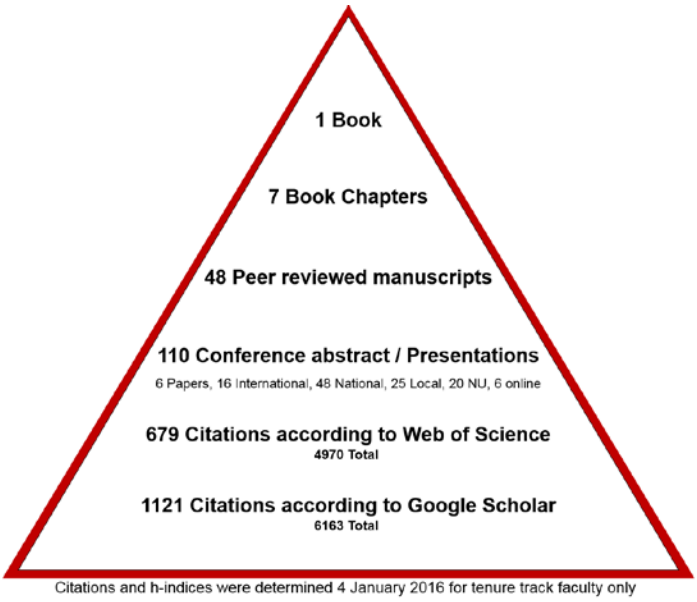
Northeastern University
Bouvé College *of* Health Sciences

Physical Therapy, Movement, and Rehabilitation Sciences

2016 Annual Research Report

31 May 2016



Research Productivity for 2015

Mission

The Department of Physical Therapy, Movement and Rehabilitation Sciences' research mission is to build the evidence for best practices to maintain and improve the health and wellbeing of the local, national, and global community members.

Contents

Highlights from 2015

The Department of Physical Therapy, Movement, and Rehabilitation Sciences had an excellent year with regard to research in 2015. The department continued to grow with new faculty and research facilities. Researchers were very productive publishing their work and submitting new grants applications to expand our current activities in upcoming years. Highlights from the 2015 calendar year include

- Over 48 peer reviewed journal publications
- Over 110 peer reviewed conference abstracts, papers, and presentations
- Over 679 citations of works by tenure-track faculty with an average H-index of 8.1
- $6.92 million in direct costs for multi-year grants submitted to external agencies
- $1.45 million in direct costs new multi-year grants awarded.
- $1.44 million in direct costs for internally & externally funded research activities
- Three new tenure-track faculty

Description of research program

At the heart of the research is the success of the department's faculty and their resources. The department has ten tenure-track and seventeen clinical faculty devoted to the department's research mission. The department has over 4,900 square feet of research laboratories mostly located within Robinson and Richards Hall equipped with the state of the art research equipment. Equipment include systems to measure human motion, posture and force, neurophysiology, muscle and tissue physiology, and musculoskeletal structure and include intervention systems such as rehabilitation robots and office ergonomic furniture. Other capabilities include survey and population data base resources and software.

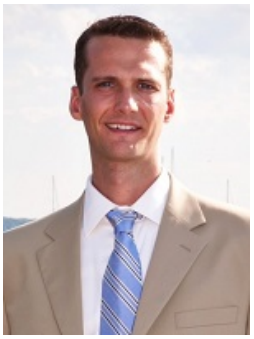
Growth with new faculty!

The department's research expanded with the appointment of three new members of our faculty, Drs. Danielle Levac, Gene Tunik, and Josh Stefanik.

Danielle Levac, BSc.PT, MSc, PhD Dr. Levac is a physical therapist and Assistant Professor in the Department of Physical Therapy, Movement and Rehabilitation Sciences at Bouvé College of Health Sciences, Northeastern University. She directs the Rehabilitation Games and Virtual Reality (ReGameVR) Laboratory. She joined the faculty in January of 2015. She received her Ph.D. in rehabilitation sciences from the McMaster University in Hamilton Ontario.

Dr. Levac's research interests stem from her clinical practice experience as a pediatric physical therapist searching for rehabilitation strategies that effectively engage client participation and promote motor learning: namely, permanent, transferable and generalizable changes in motor skill capabilities. She is motivated by the potential of virtual reality (VR) and active video gaming systems to promote motor learning in pediatric and adult neurological populations. VR systems that motivate users to control games by means of movement and posture have been embraced within

rehabilitation and appear to challenge user's motor skills. Although these systems incorporate key motor learning principles known to be critical for rehabilitation (such as task-oriented training and multisensory feedback), we know very little about how therapists can use this technology to promote motor learning. Resources to support the integration of VR systems into clinical practice remain scarce.



Joshua Stefanik, MSPT, PhD Joshua Stefanik is an Assistant Professor of Physical Therapy, Movement and Rehabilitation Sciences. He joined the faculty in September 2015. Prior to coming to Northeastern he was a Research Assistant Professor of Physical Therapy and Athletic Training at Boston University. He received his M.S. in Physical Therapy from Northeastern and his PhD in Anatomy and Neurobiology from Boston University School of Medicine where he also did a postdoctoral fellowship in Clinical Epidemiology. Josh's primary research interests are in the field of knee (patellofemoral joint) osteoarthritis, knee pain and lower extremity biomechanics. His ultimate goal is to develop novel and effective rehabilitation interventions for older individuals with knee osteoarthritis.

Eugene Tunik, PhD, PT Gene Tunik is joining the college as an Associate Professor in the Department of Physical Therapy, Movement and Rehabilitation Sciences. He joined the faculty in September 2015. Prior to coming to Northeastern, he was an Associate Professor at the Department of Rehabilitation and Movement Science at Rutgers University. Gene received his B.S. in Physical Therapy from Northeastern University, his PhD in Neuroscience from Rutgers University, and completed a postdoctoral fellowship at Dartmouth. Gene's primary research interest is in the study of brain mechanisms involved in human motor control, motor learning, and motor recovery from disease.

New grants!

Does narrative feedback enhance motor learning of a virtual balance task in children with cerebral palsy?

Danielle Levac and Amy Lu (Bouvé College of Health Sciences and College of Arts, Media and Design) were awarded a TIER 1 Interdisciplinary Research Award for their project entitled: Does narrative feedback enhance motor learning of a virtual balance task in children with cerebral palsy? Cerebral palsy is the primary cause of childhood disability in the United States, leading to balance impairments that interfere with functional mobility and impact a child's ability to learn new skills. The feedback provided by physical therapists during motor skill learning is important because it can help children plan movements and detect errors. Feedback should be salient and motivating to enhance adherence in abundant practice trials. However, little is known about the best ways to provide feedback to children with CP for effective motor learning. Since we know that many children are attracted to fantasy narratives, we want to know whether receiving narrative feedback might help children learn a new movement task better than regular feedback. This research project will compare the effects on retention and transfer of learning of two types of feedback provided in a virtual environment during learning of a new virtual reality (VR) balance task: narrative feedback (in the context of a story related to the VR task) and regular feedback. The goal is to establish proof of concept and lead to further research studies in this area. VR is an increasingly popular physical therapy intervention for children with CP, and our

partnership with VR game developers can translate the findings into practice to create VR games for children with CP that incorporate narrative feedback conditions.

Predictability in Complex Object Control (Co-I, CJ Hasson, PI: Dagmar Sternad).

Assistant Professor CJ Hasson is part of a research team examining motor learning strategy with better understanding the movement dynamics. They were awarded a 5-year R01 NIH grant this past year.

