K, Hargrove, LJ. A comparison of pattern recognition control and direct control of a multiple degree-of-freedom transradial prosthesis. *IEEE Journal of Translational Engineering in Health and Medicine*, in press.

Miller LA and Kuiken TA (2016). Targeted Reinnervation and pattern recognition control. *The 2nd Annual All Hands Meeting, Department of Defense Osseointegration Program*, Bethesda, MD, October 27, 2016.

Maria Reese:

Casey E, **Reese M**, Okafor E, Chun D, Gagnon C, Nigl F, Dhaher YY. Influence of Menstrual Cycle and Oral Contraceptive Phase on Spinal Excitability. *PM R*. 2016 Sep 8(9):860-8.

Poster presentations at AAPMR (October 2016):

1. Prather H, Rho M, **Reese M**, Simpson S, Creighton A, Hunt D. Impairments in Sleep and Anxiety in Patients with Intra-articular, Non-arthritis Hip Pain.
2. Gross C, Rho M, Aguilar D, **Reese M**. Self-reported hip problems in professional ballet dancers: The impact on quality of life.
3. Gross C, **Reese M**. Radial stress fracture in a kettlebell competitor: A case report

Christopher Reger:

Maneypanda M., Chien G., Amorapanth R., **Reger C.**, McCormick Z. "Ultrasound guidance for the technically challenging intrathecal baclofen pump refill: Three cases and procedure description. American Journal of PM&R 2016. Sept. 99(9), pp 692-7.

Presented "Rehabilitation Principles for the Medically Complex Lower Extremity Amputee", NUPOC, September 22

ITB Workshop, AAPM&R Annual Meeting: Instructor for ITB titration programming. October 20

Poster/Abstracts, AAPM&R Annual Meeting, October 21: Maneypanda M., McCormick Z., Marciniak C., **Reger C.** "Long term intrathecal baclofen treatment for spasticity after acquired brain injury: Does diagnosis affect dosing?"; Clanton S., Maneypanda M., Goodman D., McCormick Z., **Reger C.** "Ultrasound Guided and Doppler verified baclofen pump refill"

Elliott Rouse:

Presented: Dynamic Walking Conference, June 2016, *Impedance inspired design and control*
The Ohio State University, August 2016, *The hidden mechanics of locomotion*

Presented: "The case for impedance control in wearable robotics" International Society of Electrophysiology and Kinesiology Congress, July 5-8, 2016, Chicago, IL

Shepherd MK, **Rouse EJ**. A Quasi-Passive Ankle-Foot Prosthesis with Continuously Variable Stiffness *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, in review
Azocar AF, **Rouse EJ**. Stiffness Perception During Active Ankle and Knee Movement. *IEEE Transactions on Biomedical Engineering*, in review

Shepherd MK, **Rouse EJ**. Design and Validation of a Torque-Controllable Knee Exoskeleton for Sit-to-Stand Assistance. *IEEE Transactions on Mechatronics*, in review

Lee J, Mooney LM, and **Rouse EJ**. Design and Characterization of a Quasi-Passive Pneumatic Foot-Ankle Prosthesis. *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, in review

Lee H, **Rouse EJ**, Krebs HI. Summary of Human Ankle Mechanical Impedance during Walking. *IEEE Journal of Translational Engineering in Medicine and Health*. In press.

Shepherd MK, **Rouse EJ**, Design of a Quasi-passive Ankle-Foot Prosthesis with Biomimetic, Variable Stiffness, Proceedings of the IEEE Conference on Robotics and Automation 2017. In review.

Shepherd MK, **Rouse EJ**, Design and Characterization of a Torque-Controllable Actuator for Knee Assistance during Sit-to-Stand, Proceedings of the IEEE Engineering in Medicine and Biology Conference 2016. In press.

Grants Submitted

DOD STTR Follow on: *Data Driven Intent Recognition Framework*, Submitted 6/4/16

ONR DURIP: *Robotic instrument for measuring leg stiffness to detect likelihood for injury*, Submitted 7/25/16

NIH DP2: *A new generation of soft fabric exoskeletons that unlocks the study of assistance and therapy*, Submitted 9/9/16

DOD STTR: *Passive Ankle Prosthesis with Variable Mechanics*, Submitted 10/26/16

ONR YIP: *Leg joint stiffness as a quantifiable metric for screening and rehabilitation from musculoskeletal injuries*, Submitted 11/4/16

