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ALAN R. NEEDLE

EDUCATION

UNIVERSITY OF DELAWARE AUGUST 2013
Doctor of Philosophy, Biomechanics & Movement Science
Concentration: Applied Anatomy & Biomechanics
Dissertation: Evaluation of neuromechanical decoupling following ankle joint injury
Advisor: C. Buz Swanik, PhD, ATC, FNATA

UNIVERSITY OF DELAWARE AUGUST 2009
Master of Science, Exercise Science
Concentration: Sports Medicine
Thesis: Microneurography evaluation of somatosensory afferent traffic in the unstable ankle
Advisor: C. Buz Swanik, PhD, ATC, FNATA

BOSTON UNIVERSITY MAY 2007
Bachelor of Science, Athletic Training

POSITIONS AND HONORS

Positions & Employment:

2019-Present Associate Professor, Appalachian State University, Boone, NC
2018-Present Research Affiliate, Blue Cross NC Institute for Health & Human Services
2013-2019 Assistant Professor, Appalachian State University, Boone, NC
2010-2013 Course Instructor, University of Delaware, Newark, DE
2011-2012 Athletic Trainer, Christiana Care Health System, Newark, DE
2009-2011 Graduate Assistant Athletic Trainer, University of Delaware, Newark, DE
2007-2010 Teaching Assistant, University of Delaware, Newark, DE
2007-2009 Graduate Assistant Athletic Trainer, Delaware State University, Dover, DE
2005-2007 Teaching Fellow, Sargent College, Boston University, Boston, MA

Honors:

2010 Eastern Athletic Trainers Association Masters Oral Presentation Winner
2010 NATA Free Communications Masters Oral Presentation Finalist
2013 ACSM Annual Meeting Best Basic Science Submissions
2013 NATA Free Communications Doctoral Oral Presentation Finalist
2014 ACSM Graduate Research Fellow
2014 NATA Free Communications Doctoral Poster Presentation Winner
2020 Board of Governors Appalachian State University School/College Teaching Award
2020 Appalachian State School of Graduate Studies Academy of Outstanding Graduate Mentors
2021 Beaver College of Health Sciences Research & Scholarly Endeavors Award

TEACHING EXPERIENCE

Associate Professor, Appalachian State University, Boone, NC	July 2019-Present
Assistant Professor, Appalachian State University, Boone, NC	August 2013-June 2019
<i>Department of Health & Exercise Science</i>	
AT 5300/5500: Examination, Diagnosis, and Treatment I/II (1 semester)	Fall 2020-
AT 5350: Physiology of Injury (1 semester)	Fall 2020-
E S 5720: Motor Behavior for Sport & Performance (3 semesters)	Spring 2018-
A T 3600 / A T 3615: Orthopedic Clinical Evaluation & Diagnosis I & II (7 semesters each)	Fall 2013-Spring 2020
A T 4030: Evidence-Based Practice in Athletic Training (8 semesters)	Fall 2013-Fall 2020
A T 4000: Athletic Training Clinical Lab VI (7 semesters)	Fall 2013-Fall 2019
A T 2700: Athletic Training Clinical Lab III (6 semesters)	Spring 2014-Spring 2019
A T 1600: Introduction to Athletic Training (3 semesters)	Spring 2014-Summer 2016

Instructor, University of Delaware, Newark, DE

Department of Health, Nutrition, and Exercise Science (2010-2011)

Department of Kinesiology & Applied Physiology (2011-2013)

HESC 305: Fundamentals of Athletic Training (2 semesters)	Spring 2011-2013
KAAP 305: Fundamentals of Sports Health Care (3 semesters)	
KAAP 488: Spine & Upper Extremity Evaluation Laboratory (3 semesters)	Fall 2010-Fall 2012
KAAP 489: Spine & Lower Extremity Evaluation Laboratory (3 semesters)	Spring 2011-Spring 2013

Teaching Fellow, Boston University, Boston, MA

Sargent College of Health and Rehabilitation Science

SAR HS 369: Gross Human Anatomy (4 semesters)	Fall 2005-Spring 2007
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HONORS AND AWARDS

Beaver College of Health Sciences Research & Scholarly Endeavors Award	August 2021
Board of Governors Appalachian State University School/College Teaching Award	April 2020
Appalachian State University Graduate Studies Academy of Outstanding Mentors	April 2020
NATA Free Communications Doctoral Poster Presentation Winner	June 2014
ACSM Graduate Research Fellow (JCMSS)	February 2014
NATA Free Communications Doctoral Oral Presentation Finalist	June 2013
ACSM Annual Meeting Best Basic Science Submissions	May 2013
University of Delaware Professional Development Award	June 2012
NATA Free Communications Masters' Oral Presentation Finalist	June 2010
EATA Free Communications Masters' Oral Presentation Winner	January 2010