Manipulation of complex objects such as transporting a cup of coffee without spilling creates complex interaction forces that humans need to predict, preempt, and compensate for. Using a virtual experimental set-up that simulates the task of "carrying a cup of coffee" and novel analysis approaches, this research aims to show that humans learn control strategies that make object dynamics predictable. This research will help gain insights into many neurological diseases that compromise manual dexterity, such as dystonia, multiple sclerosis, and apraxia, including aging. The grant is for five years.

Planning and Updating in Frontoparietal Networks for Grasping (PI Gene Tunik)

Associate Professor Gene Tunik brings with him an R01 funded by the NIH examining barin networks with grasping activities. A number of brain disorders caused by cortical lesions due to stroke or trauma can be explained by abnormalities in integration of sensory information and motor commands. This project uses brain imaging and non-invasive brain stimulation, combined with novel perturbations of grasping movements with robotics and virtual environments to study the roles played by frontoparietal brain areas in different stages of sensorimotor integration and to identify specific contributions of brain networks subserving goal-directed grasping. This work will advance our understanding of brain-behavior interactions as it impact clinicians and basic scientists, in line with the mission of the NIH, and direct relevance to public health.

Identifying cases of patellofemoral joint osteoarthritis & their hip impairments Rheumatology Research Foundation

The goal of this proposal is to determine criteria that can be used to identify individuals with patellofemoral joint osteoarthritis (PFJ OA) and then, using these criteria to select patients, to quantify strength and movement patterns in subjects with PFJ OA. We will begin using data from the Clinical Assessment Study Knee (CAS-K)[3, 6, 10] . CAS-K is a prospective study of knee pain and OA in the general population in the United Kingdom and offers a unique advantage of having radiographs of the knee and information on clinical examination measures (e.g. joint crepitus, PFJ compression, tenderness around the knee joint, etc.). Additionally, to identify strength and movement impairments (potential rehabilitation targets), subjects with PFJ OA (and controls without OA) will be recruited locally from the community, physician and physical therapy clinics and other ongoing studies; our group has recently successfully completed a PFJ OA knee bracing study[24] , demonstrating our ability to successfully recruit such subjects. Subjects will undergo hip muscle strength assessment and motion analysis with joint kinematic data while performing functional activities (gait, stairs, sit to stand and stand to sit). Our specific aims are to: Specific Aim 1: Determine the diagnostic utility of clinical examination findings, pain location and painful activities to identify PFJ OA Hypothesis 1: Using clinical examination findings, in additional to self-reported pain location and with activities, will better discriminate knees with primarily PFJ OA vs. primarily TFJ/No OA Specific Aim 2: Quantify hip muscle strength in subjects with PFJ OA and controls Hypothesis 2: Subjects with PFJ OA will have lower hip extensor, abductor and external rotator muscle strength compared with control subjects Specific Aim 3: Quantify trunk, pelvis and hip kinematics during functional activities in subjects with PFJ OA and controls Hypothesis 3: Subjects with PFJ OA will demonstrate higher peak ipsilateral trunk lean, contralateral pelvic drop, hip internal rotation and hip adduction during functional activities compared with control subjects

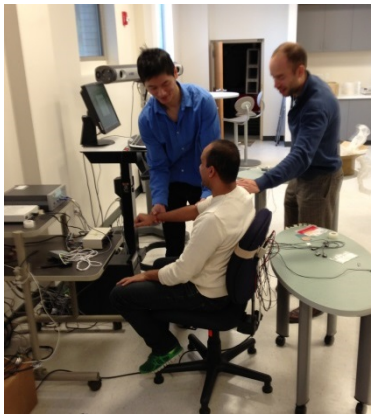
APPENDIX

Contents

Description of Laboratories

Occupational Biomechanics and Ergonomics Laboratory (Jack Dennerlein)

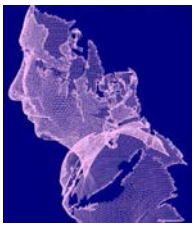
001 Robinson Hall 1190 square feet



The Occupational Biomechanics and Ergonomics Laboratory research aims to prevent work-related musculoskeletal disorders by understanding injury mechanisms through laboratory and field studies that utilize biomechanics, neuromuscular, exposure-response, and intervention study designs and methods. Located on the ground floor of Robinson Hall, this space contains a state of the art office space for research staff and trainees and a human movement and biomechanics laboratory space, both approximately 600 square feet. The flexible design of biomechanics laboratory space allows for a range of experiments investigating thumb movements while using mobile computing technology to the ergonomics of dynamic office workstation designs. The laboratory contains equipment to measure human motion and posture, surface electromyography, and applied forces. Human motion equipment includes Northern Digital Optotrak system and Ascension Technology Mini-Bird systems. Electromyography equipment include a 12 channel Delsys and an 8 channel wireless Mega systems. Load cells to measure force include custom made force plates for computing to ATI 3-axis force-torque sensors. www.neu.edu/ergonomics

Center for Cancer Survivorship Studies (Ann Marie Flores)

406 Robinson Hall 320 square feet

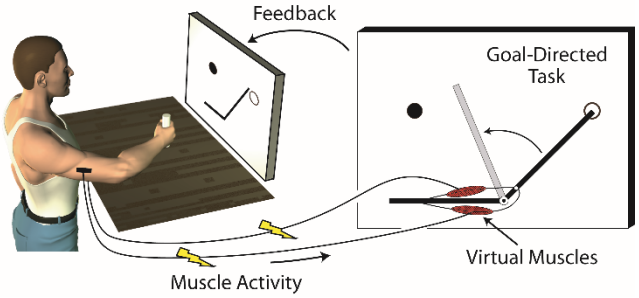


The mission of the center is to describe and evaluate issues of cancer survivorship that affect physical and functional well-being and quality of life after a cancer diagnosis with special emphasis on minorities, the poor and medically underserved. The center is also devoted to the development and testing of physical therapy and technological interventions to improve physical and functional well-being and quality of life after a cancer diagnosis. The center encourages collaborative research that includes the fields of physical therapy, biostatistics, public health, epidemiology, sociology, biomedical & biomechanical engineering, psychology, nursing, oncology (surgical, medical and radiation), pharmacy sciences, cancer, and cell biology.

Neuromotor Systems Laboratory (C.J. Hasson)

426 Richards Hall 700 square feet

The goal of the Neuromotor Systems Laboratory is to understand how the nervous system learns, interacts with, and takes advantage of the properties of the musculoskeletal system and the external environment to achieve task goals. They are particularly interested in understanding how age-related changes in the neuromuscular system contribute to decrements in movement performance and stability. The laboratory's larger room will contain an isolated experimental room and a separate office area for research staff and student activities. The experimental room will house an electromyography system (records muscle activity), a high-performance robotic arm, and high-performance computers for



modeling, simulation, and data analysis. This equipment will be used to perform human motor control and learning experiments. A separate room will house Dr. Hasson's office and a small workshop that will be used to fabricate custom apparatuses and maintain experimental equipment. http://www.neu.edu/neuromotorsystemslab/

Teaching and Learning Innovation Program (Lorna Hayward)

Dr. Hayward's research centers on the scholarship of teaching and learning as it relates to student learning, cultural competency, professional role formation and novice to expert transitions. Dr. Hayward designs and examines educational models that involve the use of technology, standardized patient interactions, and experiential education in physical therapist students. Dr. Hayward's research is currently supported by the Kenneth B. Schwartz Center and the Wellesley Village Church. http://www.northeastern.edu/lornahayward.