W. Zev Rymer:

September 27. Presented "Acute Intermittent Hypoxia Enhances Neuroplasticity In Incomplete Spinal Cord Injury" at International Advisory Committee (IAC) Meeting, Center for Bionics in Seoul, Korea, September 27

Presented "Acute Intermittent Hypoxia Enhances Neuroplasticity in Incomplete Spinal Cord Injury" at Seoul National University Hospital in Seoul, Korea, September 28

Attended Cybathlon Symposium in Zurich, Switzerland, October 6

Attended Hocoma Scientific Advisory Board Meeting in Zurich, Switzerland, October 7-8

Attended Cybathlon Robotics Competition in Zurich, Switzerland, October 8

Co-presented with Dr. Arun Jayaraman: "Exoskeletons for rehabilitation & personal mobility: creating clinical evidence" at WeRob 2016 in Segovia, Spain, October 18

Presented "Identifying Spinal Lesion Site from Surface EMG Grid Recordings" by Babak Afsharipour, Milap Sandhu, Ghulam Rasool, Nina Suresh, and William Rymer at ICNR 2016 in Segovia, Spain, October 19

Presenting "Acute Intermittent Hypoxia Induces Rapid Spinal Plasticity in Quadriplegic Patients" at Neuroscience 2016 Satellite Symposium in San Diego, CA, November 11

Diane Dudas Sheehan:

Fall 2016 Small group tutor for Foundations of Clinical Ethics Class – M1 medical students, NU

9/22/16 “Neuromuscular Scoliosis Evaluation and Management” presented to PM&R fellow/ residents / students = 7 during Pediatric rotation at RIC

9/27/16 “Systems of Care & Chronic Illness in Pediatrics” presented to PM&R 3rd year residents at the Rehabilitation Institute of Chicago

10/4//16 “SMA & Arthrogryposis” presented to PM&R 3rd year residents at the Rehabilitation Institute of Chicago

10/25/16 “Comprehensive Evaluation and Practical Treatment of Children with Wounds” I presented to PM&R residents during Pediatric rotation at the Rehabilitation Institute of Chicago

RESEARCH FACULTY

Anne Deutsch:

Deutsch A. Smith L, Heinemann AW, Loft J. Quality Measures Developments for Inpatient Rehabilitation Facilities. American Congress of Rehabilitation Medicine. Chicago, IL; November 3, 2016.

American Congress of Rehabilitation Medicine Early Career Development Course. Participated in panel discussion, mentoring lunch and breakout sessions. American Congress of Rehabilitation Medicine Annual Conference, Chicago, IL; November 1, 2016.

Professional Service:

Member, Expert Panel, Skilled Nursing Facility Prospective Payment System. Convened by Acumen and funded by the Centers for Medicare and Medicaid Services, Baltimore, October 14, 2016.

Member, Expert Panel, National Quality Forum Measure IncubatorTM Multiple Sclerosis PRO-PM Strategy Session, Washington, DC: Sept 26, 2016

Member with Methodological Expertise in Performance Measures for the Stroke Performance

Measures Oversight Committee (SPOC) of the COUNCIL ON STROKE, American Stroke Association, 2016-2018

Technical Report:

Deutsch A, Palmer L, Kline T, Ignaczak M, Toth M, Lepore M. Technical Expert Panel Summary Report: Development of Functional Outcome Quality Measures for Skilled Nursing Facilities (SNFs). <https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/Downloads/SNF-Function-Quality-Measures-TEP-Summary-Report-August-2016.pdf>

Linda Ehlich-Jones:

Ehrlich-Jones, L. Systemic Lupus Erythematosus: Challenges in Diagnosis and Management at Illinois Society of Advanced Practice Nurses Midwest Conference, Lisle, IL, 10/6/16.

Gilbert AL, Lee J, **Ehrlich-Jones L**, Semanik PA, Song J, Pellegrini CA, Pinto D, Dunlop DD, & Chang RW. The Improving Motivation for Physical Activity in Arthritis Clinical Trial for Knee Osteoarthritis and Rheumatoid Arthritis. Poster presented at 2016 ACR/ARHP Annual Scientific Meeting, Washington, DC on 11/12/16-11/16/16.

Pellegrini CA, Song J, Chang R., Semanik P, Lee J, **Ehrlich-Jones L**, Pinto D, & Dunlop D. Patients less likely to lose weight following a knee replacement: Results from the Osteoarthritis Initiative. *ObesityWeek 2017*, New Orleans, LA; November 2017.