RESEARCH GRANTS FUNDED

- National Athletic Trainers' Association Research & Education Foundation General Grant. July 2021
"How to TRAIN Pathways: Targeted Rehabilitation of Ankle Instability through Neurological Pathways."
Role: PI. \$57,349 Funded.
- Appalachian State University, Undergraduate Research Assistant Award.
Role: PI. \$1,000 Funded.
- Mid-Atlantic Athletic Trainers' Association District III Grant. December 2019
"The role of neuromuscular electrical stimulation on improving function in individuals with chronic ankle instability."
Role: PI. \$1,700 Funded.
- Cratis D. Williams Graduate School, Graduate Research Assistant Mentoring Award. November 2017
Role: PI. \$24,000 Funded.
- Appalachian State University, University Research Council Award. November 2017
"Stimulating the Cortex to Rehabilitate Injury-induced Plasticity."
Role: PI. \$4,000 Funded.
- Appalachian State University, Undergraduate Research Assistant Award. September 2016
Role: PI. \$1,000 Funded.
- National Athletic Trainers' Association Research & Education Foundation. July 2015
Role: Adviser. \$1,000 Funded.
- Cratis D. Williams Graduate School, Graduate Research Assistant Mentoring Award. April 2014
Role: PI. \$24,000 Funded.
- Appalachian State University, University Research Council Award. April 2014
"Influence of Ankle Injury on Joint Laxity, Corticospinal Excitability and Function."
Role: PI. \$5,000 Funded.
- Eastern Athletic Trainers' Association. January 2010
"Force sense and reactive stiffening in patients with unstable ankles and potential copers."
Role: PI. \$7,490 Funded.
- National Athletic Trainers' Association Research & Education Foundation. August 2008
Role: PI. \$1,000 Funded.

RESEARCH GRANTS PENDING OR NOT FUNDED

- National Institutes of Health (NIAMS). R21 mechanism. Submitted July 2020
"Treating Ankle Instability with a New SCRIPT: Stimulating the Cortex to Rehabilitate Injury-Induced Plasticity."
Role: PI. \$528,231 Not Funded.

National Athletic Trainers' Association Research & Education Foundation General Grant. "How to TRAIN Pathways: Targeted Rehabilitation of Ankle Instability through Neurological Pathways." Role: PI. \$57,411 Not Funded.	Submitted February 2020
National Institutes of Health (NIAMS). R21 mechanism. "Treating Ankle Instability with a New SCRIPT: Stimulating the Cortex to Rehabilitate Injury-Induced Plasticity." Role: PI. \$568,380 Not Funded.	Submitted November 2019
National Institutes of Health (NIAMS). R21 mechanism. "Treating Ankle Instability with a New SCRIPT: Stimulating the Cortex to Rehabilitate Injury-Induced Plasticity." Role: PI. \$549,382 Not funded.	Submitted March 2019
National Institutes of Health (NIAMS). R61 mechanism. "Treating Ankle Instability with a New SCRIPT: Stimulating the Cortex to Rehabilitate Injury-Induced Plasticity." Role: PI. \$870,020 Not funded.	Submitted July 2017
National Athletic Trainers' Association Research & Education Foundation "Clinical and Neurological Responses to Immobilization after Acute Ankle Sprain" Role: PI. \$49,853 Not funded.	Submitted February 2017
National Science Foundation. "Cognitive & Motor Connections: An interdisciplinary approach to understanding the brain's role in speech & postural control." Role: PI. \$294,877.33 Not funded.	Submitted August 2016
Appalachian State University Research Council Grant. "Impacts of Ankle Sprain on Disablement and Physical Activity in a Rural Adolescent Population." Role: PI. \$4,950 Not funded.	Submitted March 2016
American College of Sports Medicine Research Endowment "The effects of ankle immobilization devices on neuromechanical function in healthy adults." Role: PI. \$9,988 Not funded.	Submitted January 2016
American College of Sports Medicine Research Endowment "Neuromechanical Healing after Acute Ankle Sprain." Role: PI. \$9,900 Not funded.	Submitted January 2015

PUBLICATIONS

AT APPALACHIAN STATE UNIVERSITY

1. Turbyfill LR, Hatley LJ, Needle AR. The effects of concussions on batting performance in Major League Baseball players: A critically appraised topic. *J Sport Rehab*. 2021. In Press.