Rehabilitation Games & Virtual Reality (ReGame VR) Laboratory (Danielle Levac)
402 Robinson Hall 500 Square Feet

The ReGameVR lab focuses on promoting the sustainable, evidence-based integration of virtual reality (VR) and active video gaming systems into rehabilitation. We explore how VR-based therapy can improve motor learning, balance, functional mobility and participation in children and adults with neuromotor impairments. We evaluate motor learning paradigms in virtual environments to understand how task practice conditions impact motor learning processes and outcomes. Our mission is to produce clinically-relevant, high-quality evidence in the field of virtual rehabilitation. A key goal is to partner with clinicians to create user-friendly knowledge translation resources that facilitate the integration of VR and active video gaming into clinical practice. Specifically, we conduct research to: Understand how VR systems can exploit key motor learning principles known to be critical for rehabilitation (such as motivation, task-oriented training and multisensory feedback) and create transfer-oriented practice conditions. Evaluate motor learning research paradigms in virtual environments to explore how differing task practice conditions impact motor learning outcomes. Develop and evaluate the effectiveness of VR systems and active video games that promote motor learning and functional recovery from neurological impairments. Create knowledge translation resources for therapists interested in integrating VR and gaming systems into clinical practice. http://www.northeastern.edu/regamevrlab/

Rehabilitation and Epidemiology Trainee Program (Maura D. Iversen)

The mission of the Rehabilitation and Clinical Epidemiology Trainee Program is to provide students with exposure to clinical translational research in the area of rehabilitation sciences. A central focus of our research is the design, evaluation and implementation of behavioral and rehabilitation interventions to improve health outcomes in persons with arthritis. Specific areas of expertise include studies of persons with rheumatoid arthritis, systemic lupus erythematosus, spinal stenosis and osteoporosis. Dr. Iversen's work is /has been funded by the National

Institutes of Health, the Research & Education Foundation, Foundation for Physical Therapy, the Arthritis Foundation and Farnsworth Foundation.

Lab for Movement Neuroscience (Gene Tunik)

404 Robinson 400 Square Feet

Research in this lab is geared toward understanding the neural processes that govern perception and action in health and disease. A central goal is to translate these principles of neuroscience toward improving delivery of rehabilitative therapies for patients with disordered movement. A number of approaches are used to probe these issues, including functional magnetic resonance imaging, transcranial magnetic stimulation, psychophysics and kinematics analyses, and patient-based paradigms. http://www.northeastern.edu/tuniklab/

Neurophysiology Laboratory (Robert Sikes)

Mugar Hall 300 Square Feet

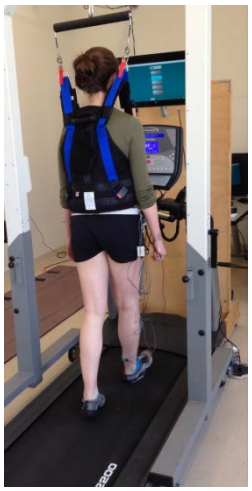
The Neurophysiology Laboratory of the Department of Physical Therapy explores the role of limbic system brain structures in pain and stress. The lab conducts pre-clinical electrophysiological experiments using animal models of cutaneous and visceral pain. This facility is one of very few that records simultaneous neuron activity at multiple levels of the pain transmission network and is part of a multidiscipline collaboration with labs at Northeastern and Boston University Medical School which conduct the brain imaging and behavior testing of these animals. The lab is located in 319 Mugar Building which provides close proximity to the animal facilities and brain imaging center. With 300 sq-ft the lab has adequate space for neurophysiological recording in small animals, surgical procedures, histological processing, light microscopy and preliminary data analysis. The lab is equipped with state of art neurophysiological recording, stereotaxic micropositioning, stimulus control and physiological monitoring systems. For histology there is a Nikon Optiphot microscope and a microtome for tissue preparation. There are multiple computer systems including a server that provides access for remote data analysis. Additional equipment includes a fume-hood, flammable storage cabinet, refrigerator and drying oven.

Musculoskeletal Epidemiology and Biomechanics Laboratory (Joshua Stefanik)

404 Robinson Hall, 600 Square Feet

The goal of the Musculoskeletal Epidemiology and Biomechanics Laboratory is to better understand risk factors, mechanisms and pathomechanics related to lower extremity musculoskeletal disorders, especially knee osteoarthritis (OA). The ultimate goal of the laboratory is to provide evidence for and to design rehabilitation treatments for knee OA. Studies in the laboratory include projects within large epidemiologic studies of knee OA (e.g.,

The Multicenter Osteoarthritis Study and The Osteoarthritis Initiative). Additionally, to better understand how older individuals with knee OA move, three-dimensional motion analysis studies are performed in collaboration with the NU Action Laboratory.



Laboratory for Locomotion Research (Sheng-Che Yan)

460 Richards Hall, 750 Square Feet

The goals of Laboratory for Locomotion Research are to: (a) understand how the central nervous system achieves sensorimotor control during gait; (b) develop and test gait rehabilitation programs for patients with sensorimotor control problems. The lab is located in the 4th floor of the university's Richards Hall and has a total space of 600 ft2. A separate office (150 ft2) is adjacent to the lab that will be served as an examination room for healthy and patient subjects. The lab will be equipped with state of the art equipment and software for gait analysis.

Publications

Books

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Book Chapters

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2. Corkery, M. (in press). *Lumbar Spinal Stenosis:A Comprehensive Review for Rehabilitation Professionals, Updated 1st Edition.* West Bridgewater, MA: Western Schools. www.westernschools.com
3. Dumas, H., Golub-Victor, A. In Ann VanSant (Ed.), *Commentary on: Reliability and Validity of "Timed Floor to Stand Test - Natural" in School Aged Children* (2nd ed., vol. 27, pp. 1). Philadelphia, PA: Pediatric Physical Therapy.
4. Golub-Victor, A., Bliner Rosenberg, Y. In Ann VanSant (Ed.), *Current evidence for school based physical therapists' screening and examination of children with a history of otitis media with effusion: A literature review* (1st ed., vol. 27). Pediatric Physical Therapy.
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Inpatient Environment: A Qualitative Study. *Physical Therapy, 95*(2), 1-14. https://www.ncbi.nlm.nih.gov/pubmed/25234275

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33. Sparer, E. H., Herrick, R. F., Dennerlein, J. T. (2015). Development of a safety communication and recognition program for construction. *New solutions : a journal of environmental and occupational health policy : NS, 25*(1), 42-58. https://www.ncbi.nlm.nih.gov/pubmed/25815741
34. Sparer, E. H., Okechukwu, C. A., Manjourides, J., Herrick, R. F., Katz, J. N., Dennerlein, J. T. (2015). Length of time spent working on a commercial construction site and the associations with worker characteristics. *American journal of industrial medicine, 58*(9), 964-73. https://www.ncbi.nlm.nih.gov/pubmed/26122700
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36. Stefanik, J. J., Gross, K. D., Guermazi, A., Felson, D. T., Roemer, F. W., Zhang, Y., Niu, J., Segal, N. A., Lewis, C. E., Nevitt, M., Neogi, T. (2015). The relation of MRI-detected structural damage in the medial and lateral patellofemoral joint to knee pain: the Multicenter and Framingham Osteoarthritis Studies. *Osteoarthritis and cartilage, 23*(4), 565- 70 https://www.ncbi.nlm.nih.gov/pubmed/25575967
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38. Tarsi, L., Corkery, M. (2015). Rehabilitation and Therapy Goals for Scleroderma and Acroosteolysis. *The Rheumatologist*. http://www.the-rheumatologist.org/view/index.html
39. Trudeau, M. B., Asakawa, D. S., Jindrich, D. L., Dennerlein, J. T. (2016). Two-handed grip on a mobile phone affords greater thumb motor performance, decreased variability, and a more extended thumb posture than a one-handed grip. *Applied ergonomics, 52*, 24-8. https://www.ncbi.nlm.nih.gov/pubmed/26360191
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41. Van Eerd, D., Munhall, C., Irvin, E., Rempel, D., Brewer, S., van der Beek, A. J., Dennerlein, J. T., Tullar, J., Skivington, K., Pinion, C., Amick, B. (2016). Effectiveness of workplace interventions in the prevention of upper extremity musculoskeletal disorders

and symptoms: an update of the evidence. *Occupational and environmental medicine, 73*(1), 62-70. https://www.ncbi.nlm.nih.gov/pubmed/26552695