Lee J, Song J, Chang RW, Semanik PA, Pellegrini CA, **Ehrlich-Jones LS**, Pinto D, Jackson RD, & Dunlop DD. Prediction of triaxial accelerometer counts from uniaxial accelerometer counts among adults with or at risk for knee osteoarthritis: Data from the Osteoarthritis Initiative. Poster presented at 2016 ACR/ARHP Annual Scientific Meeting, Washington, DC on 11/12/16-11/16/16

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

Sherri LaVela:

LaVela SL, Kostovich C, Locatelli SM, Gosch M, Eagan A, Radonovich L. Development and initial validation of the Respirator Comfort, Wearing Experience, and Function Instrument [R-COMFI]. *Journal of Occupational and Environmental Hygiene*. In Press.

Evans C, Suda KJ, Fitzpatrick M, Poggensee L, Ramanathan S, **LaVela SL**, Burns SP, Burden and risk factors of multi-drug resistant gram-negative organisms in Veterans with spinal cord injury. New Orleans, LA. October 26-30, 2016. IDWeek 2016. Poster.

LaVela SL, Heinemann AW, Etingen B, Miskovic A, Locatelli SM, Chen D. Is care delivered to individuals with SCI/D perceived as patient-centered and equitable? Southwest Conference on Disability. Albuquerque, NM. October 5, 2016. Poster.

LaVela SL, Miskevics S, Weaver F. Factors associated with poor perceptions of cultural competence in health care received by individuals with neurological disorders/disabilities. Southwest Conference on Disability. Albuquerque, NM. October 5, 2016. Poster.

Heinemann AW, Hill JN, Etingen BE, **LaVela SL**. Self-Efficacy in Individuals with SCI/D with high versus low perceptions of mobility and fine motor function. The International Spinal Cord Society. 55th Annual Scientific Meeting. Vienna, Austria. September 14-16, 2016. Workshop presentation.

Heinemann AW, **LaVela SL**, Etingen B, Locatelli S, Miskevics S. Predictors of satisfaction with life in persons with SCI. The International Spinal Cord Society. Vienna, Austria. September 14-16, 2016. Poster.

LaVela SL, Etingen B, Locatelli S, Miskevics S, Heinemann AW. What determines low satisfaction with life in persons with SCI/D? Educational conference of the Academy of Spinal Cord Injury Professionals. Nashville, TN. 2016. September 4-7, 2016. Platform.

LaVela SL, Balbale SN, Hill JN. Experience of using Photovoice in individuals with spinal cord injuries/disorders. Educational conference of the Academy of Spinal Cord Injury Professionals. Nashville, TN. 2016. September 4-7, 2016. Platform.

Etingen B, Locatelli SM, Miskevics S, **LaVela SL**. Psychosocial factors associated with pain interference in persons with SCI/D. Educational conference of the Academy of Spinal Cord Injury Professionals. September 4-7, 2016. Nashville, TN. 2016. Platform.

Etingen B, Locatelli SM, Miskevics S, **LaVela SL**. Participation in spinal cord injured individuals with and without PTSD. Educational conference of the Academy of Spinal Cord Injury Professionals. September 4-7, 2016. Nashville, TN. 2016. Platform.

LaVela SL, Etingen B, Miskevics S. Self-care behaviors in persons with SCI/D: resilience and other factors. Educational conference of the Academy of Spinal Cord Injury Professionals. September 4-7, 2016. Nashville, TN. 2016. Platform.

Hill JN, Etingen B, Miskevics S, **LaVela SL**. Self-Efficacy in individuals with SCI/D with high versus low perceptions of mobility and fine-motor function. Paralyzed Veterans of America Summit 2016: Delivering Excellence – Achieving State of the Art Healthcare. September 1, 2016. Orlando, FL. Platform.

Hill JN, Balbale S, **LaVela SL**. Completing the Definition: Understanding Factors Impacting Function Using Pictures and Narratives from Individuals with SCI. Paralyzed Veterans of America Summit 2016 – Achieving State of the Art Healthcare. September 1, 2016. Orlando, FL. Platform.

Evans C, Suda KJ, Fitzpatrick M, Poggensee L, Ramanathan S, **LaVela SL**, Burns SP. Multi-drug Resistant Gram-Negative Organisms: Burden, Risk Factors, and Outcomes in Veterans with Spinal Cord Injury. Paralyzed Veterans of America Summit 2016. Orlando, FL. September 1, 2016. Platform.