2. Farina KA, Needle AR, van Werkhoven H. Foot strike pattern during a maximal 800-m run. *Sensors*. 2021; 21(17):5782.
3. Needle AR, Rosen AB. Why re-think injury rehabilitation? *Athl Train Sport Health Care*. 2020; 12(6):243-244.
4. Sarvestan J, Needle AR, Ataabadi PA, Kovacicova Z, Svoboda Z, Abbasi A. Acute effect of ankle Kinesio™ taping on lower-limb biomechanics during single-legged drop landing. *J Sport Rehab*. 2020; 30(5):689-696.
5. Sarvestan J, Ataabadi PA, Svoboda Z, Kovacicova Z, Needle AR. Ankle-knee coupling responses to ankle Kinesio™ taping during single-leg drop landings in collegiate athletes with chronic ankle instability. *J Sports Med Phys Fit*. 2020. In Press.
6. Sarvestan J, Ataabadi PA, Svoboda Z, Kovacicova Z, Needle AR. The effect of ankle Kinesio™ taping on ankle joint biomechanics during unilateral balance status among collegiate athletes with chronic ankle sprain. *Phys Ther Sport*. 2020. 45:161-167.
7. Godwin JS, Hodgman CF, Needle AR, Zwetsloot KA, Shanely RA. Whole-body Heat Shock Accelerates Recovery from Impact-Induced Skeletal Muscle Damage in Mice. *Conditioning Med*. 2020. 3(4):184-191.
8. Watson EL, Doughton JH, Needle AR. Dynamic balance in healthy & chronically unstable ankles under varying cognitive loads. *Gait Post*. 2020; 79:10-15.
9. Needle AR, McAlister MK, Felpel ZJ, McBride JM. The use of an instrumented ankle arthrometer and external strain gauge to assess ankle dorsiflexion and plantarflexor stiffness. *J Am Podiatr Med Assoc*. 2020; 110(2):1-10.
10. Oates DC, Needle AR, Royer TD, Kaminski TW, Swanik CB. Reactive knee stiffening strategies between various conditioning histories. *Eur J Sports Sci*. 2020; 20(2):191-201.
11. Shanely RA, Zwetsloot JJ, Jurissen TJ, Hannan LC, Zwetsloot KA, Needle AR, Bishop AE, Guoyao W, Perkins-Veazie PP. Daily watermelon consumption for 6-weeks does not negatively impact insulin resistance or expression of systemic markers of atherosclerosis in free-living, overweight, postmenopausal women. *Nutrition Res*. 2020; 76:9-19.
12. Bruce AS, Howard JS, van Werkhoven H, McBride JM, Needle AR. The effects of transcranial direct current stimulation on chronic ankle instability. *Med Sci Sport Exerc*. 2020; 52(2):335-344.
13. Rice PE, Needle AR, Leicht Z, Zwetsloot KA, McBride JM. Muscle properties and stretch-shortening cycle function of young and elderly males. *J Musculoskelet Neuronal Interact*. 2019. 19(4):184-191.
14. Rosen AB, Needle AR, Ko J. Ability of Functional Performance Tests to Identify Individuals With Chronic Ankle Instability: A Systematic Review With Meta-Analysis. *Clin J Sport Med*. 2019; 29(6):509-522.
15. Kaminski TW, Needle AR, Delahunt EA. Prevention of Lateral Ankle Sprains. *J Athl Train*. 2019. 54(6):650-661.
16. Burcal CJ, Needle AR, Custer LC, Rosen AB. The effects of cognitive loading on motor behavior in injured individuals: a systematic review. *Sports Med*. 2019. 49(8): 1233-1253.
17. Holland BB, Needle AR, Batista RA, West ST, Christiana RW. The Relationship of Ankle Sprain, Chronic Ankle Instability, and Adolescents' Physical Activity Levels. *Plos One*. 2019. 14(4):e0216243.
18. Needle AR, Mackall JW. Convulsive Adverse Event in a Non-Predisposed Individual during Single Pulse Transcranial Magnetic Stimulation over the Lower Extremity Motor Cortex. *J of ECT*. 2019. 35(2):e13-e14.
19. Gurchiek RD, Don HSRA, Watagoda LCRP, McGinnis RS, van Wekhoven H, Needle AR, McBride JM, Arnholdt AT. Spring Assessment Using Machine Learning and a Wearable Accelerometer. *J Appl Biomech*. 2019. 35(2):164-169.
20. Gurchiek RD, McGinnis RS, Needle AR, McBride JM, van Werkhoven H. An adaptive filtering algorithm to estimate sprint velocity using a single inertial sensor. *Sports Eng*. 2018. 21(4):389-399.
21. Miller HN, Rice PE, Felpel ZJ, Bengtson EN, Needle AR. Influence of Visual Mirror Feedback and Ankle Joint Laxity on Dynamic Balance in Trained Ballet Dancers. *J Dance Sci Med*. 2018; 22(4): 184-191.