42. Von Heideken J, Kiami S, Iversen MD. A Prospective, Randomized Controlled Trial to Evaluate the Effect of Smart Glasses on Vestibular Examination Skills. *BMJ Innovations* http://innovations.bmj.com/content/early/2016/03/30/bmjinnov-2015-000094.abstract
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44. Yen, S.-C., Chui, K. K., Markowski, A. M., Fitzpatrick, D. F., Wang, Y.-C., Corkery, M. (2015). Lumbar spine manual therapy for aging and older adults. *Topics in Geriatric Rehabilitation, 31*(3), 199–202. http://journals.lww.com/topicsingeriatricrehabilitation/Abstract/2015/07000/Lumbar_Spine_Manual_Therapy_for_Aging_and_Older.5.aspx
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47. Yen, S.-C., Schmit, B. D., Wu, M. (2015). Using swing resistance and assistance to improve gait symmetry in individuals post-stroke. *Human Movement Science, 42*, 212–224. https://www.ncbi.nlm.nih.gov/pubmed/26066783
48. Zhang, M., Sparer, E. H., Murphy, L. A., Dennerlein, J. T., Fang, D., Katz, J. N., Caban-Martinez, A. J. (2015). Development and validation of a fatigue assessment scale for U.S. construction workers. *American journal of industrial medicine, 58*(2), 220-8. https://www.ncbi.nlm.nih.gov/pubmed/25603944

Conference Papers

1. Dennerlein, J. T., Lin, M. Y. (2015). *A Psychophysical Protocol to Provide Ergonomic Recommendations for Standing Computer Workstation Setup*. Santa Monica, CA: Proceedings of the Human Factors and Ergonomics Society's 58th Annual Meeting.
2. Franchi, G., Viereck, U., Platt, R. J., Yen, S.-C., Hasson, C. J. (2015). An arm for a leg: Adapting a robotic arm for gait rehabilitation. *Engineering in Medicine and Biology Society (EMBC), 2015 37th Annual International Conference of the IEEE* (pp. 3929–3932).
3. Franchi, G., Viereck, U., Platt, R., Yen, S. C., & Hasson, C. J. (2015). An arm for a leg: Adapting a robotic arm for gait rehabilitation. In: Engineering in Medicine and Biology Society (EMBC); 37th Annual International Conference of the IEEE (pp. 3929-3932).
4. Johnson, P. W., Kim, J. H., Zigman, M., Aulck, L., Hughes, M., Cavallari, J. M., Dennerlein, J. T. (2015). *A randomized controlled trial of new truck seats to investigate the reduction of whole body vibration exposures and low back pain.*. Santa Monica, CA: Proceedings of the Human Factors and Ergonomics Society's 58th Annual Meeting.
5. Kim, J. H., Zigman, M., Aulck, L., Hughes, M., Cavallari, J., Dennerlein, J. T., Johnson, P. W. (2015). *Whole body vibration exposures in long-haul truck drivers*. Santa Monica, CA: Proceedings of the Human Factors and Ergonomics Society's 58th Annual Meeting.

6. Kim, J. H., Zigman, M., Aulck, L., Ibbotson, J., Dennerlein, J. T., Johnson, P. W. (2015). *The effects of an Engineering intervention to reduce Whole Body Vibration on Self-reported Low Back Pain: A Randomized Controlled Trial Study*. Seoul,: Proceedings of the 33rd International Congress on Occupational Health.

Conferences Abstracts and Presentations

International

1. Cesario, C., Shayman, C. (Author), Abdullah, A. (Author), Fitzpatrick, D. F., Corkery, M., World Congress of Physical Therapy, "Are physical therapist students adequately prepared for primary contact practice?," Singapore. (May 4, 2015).
2. Dennerlein, J. T., Working on Safety, Safety management and culture, Porto, Portugal. (September 24, 2015).
3. Fitzpatrick, D. F. (Author & Presenter), Iversen, M. (Author), Bassin, J. P. (Author), World Conference of Physical Therapy, "Development and Implementation of a Global Academic Exchange to Promote Cultural Awareness Among Physical Therapy Students: A Longitudinal Examination.," WCPT, Singapore. (May 3, 2015).
4. Fitzpatrick, D. F. (Author & Presenter), Thomas, A. (Author), Patel, N. (Author), World Congress of Physical Therapy, "Interprofessional South African Global Experience: Impact on Facilitation and Assessment of Core Value Development and Cultural Competence, 3 year study," WCPT, Singapore. (May 2, 2015).
5. Flores AM, Nelson J, Stephenson RG, Robinson K, Blot WJ. Lymphedema signs, symptoms, self-reported diagnosis and referral to physical therapy among African American and low-incomebreast cancer survivors (abstract # 1 704). European Cancer Congress, Vienna, Austria. Sept. 2015
6. Huysmans, M. (Author & Presenter), Johnson, P. W. (Author), Dennerlein, J. T. (Author), van der Beek, A. (Author), 19th Triennial Congress of the International Ergonomics Association, Melbourne, "Predicted physical exposures during computer use were related to neck-shoulder symptoms in a large cohort of office workers," IEA, Melbourne, Australia. (September 9, 2015).
7. Iversen, MD. Adverse Effects of Exercise in Rheumatic and Musculoskeletal Diseases. EULAR, Rome, Italy, June 12, 2015.
8. Iversen, MD. Arthritis Management: Principles of Chronic Disease Care, Team Approaches and Secondary Prevention. APTA NEXT, Baltimore, MD, June 3, 2015.
9. Iversen, MD. Development and Implementation of a Global Academic Exchange to Promote Cultural Awareness Among Physical Therapy Students: A Longitudinal Examination. WCPT, Singapore, Japan, May 2, 2015.
10. Iversen, MD. Doing it Differently? New Approaches to Student Education and Improving Health Outcomes. EULAR, Rome, Italy, June 11, 2015
11. Johnson, P. W. (Author & Presenter), Barrero, L. H. (Author), Marin, L. S. (Author), Dennerlein, J. T. (Author), 19th Triennial Congress of the International Ergonomics Association, Melbourne, "Assessment of Continuous and Impulsive Whole Body Vibration Exposures in Heavy Equipment Mining Vehicle," IEA, Melbourne, Australia. (August 9, 2015).

12. Levac, D. E., 23rd Cochrane Colloquium, "Scoping reviews versus systematic reviews: Results from a scoping review of scoping reviews.," Cochrane, Vienna, Austria. (October 3, 2015).
13. Levac, D. E., International Conference on Paediatric Acquired Brain Injury, "Use of motor learning strategies in occupational and physical therapy for pediatric acquired brain injury," Liverpool, UK. (September 18, 2015).
14. Levac, D.E. Advancing the Field of Scoping Study Methodology. "Enhancing scoping study methodology: Building on the Arksey & O'Malley Framework. " Toronto, CA. (June 6, 2015).
15. Macri, E., Stefanik, J. J., Kahn, K., Crossley, K., International Patellofemoral Pain Research Retreat, "Is patellofemoral and tibiofemoral alignment and trochlear morphology associated with patellofemoral osteoarthritis? A systematic review," Manchester, United Kingdom. (September 4, 2015).
16. Stefanik, J. J., Felson, D., Duncan, R., Peat, G., Osteoarthritis Research Society International, "The Diagnostic Performance of Clinical Examination Measures, Location of Pain and Pain with Activities in Identifying Knees with Radiographic Patellofemoral Joint Osteoarthritis." (May 2, 2015).