Ramanathan S, Suda KJ, Fitzpatrick M, Poggensee L, **LaVela SL**, Burns SP, Evans C. Multi-drug resistant Acinetobacter in Veterans with Spinal cord injuries & Disorders. Paralyzed Veterans of America Summit 2016. Orlando, FL. September 1, 2016. Poster.

LaVela SL, Etingen B, Miskevics S. Factors associated with self-care behaviors in persons with SCI/D: Does resilience play a role? Paralyzed Veterans of America Summit 2016. Orlando, FL. September 1, 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. September 1, 2016. Paralyzed Veterans of America Summit 2016. Platform.

Etingen B, Locatelli SM, Miskevics S, **LaVela SL**. The relationship between pain interference and psychosocial well-being after injury among Veterans living with SCI/D. Orlando, FL. September 1, 2016. Paralyzed Veterans of America Summit 2016. Platform.

Etingen B, Locatelli SM, Miskevics S, **LaVela SL**. Social participation among Veterans with SCI/D: the impact of post-traumatic stress disorder. Paralyzed Veterans of America Summit 2016. Orlando, FL. September 1, 2016. Platform.

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. September 1, 2016. Paralyzed Veterans of America Summit 2016. Platform.

Locatelli SM, Etingen B, Miskevics S, **LaVela SL**. Effect of Environment on Participation in Spinal Cord Injuries/Disorders: Resilience, Grief, and Self-Efficacy as Mediators. Paralyzed Veterans of America Summit 2016. Orlando, FL. September 1, 2016. Platform.

Tommi Raji received a Falk Medical research Trust Catalyst Award

Annie Simon:

Simon AM, Ingraham KA, Spanias J, Young AJ, Finucane SB, Halsne EG, and Hargrove LJ. Delaying ambulation mode transition decisions improves accuracy of a flexible control system for powered knee-ankle prosthesis. *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, in press.

Conference Papers:

Simon, A, Spanias, J, Ingraham, K, **Hargrove LJ**. "Delaying ambulation mode transitions in a powered knee-ankle prosthesis." *38th International conference of the IEEE Engineering in Medicine and Biology Society, August 16-20, Orlando, FL.*

Spanias, J, Simon, A, Perreault, E., **Hargrove LJ**. "Preliminary results for an adaptive pattern recognition system for novel users using a powered lower limb prosthesis" *38th International conference of the IEEE Engineering in Medicine and Biology Society, August 16-20, Orlando, FL.*

NUPOC

Publications:

"NUPOC Launches the NU-FlexSIV Socket." Industry Review, O & P Edge, October, 2016, pp. 10.

"NUPOC Launches the NU-FlexSIV Socket," http://www.oandp.com/articles/NEWS_2016-08-25_01.asp

"External Facilitation Could Aid Clinics' Quality Improvement Measures." O&P News, Fall 2016.

"New socket design could improve prosthesis fit, comfort." Healio O&P News American Orthotic and Prosthetic Association National Assembly Meeting News Coverage, September 2016. http://www.healio.com/orthotics-prosthetics/prosthetics/news/online/%7Bc95e23d8-ef32-4cab-a5fd-87c587503904%7D/new-socket-design-could-improve-prosthesis-fit-comfort?utm_source=maestro&utm_medium=email&utm_campaign=orthotics%20prosthetics%20news

Major, M.J., Raghavan, P. and **Gard, S.A.** (2016). Assessing a Low-Cost Accelerometer-Based Technique to Estimate Spatial Gait Parameters of Lower-Limb Prosthesis Users. *Prosthetics & Orthotics International*, 40(5), 643-648.

"Get Involved in O&P Research: With the need for outcome and validation studies in O&P, boosting patient enrollment is more important than ever." O&P News, October 2016. Including interviews with **Matthew Major** and **Steven Gard**.

Caldwell R, Fatone S (in press) Technique for Perforating a Prosthetic Liner to Expel Sweat. *Journal of Prosthetics and Orthotics*.

Fatone S, Johnson WB, **Tran L**, Tucker K, Mowrer C, **Caldwell R** (in press) Quantification of Rectifications for Northwestern University Flexible Sub-Ischial Vacuum (NU-FlexSIV) Socket. *Prosthetics & Orthotics International*.

Presentations:

Stefania Fatone, PhD, BPO (Hons), Michael Dillon, PhD, BPO (Hons) and Tammy Hoffman, PhD. "Outcomes of Partial Foot Amputation Can Inform Difficult Decisions about Amputation Surgery Using a Shared Decision-Making Approach." Symposium Presentation, American Orthotic and Prosthetic Association (AOPA) National Assembly held in Boston, MA from September 8 to 11, 2016.