22. Needle AR, Baumeister J, Farquhar WB, Geaney JL, Higginson JS, Kaminski TW, Swanik CB. The relationship between the sensory responses to ankle-joint loading and corticomotor excitability. *Int J Neurosci*. 2018; 128(5):435-441.
23. Lidstone DE, van Werkhoven H, Needle AR, Rice PE, McBride JM. Gastrocnemius fascicle and achilles tendon length at the end of the eccentric phase in a single and multiple countermovement hop. *J Electromyogr Kinesiol*. 2018;38:175-181.
24. Stirling AM, McBride JM, Merritt EK, Needle AR. Nervous system excitability and joint stiffness following short-term dynamic ankle immobilization. *Gait Posture*. 2018;59(Supplement C):46-52.
25. Cagle JA, Overcash KB, Rowe DP, Needle AR. Trait Anxiety as a Risk Factor for Musculoskeletal Injury in Athletes: A Critically Appraised Topic. *Int J Athl Ther Train*. 2017;22(3):26-31.
26. Needle AR, Kaminski TW, Baumeister J, Higginson JS, Farquhar WB, Swanik CB. The relationship between joint stiffness and muscle activity in unstable ankles and copers. *J Sport Rehab*. 2017;26:15-25.
27. Gurchiek RD, McGinnis RS, Needle AR, McBride JM, van Werkhoven H. The use of a single inertial sensor to estimate 3-dimensional ground reaction force during accelerative running tasks. *J Biomech*. 2017;61:263-268.
28. Lidstone DE, Stewart JA, Gurchiek R, Needle AR, van Werkhoven H, McBride JM. Physiological and Biomechanical Responses to Prolonged Heavy Load Carriage During Level Treadmill Walking in Females. *J Appl Biomech*. 2017;33(4):248-255.
29. Needle AR, Lepley AS, Grooms DR. Central Nervous System Adaptation After Ligamentous Injury: a Summary of Theories, Evidence, and Clinical Interpretation. *Sports Med*. 2017;47(7):1271-1288.
30. Needle AR, Rosen AB. Ligament Injury Changes Brain Function: Now Let's Think About It. *Athl Train Sports Health Care*. 2017;9(5):198-199.
31. Griebert MC, Needle AR, McConnell J, Kaminski TW. Lower-leg Kinesio tape reduces rate of loading in participants with medial tibial stress syndrome. *Phys Ther Sport*. 2016;18:62-67.
32. Kim AS, Needle AR, Thomas SJ, Higginson CI, Kaminski TW, Swanik CB. A sex comparison of reactive knee stiffness regulation strategies under cognitive loads. *Clin Biomech (Bristol, Avon)*. 2016;35:86-92.
33. Palmer JA, Needle AR, Pohlig RT, Binder-Macleod SA. Atypical cortical drive during activation of the paretic and nonparetic tibialis anterior is related to gait deficits in chronic stroke. *Clin Neurophysiol*. 2016;127(1):716-723.
34. DeAngelis AI, Needle AR, Kaminski TW, Royer TR, Knight CA, Swanik CB. An acoustic startle alters knee joint stiffness and neuromuscular control. *Scand J Med Sci Sports*. 2015;25(4):509-516.
35. Goodman AG, Zwetsloot KA, Needle AR. Effects of Bacrobial(r) skin cleanser on the prevention of muscle cramps. *J Sports Sci USA*. 2015;3(5):219-222.
36. Fayson SD, Needle AR, Kaminski TW. The Effect of Ankle Kinesio Tape on Ankle Muscle Activity During a Drop Landing. *J Sport Rehabil*. 2014.
37. Needle AR, Baumeister J, Kaminski TW, Higginson JS, Farquhar WB, Swanik CB. Neuromechanical coupling in the regulation of muscle tone and joint stiffness. *Scand J Med Sci Sports*. 2014;24(5):737-748.
38. Needle AR, Swanik CB, Schubert M, et al. Decoupling of laxity and cortical activation in functionally unstable ankles during joint loading. *Eur J Appl Physiol*. 2014;114(10):2129-2138.
39. Fayson SD, Needle AR, Kaminski TW. The effects of ankle Kinesio taping on ankle stiffness and dynamic balance. *Res Sports Med*. 2013;21(3):204-216.