National

1. Bliner Rosenberg, Y. (Author & Presenter), Golub-Victor, A. (Author & Presenter), Combined Sections Meeting, "Current evidence for school based physical therapists' screening and examination of children with a history of otitis media with effusion: A literature review," American Physical Therapy Association, Indianapolis, IN. (February 2015).
2. Cesario, C, Benfey K, DiRado, I, Gillbert, I, Megan, E, RISE, "ACL Prevention Program in High School Female Athletes". Boston, MA. (April 9, 2015)
3. Cesario, C., Bangs, D. J., Education & Leadership Conference, "Clinician Feedback Regarding Length of Physical Therapist Clinical Education Experiences," APTA, Baltimore, MD. (October 3, 2015).
4. Cesario, C., Shayman, C., Abdullah, A., Fitzpatrick, D. F., Corkery, M., World Congress of Physical Therapy, "Are physical therapist students adequately prepared for primary contact practice?," Singapore. (May 4, 2015).
5. Corkery, M. (Author & Presenter), Rigby, J. (Author), Singer, K. (Author), O' Rourke, B. (Author), Samantha, V. (Author), Sheng-Che, Y. (Author), Adam, T. (Author), APTA Combined Sections Meeting, "Motor control, joint mobility and low back pain in athletes: are they related?," Sports Section, Indianapolis, IN. (February 2015).
6. Corkery, M. B. (Author & Presenter), O' Rourke, B. (Author), Viola, S. (Author), Joseph, R. (Author), Kevin, S. (Author), Sheng-Che, Y. (Author), Adam, T. (Author), APTA Combined Sections Meeting, "An exploratory examination of the association between altered lumbar motor control, joint mobility and low back pain in athletes.," Sports Section, Indianapolis, IN. (February 2015).
7. Corkery, M., O' Rourke, B., Viola, S., Yen, S.-C., Rigby, J., Singer, K., Thomas, A. C. (2015). *An Exploratory Examination of the Association between Altered Lumbar Motor Control, Joint Mobility, and Low Back Pain in Athletes.* (1st ed., vol. 45, pp. A46–A73.). Alexandria, VA: J Orthop Sports Phys Ther..
8. Day, L. (Author & Presenter), Human Anatomy & Physiology Society, "I want to flip my class! Now what?," San Antonio, TX. (May 25, 2015). *Report Generated on December 23, 2015 Page 3 of 4*

9. Dennerlein, J. T. (Author & Presenter), National Perspectives on Ergonomics, Workplace Design, and Health: Lela Morris Symposium, "Improving Safety Culture through Workplace Programs," Center for Occupational and Environmental Health, University of California, Berkeley, Berkeley, CA. (May 22, 2015).
10. Dennerlein, J. T. (Author & Presenter), Sparer, E. H. (Author), Semiahmoo 2015 Annual Conference: Environmental, Occupational and Population Health: Thinking Outside the Boxes., "Improving construction site safety climate through a safety recognition and communication (incentive) program: Results from a cluster RCT," University of Washington, University of British Columbia, Blaine, WA. (January 8, 2015).
11. Dennerlein, J. T., Ergo-X, "Demystifying ergonomics for the modern office," Human Factors and Ergonomics Society, Anaheim, CA. (June 18, 2015).
12. Eden M*, Flores AM, Galantino ML, Spinelli B*. EDGE Task Force recommendations for head and neck cancer survivors. February 2015. APTA Combined Sections Meeting, Indianapolis, IN.
13. Esposito M, Rogazzo M, Salanitro B, Santilli R, Yen SC, **Corkery MB.** An Examination of the Association Between Neuromuscular Control of the Core During Functional Movements and Knee Pathologies in Athletes. Northeastern University Research and Scholarship Exposition. Boston, MA. April, 2015.
14. Flores AM, Nelson J. Physical and functional impairments and physical therapy utilization by poor and minority breast cancer survivors. February 2015. APTA Combined Sections Meeting, Indianapolis, IN.
15. Grant, M. P. (Author & Presenter), Dennerlein, J. T. (Author), National Occupational Injury Research Symposium., "Associations between walkthrough observations and worker self-reported work environment ergonomic factors in patient care units.," National Institute for Occupational Safety and Health, Kingwood, WV. (May 19, 2015).
16. Grant, M. P. (Author & Presenter), Dennerlein, J. T. (Author), National Occupational Injury Research Symposium., "Correlation between safety climate and worksite inspection data on commercial construction sites," National Institute for Occupational Safety and Health, Kingwood, WV. (May 19, 2015).
17. Grant, M. P. (Author & Presenter), Dennerlein, J. T. (Author), National Occupational Injury Research Symposium., "Preliminary results, challenges, and successes of implementing a comprehensive ergonomics and wellness Total Worker Health intervention on commercial construction sites," National Institute for Occupational Safety and Health, Kingwood, WV. (May 19, 2015).
18. Greenwood, K. C., American Physical Therapy Association Combined Sections Meeting, "How Are The Most Successful PT Programs Teaching Acute Care?," Indianapolis Indiana. (February 2015).
19. Greenwood, K. C., American Physical Therapy Association Combined Sections Meeting, "Success of an Early Mobility Program with a Patient s/p Mechanical ventilation with Severe Axonal Polyneuropathy in the Intensive care Unit: A Case Study," Indianapolis Indiana. (February 2015).
20. Greenwood, K. C., Kiami, S., American Physical Therapy Association Combined Sections Meeting, "Teaching Adult Neurologic Physical Therapy Management Through Interprofessional Simulation," Indianapolis Indiana. (February 2015).
21. Greenwood, K. C., Kiami, S., American Physical Therapy Association Combined Sections Meeting, "Teaching Adult Neurologic Physical Therapy Management Through Interprofessional Simulation," Indianapolis Indiana. (February 2015).
22. Greenwood, K. C., Kiami, S., Canali, A. A., Hickey, M. J., Iversen, M. D., American Physical Therapy Association Combined Sections Meeting, "Utilizing Simulation To promote Interprofessional Education Throughout a PT Curriculum," Indianapolis Indiana. (February 2015).