Stefania Fatone, PhD, BPO (Hons), **Ryan Caldwell, CP**. "Development of the Northwestern University Flexible Sub-Ischial Vacuum (NU-FlexSIV) Socket for Persons with Transfemoral Amputation." Free Paper Session on "Treating the Lower Limb Amputee," American Orthotic and Prosthetic Association (AOPA) National Assembly held in Boston, MA from September 8 to 11, 2016.

Stefania Fatone, PhD, BPO (Hons), Michael Dillon, PhD, BPO(Hons), **Matthew Major, PhD**, and Brian Kaluf, CP. "How Well Can the Amputee Mobility Predictor and Basic Patient Demographics Predict the Medicare Functional Classification Level (K-level) in People with Transfemoral and Transtibial Amputation?" Poster Session, American Orthotic and Prosthetic Association (AOPA) National Assembly held in Boston, MA from September 8 to 11, 2016.

Chris Robinson, MS, MBA, CPO, ATC, FAAOP(D), Ashley Mullen, MS, CPO, and Jonathan Day, MS, CPO. "Approved Clinical Mentor Training Workshop" One-Day Seminar, American Orthotic and Prosthetic Association (AOPA) National Assembly held in Boston, MA from September 8 to 11, 2016.

Duncan, J.C & Bruce, A. "Technology, globalization, and disability." Accentuate the Positive, Redefining Education, Practice and Research colloquium sponsored Rehabilitation Counseling Coalition. Memphis, TN September 16-18, 2016.

Oswald, G., & **Duncan, J.C.** "Research Opportunities and Necessities." Accentuate the Positive, Redefining Education, Practice and Research colloquium sponsored Rehabilitation Counseling Coalition. Memphis, TN September 16-18, 2016.

Stefania Fatone, PhD, BPO (Hons) "Development of Sub-Ischial Prosthetic Sockets with Vacuum-Assisted Suspension for Highly Active Persons with Transfemoral Amputations." U.S. Army Medical Research and Materiel Command Clinical and Rehabilitative Medicine Research Program Socket Technology and Related Limb Health In-Progress Review, September 27, 2016, Ft. Detrick, Maryland.

Stefania Fatone, PhD, BPO (Hons). "The Final Frontier: Developments in Transfemoral Sockets." Keynote Lecture, ISPO European Congress on Prosthetics and Orthotics in Rotterdam, The Netherlands, on October 6, 2016.

Stefania Fatone, PhD, BPO (Hons), Lily Tran, MS, Ryan Caldwell, CP/L, and Matthew Quigley. "Stakeholder Input on the Development of a Residual Limb Monitoring System." Presented at ISPO European Congress on Prosthetics and Orthotics in Rotterdam, The Netherlands, on October 6, 2016.

Stefania Fatone, PhD, BPO (Hons) "Orthotic Management of Stroke." Invited Speaker at "Evidensbaseret ortosebehandling efter apopleksi" Seminar sponsored by Ortos in Valby, Denmark on October 13, 2016.

Lipschutz, R. "Advances in Neural Control of Prostheses." Northern Plains Chapter of the American Academy of Orthotists and Prosthetists, Vadnais Heights, MN October 14, 2016.

Tran L, Han S, Caldwell R, Rogers J, Coleman T, Fatone S "Ability of epidermal sensors to measure lower limb temperature during activity with a prosthesis simulator." Midwest Chapter of the American Academy of Orthotists and Prosthetists, November 3-5, 2016, Rosemont, Illinois.

Caldwell R, Fatone S "Where does the weight go? Effect of Interface Components on Residual Limb Weight-Bearing Tolerance in Transfemoral Prosthesis Users." Midwest Chapter of the American Academy of Orthotists and Prosthetists, November 3-5, 2016, Rosemont, Illinois.

Major M, Borrenpohl D, Kaluf B. "Survey of U.S. Practitioners on the Validity of the Medicare Functional Classification Level System and Utility of Clinical Outcome Measures for

Aiding K-Level Assignment.” Midwest Chapter of the American Academy of Orthotists and Prosthetists, November 3-5, 2016, Rosemont, Illinois.

Chris Robinson, MS, MBA, CPO, ATC, FAAOP(D), Ashley Mullen, MS, CPO, and **Michael Cavanaugh, CPO**. “Approved Clinical Mentor Training Workshop” One-Day Seminar, Midwest Chapter of the American Academy of Orthotists and Prosthetists, November 3-5, 2016, Rosemont, Illinois.