40. Needle AR, Palmer JA, Kesar TM, Binder-Macleod SA, Swanik CB. Brain regulation of muscle tone in healthy and functionally unstable ankles. *J Sport Rehabil*. 2013;22(3):202-211.
41. Needle AR, Swanik CB, Farquhar WB, Thomas SJ, Rose WC, Kaminski TW. Muscle spindle traffic in functionally unstable ankles during ligamentous stress. *J Athl Train*. 2013;48(2):192-202.
42. Shields CA, Needle AR, Rose WC, Swanik CB, Kaminski TW. Effect of elastic taping on postural control deficits in subjects with healthy ankles, copers, and individuals with functional ankle instability. *Foot Ankle Int*. 2013;34(10):1427-1435.
43. Miller HE, Needle AR, Swanik CB, Gustavsen G, Kaminski TW. The effect of external prophylactic support on ankle laxity in healthy, unstable, and previously sprained ankles following functional activity. *Foot Ankle Int*. 2012;33(10):862-869.
44. Disanto TJ, Swanik CB, Swanik KA, Straub SJ, Needle AR. Concurrent validity of the anterior drawer test and an arthrometer in evaluating ankle laxity. *Athl Train Sport Health Care*. 2011;3(1):15-20.
45. Needle AR, Kaminski TW. Effectiveness of Low-Intensity Pulsed Ultrasound, Capacitively Coupled Electric Fields, or Extracorporeal Shock Wave Therapy in Accelerating Stress Fracture Healing. *Athl Train Sport Health Care*. 2009;1(3):133-139.

MANUSCRIPTS IN REVIEW/ PREPARATION

1. Kim KM, Needle AR, Kim JS, An YW, Cruz-Diaz D, Taube W. Disinhibitory Interventions for Chronic Ankle Instability: A systematic review with meta-analysis. *Sports Med*. In preparation.
2. Sarvestan J, Svoboda Z, Ataabadi PA, Kovacikova Z, Needle AR. Acute impacts of ankle Kinesio™ taping on jump biomechanics in collegiate athletes with chronic ankle sprain. *Sport Biomechanics*. Under review.
3. Mackall JW, van Werkhoven H, Merritt EK, Needle AR. The relationship between musculotendinous stiffness and neural inhibition following acute eccentric exercise. *Exp Brain Res*. In preparation.
4. Key JJ, Howard JS, Zwetsloot KA, Needle AR. Cortical activation and knee proprioception following exercise-induced muscle damage. *Scand J Med Sci Sport*. In preparation.
5. Needle AR, Cash J, Ripic ZA, Bruce AB, Emery LJ, Triplett NT, van Werkhoven H. The effects of mental fatigue on kinematics during an unanticipated jump landing. *Scand J Med Sci Sport*. In preparation.
6. Needle AR. Should we consider non-invasive brain stimulation as an intervention for musculoskeletal injury? *Br J Sports Med*. In preparation.
7. Kim KM, Needle AR, An YW, Arwari B, Taube W. Cortical activation during static balance in individuals with acute ankle sprain. *J Clin Med*. In preparation.
8. Needle AR, Tinsley JE, Cash JJ, Koeval BK, Barton JA, Howard JS. The effects of electrical stimulation to the ankle pronators on neural excitability & functional status in patients with chronic ankle instability. *Int J Sport Phys Ther*. In preparation.
9. Cash JJ, van Werkhoven H, Cole KJ, Needle AR. The effects of 72 hours of dynamic ankle immobilization on neural excitability and lower extremity kinematics. *Gait Posture*. In preparation.

PEER-REVIEWED ABSTRACTS

AT APPALACHIAN STATE UNIVERSITY

1. Sarvestan J, Kovacikova Z, Svoboda Z, Needle AR. Ankle Kinesio taping impacts on lower limbs biomechanics during countermovement jump among collegiate athletes with chronic ankle instability. *Gait Posture*. 2020: 81:327-328.
2. Needle AR, Mackall JM, Merritt EK, van Werkhoven H. Muscle soreness from eccentric exercise does not modify neural excitability. *J Athl Train*. 2019; 54(6S):S-415.