23. Hasson CJ and Yen S. (2015). Gait training through reinforcement. *Neural Control of Movement 25th Annual Conferenc*e, Charleston SC, April 20-24.
24. Hasson CJ, Gelina O, and Woo G. (2015). Adaptation to neural noise manipulation in voluntary movement control. *Society for Neuroscience 45th Annual Meeting*, Chicago IL, October
25. Hayward, L. M., Gardinier, L. M. (Author & Presenter), International Association for Research on Service-learning and Community Engagement (IARSLCE) Annual Meeting, "International Faculty-Led Programs: Benefits, Perceptions, and Challenges in Global Community Engagement.," International Association for Research on Service-learning and Community Engagement (IARSLCE), Chicago, Illinois (2011).
26. Hayward, L. M., Greenwood, K. C., Nippins, M. P., Canali, A. A., Combined Sections Meeting, "Student Perceptions and Understanding of Clinical Reasoning in the Inpatient Environment: A Qualitative Study," APTA, Indiana. (2015).
27. Kiami, S. (Author & Presenter), Augello, C. (Author & Presenter), Mangelinkx, L. (Author & Presenter), American Physical Therapy Association Combined Sections Meeting, "Usability and Perceived Efficacy of Neurological Digital Case Studies to Promote Critical Thinking Skills: A Pilot Study," APTA, Indianapolis, IN. (February 2015).
28. Levac, D. E., Glegg, S. American Academy of Cerebral Palsy & Developmental Medicine, "Toward best practices in virtual reality and active video game use within pediatric rehabilitation: Competencies, clinical decision-making and outcome measurement." Two hour instructional course. Austin, TX. (October 21, 2015).
29. Markowski, A. M., Greenwood, K. C., American Academy of Manual Therapy Annual Conference, "Curricular Implementation of Oral Health Screening Education and," AAOMPT, Louisville KY. (October 25, 2015).
30. Markowski, A. M., Greenwood, K. C., American Academy of Manual Therapy Annual Conference, "Curricular Implementation of Oral Health Screening Education and," AAOMPT, Louisville KY. (October 25, 2015).
31. Nippins, M. P., 2014 North American Cystic Fibrosis Conference, "Incorportating Physical Therapy into the CF Clinic," Cystic Fibrosis Foundation, Phoenix, AZ. (October 2015).
32. Nippins, M. P., 2015 North American Cystic Fibrosis Conference, "High Intensity Interval Training (HIIT) in Cystic Fibrosis," Cystic Fibrosis Foundation, Phoenix, AZ. (October 2015).
33. Nippins, M. P., 2015 North American Cystic Fibrosis Conference, "The Nuts and Bolts of Physical Therapy in Cystic Fibrosis," Cystic Fibrosis Foundation, Phoenix, AZ. (October 2015).
34. Nippins, M. P., Advanced Clinical Practice in Pediatrics Course, "The Pediatric Cardiopulmonary Review," American Physical Therapy Association, Memphis, TN. (September 2015).
35. Park S, Hasson CJ and Caldwell GE. (2015). Subject-specific adaptations in muscle synergies while learning to direct pedal forces. *Neural Control of Movement 25th Annual Conference*, Charleston SC, April 20-24.
36. Sharby, N. H., Roush, S. (Author & Presenter), Magassi, S. (Author), Moffat, M., Combined Sections Meeting, "Disability as Diversity," APTA, Indianapolis, IN. (February 7, 2015).
37. Sikes, R. W. (Author & Presenter), Markowski, A. M. (Author), Neuroscience 2015, "From slices to loaf: Teaching neuroanatomical spatial relations by assembling structures within student segmented brain slices into 3D printed models," Society for Neuroscience, Chicago, IL. (October 17, 2015).
38. Sikes, R. W. (Author), Morrison, T. R. (Author & Presenter), Melloni Jr, R. H. (Author), Neuroscience 2015, "Anabolic steroid exposure during adolescence alters the response

and the physiological parameters of neurons in the lateral anterior hypothalamus of the male hamster," Society for Neuroscience, Chicago, IL. (October 19, 2015).

39. Sparer, E. H. (Author & Presenter), Dennerlein, J. T. (Author), National Occupational Injury Research Symposium., "Improving safety communication and safety climate through a safety recognition and communication program: A mixed methods study," National Institute for Occupational Safety and Health, Kingwood, WV. (May 19, 2015).
40. Sparer, E. H. (Author & Presenter), Dennerlein, J. T., Work, Stress, and Health,2015, "Improving construction site safety communication and safety climate through a safety recognition and communication program," National Institute for Occupational Safety and Health and the American Psychological Associations, Atlanta, GA. (May 6, 2015).
41. Sparer, E. H. (Author & Presenter), Manjourides, J. (Author), Dennerlein, J. T. (Author), Work, Stress, and Health,2015, "Designing health interventions for construction workers: implications of length-biased sampling," National Institute for Occupational Safety and Health and the American Psychological Associations, Atlanta, GA. (May 6, 2015).
42. Stefanik, J. J., Felson, D., Niu, J., Hu, A., Apovian, C., LaValley, M., Neogi, T., American College of Rheumatology, "The Relation of Massive Weight Loss to Changes in Knee Pain and Sensitization," San Francisco, CA. (November 11, 2015)
43. Tunik, E. (Author), Yarossi, M. (Presenter), Wei, Y. (Other), Adamovich, S. (Other), Meeting of the Society for Neuroscience, "Comparison of TMS elicited and voluntary synergies of the human hand," Society for Neuroscience, Chicago, IL. (October 17, 2015).
44. Tunik, E., "Frontoparietal networks for grasping," University of Florida, Gainesville. (March 26,2015)
45. Tunik, E., Manuweera, T. (Presenter), Saleh, S. (Other), Yarossi, M. (Other), Adamovich, S. (Other), Meeting for the Society of Neuroscience, "Effects Of Goal-Directed Mirror Visual Feedback On Cortical Excitability In The Untrained Hemisphere," Society of Neuroscience, Chicago, IL. (October 17, 2015).
46. Watkins, M., Markowski, A. M., Gauthier,, P., Pempkowsk, L., International Association for Dance Medicine & Science 25th Annual Meeting, "The Use of the Functional Movement Screen for Recreational Dancers: A Systematic Review," Pittsburgh, PA. (October 10, 2015).
47. Yen, S.-C., Corkery, M., Donohoe, A., Grogan, M., Wu, Y.-N., Neuroscience 2015, "Feedback and feedforward control during walking in individuals with chronic ankle instability," Society of Neuroscience, Chicago, IL. (October 20, 2015).
48. Zhang Z, Hasson CJ, Abe MO, and Sternad D. (2015). Error amplification improves performance by reducing motor noise. *Neural Control of Movement 25th Annual Conference*, Charleston SC, April 20-24.

Local/Regional

1. Cesario, C, Benfey K, DiRado, I, Gillbert, I, Megan, E, RISE, “ACL Prevention Program in High School Female Athletes”. Boston, MA. (April 9, 2015)
2. Day, L. (Author & Presenter), Conference for Advancing Evidence-Based Teaching, "Flipped Classroom Effectiveness and Retention of Material," Northeastern University, Boston, MA. (May 5, 2015).
3. Day, L. (Author & Presenter), Experimental Biology, "Long-term Retention and Effectiveness in a Large-sized Flipped Gross Anatomy Course for Doctoral of Physical Therapy Students," American Association of Anatomist, Boston, MA. (March 28, 2015).
4. Folmar, E. J., Current Concepts in the Surgical and Rehab Management of the Young Athlete, "Rehab of the Throwing Athlete," Northeastern University, Northeastern University. (October 2015).