Stefania Fatone, PhD, BPO(Hons) “Flexible Sub-ischial Vacuum Socket for Transfemoral Amputees” Plenary Lecture, Asian Prosthetic and Orthotic Scientific Meeting 2016, November 4-6, Seoul, South Korea.

Stefania Fatone, PhD, BPO(Hons) “Flexible Sub-ischial Vacuum Socket for Transfemoral Amputees” KOREC Workshop, November 7, 2016, Seoul, South Korea.

Major M, Kluger D, **Fatone S**, **Gard S**. “The Effect of Trunk Flexion on Lower Limb Kinetics of Able-Bodied Gait”. The Japan Society for the Promotion of Sciences, Japan-US Science Forum in Boston, Changing the World through Japan’s Scientific Endeavors: Japan’s Rapidly Aging Society, November 12, Cambridge, MA.

Laboratory Visits/Events:

NUPOC collaborated with the National Commission on Orthotics & Prosthetics Education (NCOPE) to participate in Health Professions Week (HPW) September 26 through 30, 2016, educating students about opportunities in P&O and offering person-to-person conversations with **Anna Avakian-Li, CPO**, **John W. Michael, MEd, CPO**, and **Melinda Thorpe, CPO**; and “Talk to an O&P Professional in Illinois” with **John Brinkmann, MA, CPO, FAAOP(D)**, **John W. Michael, MEd, CPO**, and **Chris Robinson, CPO, MS, MBA, ATC, FAAOP(D)**. **R. J. Garrick, PhD**, led the outreach activities and facilitated the collaboration with NCOPE.

Dr. Stefania Fatone, PhD, BPO (Hons) and Ryan Caldwell, CP, taught the Northwestern University Flexible Sub-Ischial Vacuum (NU-FlexSIV) Socket workshop to 10 prosthetists from Ortos in Brondby, Denmark on October 11 and 12. The course was sponsored by Ortos through an agreement with Northwestern University.

Dr. Stefania Fatone, PhD, BPO (Hons) and Ryan Caldwell, CP, taught the Northwestern University Flexible Sub-Ischial Vacuum (NU-FlexSIV) Socket workshop to prosthetists from Ossur Americas in Orlando, Florida on November 18 and 19. The course was sponsored by Ossur through an agreement with Northwestern University.

Grant Submissions:

Steven Gard, PhD, was invited to submit an application entitled “Development and Evaluation of an Improved Prosthetic Foot/Shoe Interface” to the Department of Defense on November 16, 2016, in response to the FY16 Orthotics and Prosthetics Outcomes Research Program (OPORP) Prosthetics Outcomes Research Award (PORA).

Steven Gard, PhD, and Yeongchi Wu, MD, were invited to submit an application entitled “Comparison of Dilatancy, Plaster and CAD-CAM Approaches for Transtibial Socket Fabrication” to the Department of Defense on November 16, 2016, in response to the FY15 Orthotics and Prosthetics Outcomes Research Program (OPORP) Prosthetics Outcomes Research Award (PORA).

Steven Gard, PhD, was a co-investigator on an application entitled, “Bionic Prosthetic Foot with Passive Propulsion Joints” that was submitted to the Department of Defense STTR program on October 26, 2016 by Dr. Jing Zhao, CEO of Agiltron Incorporated.

Matthew Major, PhD, was invited to submit an application entitled “Women’s-Specific Footwear with Prosthetic Feet” to the Department of Defense on November 16, 2016, in response to the FY16 Orthotics and Prosthetics Outcomes Research Program (OPORP) Prosthetics Outcomes Research Award (PORA).

Matthew Major, PhD, was invited to submit an application entitled “Targeted Balance-Confidence Interventions to Increase Social Activity in Users of Lower-limb Prostheses” to the Department of Defense on November 16, 2016, in response to the FY16 Orthotics and Prosthetics Outcomes Research Program (OPORP) Prosthetics Outcomes Research Award (PORA).

Matthew Major, PhD, was invited to submit an application entitled “Connecting Mechanical to Biomechanical Performance of Prosthetic Feet to Design Customized, Passive Devices that Provide Improved Mobility” to the Department of Defense on December 7, 2016, in response to the FY16 Peer Reviewed Orthopaedic Research Program (PRORP) Applied Research Award (ARA).

OTHER FACULTY

Rosemarie B. King served as an abstract reviewer for the 2017 ISC Conference