3. Bruce AS, Howard JS, van Werkhoven H, McBride JM, Needle AR. Eccentric training with anodal transcranial direct current stimulation increases muscle activation in individuals with chronic ankle instability. *J Athl Train*. 2019; 54(6S):S-186.
4. Godwin JS, Klatt B, Brownlee H, Needle AR, Zwetsloot K, Shanely RA. Whole-body heat shock accelerates recovery from a single blunt trauma contusion in mice. *Med Sci Sport Exerc*. 2019; 51(5):S62-63.
5. Rice PE, Zwetsloot KA, Needle AR, Bruce AS, Guthrie CD, Gillen LA, Nimphius S. Force-velocity profiles of dancers and endurance runners during ankle-specific stretch-shortening cycle tasks. *ISBS Proceedings Arch*. 2018; 36(1):285.
6. McBride JM, Rice PE, Needle AR, Leicht ZS, Zwetsloot KA. Lower leg morphology and stretch-shortening cycle performance in young and elderly males. *ISBS Proceedings Arch*. 2018; 36(1):823.
7. Needle AR, Watson EL, Bearden AC, Doughton JH. The effects of multiple modalities of cognitive demand on dynamic balance in patients with chronic ankle instability. *J Athl Train*. 2018; 53(6S):S-119.
8. Needle AR, Sledge RA, Doughton JH, Zrull MC. Muscle-specific cortical adaptations to balance training with electromyographic biofeedback in able-bodied individuals. *Med Sci Sports Exerc*. 2018; 50(5S):568-569.
9. Needle AR, Holland BB, Battista RA, West ST, Christiana RW. Physical activity among rural high school students with a previous history of ankle sprain. *Br J Sports Med*. 2017; 51(S1): A26-A27.
10. Holland BB, Needle AR, Battista RA, Christiana RW. Prevalence of ankle sprain and instability among rural high school students. *Br J Sports Med*. 2017; 51(S1): A1
11. Needle AR, McAlister MK, Felpel ZJ, McBride JM. Correlations between arthrometer-measured plantarflexor stiffness, ligamentous laxity, and range-of-motion at the ankle. *J Athl Train*. 2017; 52(6S): 287.
12. Miller HN, Felpel ZJ, Stirling AS, Bengtson EN, Needle AR. The effects of visual feedback and ankle laxity on dynamic balance in trained ballet dancers. *J Athl Train*. 2017; 52(6S): 101.
13. McAlister MK, Felpel ZJ, Stirling AS, Needle AR. Reliability of an ankle arthrometer with external strain gauge for quantifying plantar flexor stiffness. *J Athl Train*. 2017; 52(6S): 283.
14. Stirling AM, Felpel ZJ, Merritt EK, McBride JM, Needle AR. Short-term ankle immobilization does not alter nervous system excitability in uninjured individuals. *J Athl Train*. 2017; 52(6S):148.
15. Stirling AM, Felpel ZJ, Needle AR. The effects of immobilization and physical activity following acute ankle sprain on corticospinal excitability to the lower leg. *J Athl Train*; 2016; 51(6S):135.
16. Needle AR, Stirling AM, Felpel ZJ. Neurological changes following acute lateral ankle sprain: an 8-week pilot investigation. *Br J Sports Med*; 2015; 49(S1):A1.
17. Needle AR, Greaney JG, Farquhar WB, Swanik CB. Ankle injury alters the muscle spindle response to repeated instrumented joint mobilization. *J Athl Train*. 2015; 50(6):S130.
18. Oates DC, Needle AR, Kaminski TW, Royer TD, Swanik CB. Deactivation strategies for knee joint compliance differs among athletes with varying conditioning histories. *J Athl Train*. 2015; 50(6): S292.
19. Needle AR, Felpel ZJ, Stirling A. Single-limb stance increases cortical excitability to the lower-leg muscles in able-bodied adults. *Med Sci Sports Exerc*. 2015; 46(5):S533.
20. Needle AR, Swanik CB, Baumeister J, Higginson JS, Farquhar WB, Greaney JL, Kaminski TW. Ankle injury alters the relationship between joint laxity, peripheral sensation, and cortical activation. *J Athl Train*. 2014; 49(3):S167.

AT THE UNIVERSITY OF DELAWARE

21. Needle AR, Baumeister J, Schubert M, Reinecke K, Higginson JS, Swanik CB. Instrumented anterior mobilization of the ankle joint increases contralateral somatosensory cortex activation in healthy subjects. *J Athl Train*. 2013; 48(3):S16.
22. Swanik CB, Needle AR. Ankle copers demonstrate altered muscle activation strategies for maintaining joint stiffness. *J Athl Train*. 2013; 48(3):S213
23. Deangelis AI, Needle AR, Royer T, Knight CA, Kaminski TW, Swanik CB. Knee stiffness regulation after the startle response and hormonal changes. *J Athl Train*. 2013; 48(3):S174.