5. Folmar, E. J., Selected Taping techniques for the Lower Extremity, "Selected Taping techniques for the Lower Extremity," Summit Professional Education, various. (January – March 2015).
6. Folmar, E. J., Selected Taping Techniques for the Shoulder, "Selected Taping Techniques for the Shoulder," APTA MA Shoulder Special Interest Group, Boston MA. (June 2015).
7. Folmar, E. J., Selected Taping techniques for the Upper Extremity, "Selected Taping techniques for the Upper Extremity," Summit Professional Education, various. (January – March 2015).
8. Hasson CJ. “Careful control of dynamics objects”. New England Manipulation Symposium, Boston MA, May 23, 2015
9. Hayward, L. M., International Service Learning Conference, "Sustaining an International Service Learning Partnership: Inclusion of both the Community Perspective.," International Association for Research on Service Learning and Community Engagement, Boston. (2015).
10. Naidoo, K. (Author), Cesario, C., Fitzgerald, C. (Author), Annual Conference, "Beyond a social network: An information network for the health care professional: Moving from information recipient to information broker," APTA of Massachusetts, Norwood, MA. (November 14, 2015).
11. Nolan, D. C. (Presenter), 2015 Boston Marathon Medical Education Program, "Management of Musculoskeletal Injuries," Boston Athletic Association, Framingham, MA. (March 15, 2015).
12. Nolan, D. C. (Presenter), APTA Sports Physical Therapy Section Emergency Medical Responder Course, "Lessons Learned from the 2013 Boston Marathon Medical Coverage," APTA Sports Section, Boston, MA. (March 14, 2015).
13. Nolan, D. C. (Presenter), Asnis, P. (Presenter), McInnis, K. C. (Presenter), Primary Care Orthopaedics, "Orthopaedic Knee Pathology: Case Presentations and Discussion," Massachusetts General Hospital Department of Orthopaedic Surgery, Boston, MA. (May 4, 2015).
14. Nolan, D. C. (Presenter), Management of the Foot and Ankle Complex, "Management of the Foot and Ankle Complex," Spaulding Rehabilitation Hospital, Charlestown, MA. (November 21, 2015).
15. Nolan, D. C. (Presenter), McInnis, K. C. (Coordinator/Organizer), Davis, I. S. (Presenter), American Academy of Physical Medicine and Rehabilitation Annual Assembly, "Female Athlete Hip Injuries: Exploring the CORE of Patterns and Prevention," American Academy of Physical Medicine and Rehabilitation, Boston, MA. (October 1, 2015).
16. Nolan, D. C. (Presenter), McInnis, K. C. (Presenter), American Physical Therapy Association of Massachusetts Annual Conference, "Managing Hip, Pelvis and Lower Kinetic Chain Injury in the Endurance Athlete," American Physical Therapy Association of Massachusetts, Norwood, MA. (November 14, 2015).
17. Nolan, D. C. (Presenter), Primary Care Orthopaedics, "Management of Common Non-Operative Shoulder Conditions," Massachusetts General Hospital Department of Orthopaedic Surgery, Boston, MA. (May 4, 2015).
18. Nolan, D. C. (Presenter), Provencher, M. (Presenter), Primary Care Orthopaedics, "Orthopaedic Examination of the Shoulder Complex," Massachusetts General Hospital Department of Orthopaedic Surgery, Boston, MA. (May 4, 2015).
19. Nolan, D. C. (Presenter), Running Biomechanics, "Running Biomechanics," South Shore Hospital, Hingham, MA. (October 16, 2015).
20. Nolan, D. C. (Presenter), The ACL: Where Have We Been and Where are We Now? A Comprehensive Approach to the Care of the ACL Injured Patient, "Return to Sport

Considerations Following ACL Reconstruction," MGH / Northeastern University, Boston, MA. (June 13, 2015).

21. Nolan, D. C. (Presenter), Vopat, B. (Presenter), Massachusetts General Hospital Department of Orthopaedic Surgery, Sports Medicine Service Interdisciplinary Case Conference, "Osteochondral Lesions of the Talus," Massachusetts General Hospital Department of Orthopaedic Surgery, Boston, MA. (April 9, 2015).
22. Nolan, D. C. (Presenter), Weisbach, C. (Presenter), APTA of Massachusetts Manual Therapy SIG, "Manual Therapy Considerations for Shoulder Instability," APTA of Massachusetts, Newton, MA. (May 20, 2015).
23. Sikes, R. W. (Author & Presenter), Markowski, A. M. (Author & Presenter), Fraley, C., McAdow, K., Soo, K., Smith, R., Overmyer, K., American Association of Anatomists, "From the Slices to the Loaf: Using 3-D Design and Printing Software to Enhance Learning and Interpretation of 3-D Structures Within MRI Slices and the Clinical Application to Diagnostic Imaging," Boston MA. (March 2015).
24. Watkins, M., Markowski, A. M., De Monts de Savasse, C., Barnum, J., Moriarty, K., Hopkins, L., Santos, M., Annual Fall APTA MA Conferernce, "Are Health and Wellness Needs Being addressed for College Students?," APTA, Norwood MA. (November 14, 2015).
25. Yen, S.-C., Fajardian A, MTTC finalist presentation, “Virtually-interfaced Ankle and Balance Trainer (vi-RABT),” Massachusetts Technology Transfer Center, Boston, MA. (December 15, 2015).

At Northeastern:

1. Berkey, B. (Presenter), Roe, L. (Presenter), Begley, G. S. (Presenter), Golub-Victor, A. (Panelist), Center for Advancing Evidence-Based Teaching, First annual Conference, "Undergraduates as Innovation Partners in Teaching and Learning; Lessons from the Service-Learning Teaching Assistant Program," Northeastern University, Boston, MA. (May 2015).
2. Boyce, B. (Author & Presenter), Brown, J. (Author & Presenter), laMarca, A. (Author & Presenter), Oates, J. (Author & Presenter), Wong, H. (Author & Presenter), Golub-Victor, A. (Author), Research, Innovation and Scholarship Expo, "Implementation of a Health Education Curriculum for Middle School Students," Northeastern University, Boston, MA. (April 2015).
3. Chasey, T. (Author & Presenter), Keller, A. (Author & Presenter), O'Reilly, B. (Author & Presenter), Pratt, A. (Author & Presenter), Golub-Victor, A. (Author), Research, Innovation and Scholarship Expo, "An International Comparison of the Care and Education of Children with Special Needs in the United States and Switzerland," Northeastern University, Boston, MA. (April 2015).
4. Colton, J. (Author & Presenter), Choi, S. (Author & Presenter), Fitzpatrick, D. (Author), Golub-Victor, A. (Author), Research, Innovation and Scholarship Expo, "Cultural Influences and exercise parameters for community-dwelling aging adults," Northeastern University, Boston, MA. (April 2015
5. Day, L. (Presenter), Technology in Teaching (TEXPO), "Student Response Showdown: Learning Catalytics," Northeastern University, Boston, MA. (March 17, 2015).
6. Esposito M, Rogazzo M, Salanitro B, Santilli R, Yen SC, **Corkery MB.** An Examination of the Association Between Neuromuscular Control of the Core During Functional Movements and Knee Pathologies in Athletes. Northeastern University Research and Scholarship Exposition. Boston, MA. April, 2015.

7. Greenwood, K. C., Kiami, S., Canali, A. A., Hickey, M. J., Iversen, M. D., Conference for Advancing Evidence-Based Teaching, "Using Simualtion to Promote Student's Interprofessional Competency Development," Northeastern University. (May 2, 2015).
8. Greenwood, K. C., McNabb, J. W., TEXPO, "Use of GoAnimate Video Technology: Learning Object creation Tools," Northeastern University, Northeastern University. (March 17, 2015).
9. Greenwood, K. C., Nippins, M. P., Iversen, M. D., Conference for Advancing Evidence-Based Teaching, "Measuring Communication Competency in Heath Professions," NortheasternUniversity, Northeastern University. (May 2, 2015).
10. Hayward, L. M., Conference for Advancing Evidenced Based Teaching, "Classroom Factors that Contribute to DPT Student Motivation for Learning, Applying and Valuing Evidenced Based Practice," CATLR NU, Boston. (2015).
11. Hayward, L. M., NU RISE, "Que Necessasitas Tias?," Northeastern University, Boston. (2015).
12. Kiami, S., Beguerie, J. (Author & Presenter), Wong, N. (Author & Presenter), NU RISE 2015, "Examination of self-reported barriers to participating in fall prevention programs among community dwelling elders," Northeastern University. (April 2015).
13. Kiami, S., von Heideken, J. (Author), Iversen, M. (Author), NU RISE 2015, "Can Google Glass help to improve neuromuscular clinical examination skills among physiotherapy students? A randomized prospective study.," Northeastern University. (April 2015).
14. Markowski, A. M. (Author & Presenter), Sikes, R. W. (Author & Presenter), Fraley, C., McAdow, K., Soo, K., Smith, R., Overmyer, K., Conference for Advancing Evidence Based Teaching, "From the Slices to the Loaf: Using the latest 3-D Technology for developing a tool to enhance understanding and interpretation of 3-D Structures in 2D MRI Slices," Center forAdvanced Teaching and Learning through Research Northeastern University, Boston MA. (May 5, 2015).
15. Nolan, D. C. (Presenter), "Clinical Running Biomechanics: Getting the Injured Runner Back on the Road," Bay State Physical Therapy / Northeastern University, Boston, MA. (April 11, 2015).
16. Nolan, D. C. (Presenter), Asnis, P. (Presenter), The ACL: Where Have We Been and Where are We Now? A Comprehensive Approach to the Care of the ACL Injured Patient, "Anterior Cruciate Ligament Rehabilitation: How Fast Can We Go?," MGH / Northeastern University, Boston, MA. (June 13, 2015).
17. Nolan, D. C. (Presenter), Weisbach, C. (Presenter), Management of the Lumbar Spine, "Management of the Lumbar Spine," Bay State Physical Therapy / Northeastern University, Boston, MA. (June 28, 2015).
18. Nolan, D. C. (Presenter), Weisbach, C. (Presenter), Management of the Cervicothoracic Spine, "Management of the Cervicothoracic Spine," Bay State Physical Therapy / Northeastern University, Boston, MA. (June 27, 2015).
19. Sikes, R. W. (Author), Fraley, C. (Author & Presenter), Markowski, A. M. (Author), RISE 2015, "New teaching model incorporating 3d rendering and printing to supplement healthcare students' understanding of anatomy," Northeastern University RISE, Boston, MA. (April 2015).
20. Tunik, E., Boston Action Club, "New insights into human M1 function: Mapping hand representation and visuomotor adaptation," Northeastern University, Boston. (November 28, 2015).