24. An YW, Oates DC, Needle AR, Kaminski TW, Swanik CB. Force sense does not differ between power and endurance trained collegiate athletes. *J Athl Train*. 2013; 48(3):S172.
25. Oates DC, Needle AR, Kaminski TW, Swanik CB. Knee joint stiffness differs among athletes with varying conditioning histories. *J Athl Train*. 2013; 48(3):S171-172.
26. Fayson SD, Needle AR, Kaminski TW. The effects of ankle Kinesio taping on muscle activity during a drop landing maneuver. *J Athl Train*. 2013; 48(3):S145.
*Winner of 2013 NATA Foundation Undergraduate Poster Award
27. Caccese JB, Griebert MC, Needle AR, Kaminski TW. Kinesio tape for the lower leg shifts lateral plantar forces during gait. *J Athl Train*. 2013; 48(3):S90-91.
28. Shields CA, Needle AR, Swanik CB, Rose WC, Kaminski TW. The effects of Kinesio taping on postural control deficits in healthy ankles, copers, and individuals with functional ankle instability. *J Athl Train*. 2013; 48(3):S88.
29. Needle AR, Kaminski TW, Swanik CB. Unstable ankles and copers do not differ in their ability to deactivate during a perturbation.” *Med Sci Sport Exerc*. 2013; 45(5):S590-591.
30. Needle AR, Kesar TM, Palmer JA, Binder-MacLeod SA, Swanik CB. Cortical inhibition is related to ankle laxity. *J Orthop Sports Phys Ther*. 2013; 43(3): A15.
31. Griebert MC, Needle AR, Kaminski TW. Lower-leg Kinesio® tape application reduces rate of loading in subjects with medial tibial stress syndrome. *J Orthop Sports Phys Ther*. 2013; 43(3): A21.
32. Palmer JA, Needle AR, Binder-MacLeod SA. Effect of a novel motor learning task on hemispheric laterality in able bodied individuals. *Society for Neuroscience 2012*.
33. Needle AR, Swanik CB. Reactive joint stiffness is impaired in functionally unstable ankles. *J Athl Train*. 2012; 47: S154-155.
34. Swanik CB, Needle AR. Ankle copers exhibited a heightened sense of force. *J Athl Train*. 2012; 47: S154.
35. Griebert MC, Needle AR, Kaminski TW. Lower leg Kinesio® tape application reduces rate of loading in healthy subjects. *J Athl Train*. 2012; 47: S140-141.
36. Needle AR, Swanik CB. Kinesthetic awareness is related to ankle inversion stiffness. *Med Sci Sports Exerc*. 2012; 44(5): S87.
37. Needle AR, Swanik CB, Farquhar WB, Kaminski TW, Rose WC. Resting muscle spindle activity correlates with ankle stiffness. *J Athl Train*. 2011; 46(3): S183-4.
38. Swanik CB, Needle AR. Ankle copers demonstrate increased anterior stiffness compared to healthy and unstable ankles. *J Athl Train*. 2011; 46(3): S14.
39. Miller HE, Needle AR, Swanik CB, Gustavsen G, Kaminski TW. The effect of external prophylactic support on ankle laxity in healthy, unstable, and previously sprained ankles following functional activity. *J Athl Train*. 2011; 46(3):S111.
40. Fayson SD, Needle AR, Kaminski TW. The effects of ankle Kinesio taping on ankle stiffness and dynamic balance. *J Athl Train*. 2011; 46(3):S114.
41. O’Neill M, Needle AR, Swanik CB, Jaric S, Glutting JJ, Kaminski TW. The effects of fatigue and gender on reach scores in high school athletes. *J Athl Train*. 2011; 46(3): S72.
42. Needle AR, Swanik CB, Farquhar WB, Thomas SJ, Kaminski TW. Microneurographic evaluation of afferent deficits in the unstable ankle during anterior loading and inversion stress. *J Athl Train*. 2010; 45(3): S46.
43. Needle AR, Farquhar WB, Kaminski TW, Thomas SJ, Rose WC, Swanik CB. A novel technique for simultaneously measuring somatosensory traffic, joint loading and motion at the ankle. *Med Sci Sport Exerc*. 2010; 42(5): S9.

INVITED PRESENTATIONS

AT APPALACHIAN STATE UNIVERSITY

1. *Can we rewire the sprained brain?* Presented as a Tutorial Lecture at the 2020 Southeast American College of Sports Medicine Meeting in Jacksonville, Florida on February 14, 2020.