On-Line / Webinars

1. Day, L. (Leader), "A Look at the New Smartbook," McGraw-Hill Education, online. (September 25, 2015).

2. Day, L. (Leader), "A Look at the New Smartbook," McGraw-Hill Education, online. (September 9, 2015).
3. Day, L. (Leader), "Motivating Students to Stay in the A&P Game," McGraw-Hill Education, online. (October 28, 2015).
4. Day, L. (Leader), "Motivating Students to Stay in the A&P Game," McGraw-Hill Education, online. (October 23, 2015).
5. Day, L. (Leader), "Motivating Students to Stay in the A&P Game," McGraw-Hill Education, online. (October 16, 2015).

REPORTS

1. Greenwood KC, Stewart E, Milton E., Hake M, Mitchell L, Sanders B. (2015). Core Competencies of Entry-Level Practice in Acute Care Physical Therapy. http://c.ymcdn.com/sites/www.acutept.org/resource/resmgr/Core_Competencies_of_Entry-L.pdf
2. Yarossi, M., Manuweera, T., Adamovich, S., Tunik, E. (2015). *Effects of goal-directed mirror visual feedback on cortical excitability in the untrained hemisphere*. Chicago, IL: Society for Neuroscience Abstract
3. Yarossi, M., Wei, Y., Adamovich, S., Tunik, E. (2015). *Comparison of TMS elicited and voluntary synergies of the human hand*. Chicago, IL: Society for Neuroscience Abstracts.

Grants Submitted in 2015 ($6.92 million requested)

Agency	Title	Direct Costs	Faculty	Status
NIH	Moving On: A pilot project of early intervention targeting impairments and self-efficacy for pre-operative breast cancer survivors	$286,566	Flores (PI)	JIT Requested
American Federation for Aging	Virtual Aging of Muscle Dynamics and Motor Function	$93,322	Hasson (PI)	Pending
NSF	SCH: EXP: Enhancing Motor Learning with a CAT (Computer-Aided Therapist)	$490,394	Hasson-Yen (Co-PIs)?	Pending
NIH	Virtual Aging of Muscle Dynamics and Motor Function	$1,858,246	Hasson (PI)	Pending
NIH	A Reinforcement Learning Approach to Gait Rehabilitation	$99,712	Hasson/Yen (Co-PI)	Pending
NIH	Predictability in Complex Object Control	$385,788	Hasson	Yes
Rheumatology Research Foundation	Identifying cases of PFJ OA & their hip impairments	$231,482	Stefanik	Yes
NIH	Planning a trial of novel footwear for knee osteoarthritis	$65,778	Stefanik	??
NIH	Planning and Updating in Frontoparietal Networks for Grasping	$799,364	Tunik	Yes
Mass Technology Transfer	The Virtually-interfaced Robotic Ankle and Balance Trainer (vi-RABT)	$36,308	Yen	Yes
NIH	Improving recurrent ankle sprains through error driven gait rehabilitation	$275,000	Yen	Pending
NIH	Robotic Leg Advancement Device	$104,860	Yen	Pending
CP International Research	Motor skill learning in virtual versus physical environments for children with cerebral palsy	$96,694	Levac	Pending
CP International Research	Development and evaluation of motivating virtual environments for motor skill learning in children and youth with cerebral palsy	$119,663	Levac	Pending
NEU	Does narrative feedback enhance motor learning of a virtual balance task in children with cerebral palsy?	$50,000	Levac	Yes
Foundation for PT	An Error Augmentation Approach to Intervene Chronic Ankle Instability	$80,000	Yen	Pending
NSF	SCH: EXP: Enhancing Motor Learning with a CAT (Computer-Aided Therapist)	$490,394	Yen	Pending
NIOSH	Center for Work Health and Wellbeing: Intervention Effectiveness	$1,296,420	Dennerlein	Pending
NIOSH	Center for Work Health and Wellbeing: Planning Core	$57,144	Dennerlein	Pending

Funded Grants Active in 2015 direct costs $1,441,223

Agency	Title	2015 Direct	Faculty
NIH	Planning and Updating in Frontoparietal Networks for Grasping	$269,697	Tunik
Foundation for Metro West	Enabling Children with Disabilities to Connect within the Wellesley Community through Sports	$10,000	Hayward
Doug Flutie J. Foundation	Enabling Young Athletes with Disabilities to Become Valued and Successful Members of the US Youth Soccer Family	$12,100	Hayward
Association of Ecuadorians in New England	A Place Called Home: Security for Abandoned Ecuadorian Children with Severe Disabilities	$14,085	Hayward
NEU	NU CATLR Honnors Faculty Scholars Program	$1,500	Hayward
NEU	CATLR Lead Faculty Scholars Program	$2,000	Hayward
Rheumatology Research Foundtion	Identifying cases of PFJ OA & their hip impairments	$125,000	Stefanik
NEU	Does Narrative Feedback Enhance Motor Learning of a Virtual Balance Task in Children with Cerebral Palsy?	$50,000	Leva
NIH	Predictability in Complex Object Control	$70,999	Hasson
Alpha Foundation	Whole body vibration exposure and injury prevention of heavy equipment operators in coal mines	$150,000	Dennerlein
NSF	Evaluate the Effect of Multitouch Interaction on the Musculoskeletal System	$25,000	Dennerlein
NIOSH/CPWR	Development and Evaluation of Contractor Safety Pre-Qualification Too	$162,794	Dennerlein
HSPH/NIOSH	Integrated Approaches to Health and Safety in Dynamic Construction Work Environment	$101,138	Dennerlein
NIOSH	Randomized Controlled Trial of Whole Body Vibration Intervention in Truck Drivers (R01 10097)	$377,514	Dennerlein
NIOSH/CPWR	Enhancing Safety Climate through Leadership	$53,496	Dennerlein
HSPH/NIOSH	HSPH Center for Work Health, and Wellbeing: Project A	$4,543	Dennerlein
HSPH/NIOSH	HSPH Center for Work Health, and Wellbeing: Admin Core	$11,357	Dennerlein