2. *Can we rewire the sprained brain? Addressing neurophysiologic deficits in CAI rehabilitation.* Presented as a Symposium at the 2019 International Ankle Symposium in Amsterdam, Netherlands on October 3, 2019.
3. Session chair. *The CAI Rehabilitation Spectrum: A multifaceted approach to improving patient outcomes.* Presented as a Symposium at the 2019 International Ankle Symposium in Amsterdam, Netherlands on October 3, 2019.
4. *Treating Joint Instability with a New SCRIPT: Stimulating the Cortex to Rehabilitate Injury-induced Plasticity.* Presented to the Seminar for Health, Activity, Rehabilitation & Exercise (SHARE) at Appalachian State University, Boone, NC on September 27, 2019.
5. *Neuromechanical Consequences of Musculoskeletal Injury.* Presented to the Research Showcase with the Provost at Appalachian State University, Boone, NC on September 6, 2019.
6. *Brain-Hacking: Can or Should We Correct the Cortical Adaptations That Happen After Injury?* Presented as a Special Topic at the 2019 National Athletic Trainers' Association Annual Meeting in Las Vegas, NV on June 26, 2019.
7. *Neuromechanical Consequences of Musculoskeletal Injury.* Presented to the Applied Neuromechanics Research, Motor Behavior, Balance Analysis & Training, and Virtual Environment for Assessment & Rehabilitation Laboratories at the University of North Carolina at Greensboro on April 8, 2019.
8. *Should I Make My Athletes Think? The Inclusion of Dual-Tasking in Rehabilitation.* Presented as a Special Topic at the 2018 National Athletic Trainers' Association Annual Meeting in New Orleans, LA on June 28, 2018.
9. *Remembering the Brain in Orthopedic Rehabilitation.* Presented with Adam Lepley & Dustin Grooms as a Panel Presentation at the 51st Winter Conference on Brain Research in Whistler, BC on January 15, 2018.
10. *Neuroplasticity after Musculoskeletal Injury.* Presented with Adam Lepley & Dustin Grooms as Feature Presentation at National Athletic Trainers Association Annual Meeting in Baltimore, MD on June 22, 2016.
11. *New Frontiers in Musculoskeletal Research: Neurophysiological Testing in Sports Medicine.* Presented with Adam Lepley & Dustin Grooms as Tutorial Lecture at American College of Sports Medicine Annual Meeting in Boston, MA on June 1, 2016.
12. *Improving Sensory Function after Ankle Sprain.* Presented with Matthew C. Hoch as an Evidence-Based Forum at the National Athletic Trainers' Association Annual Meeting in St. Louis, MO on June 24, 2015.
13. *Can We Predict Injury at the Ankle?* Presented to the North Carolina Athletic Trainers' Association Annual Symposium in Concord, NC on March 21, 2015.
14. *Assessment of the Thoracic Spine.* Presented to the North Carolina Athletic Trainers' Association Annual Symposium in Wrightsville Beach, NC on March 8, 2014.
15. *Neuromechanical Changes following Joint Injury: From the ligament to the brain.* Presented to the Joint Commission on Sports Medicine & Science in Orlando, FL on February 14, 2014.

AS DOCTORAL STUDENT AT THE UNIVERSITY OF DELAWARE

16. *Neuromechanical Changes Following Joint Injury: From the ligament to the brain.* Presented to the Joint Commission for Medicine and Science in Sport on February 13, 2014.
17. *Force sense & reactive stiffening in patients with unstable ankles and copers.* EATA Grant Lecture. Presented to the Eastern Athletic Trainers' Association Meeting and Clinical Symposium in Boston, MA on January 8, 2012.
18. *Instability of the Ankle.* Guest Lecture presented to Dr. C. Buz Swanik's HESC604: Sensorimotor Characteristics of Injury class on March 12, 2012.
19. *Kinesiotaping for the Lower Leg: An Evidence-based Approach.* Presented to Medical Aspects of Sport Conference at the University of Delaware on February 4, 2012.
20. *Force Sense & Reactive Stiffening in Patients with Unstable Ankles & Potential Copers.* Presented to 2012 Eastern Athletic Trainers' Association Annual Meeting on January 8, 2012.
21. *Instability of the Ankle.* Guest Lecture presented to Dr. C. Buz Swanik's HESC604: Sensorimotor Characteristics of Injury class on May 4, 2010.
22. *Rib-Tip Syndrome: Current Evaluation and Management Techniques.* Presented to Medical Aspects of Sport Conference at the University of Delaware on February 7, 2010.

SCIENTIFIC (PEER-REVIEWED) PRESENTATIONS

AS ASSOCIATE PROFESSOR AT APPALACHIAN STATE UNIVERSITY

1. *Neither sensory nor motor threshold transcutaneous neuromuscular electrical stimulation alters proprioception after exercise-induced muscle damage.* Virtual poster presentation – Virtual National Athletic Trainers' Association Clinical Symposium, July 13, 2020.
2. *Four weeks of eccentric training with anodal transcranial direct current stimulation decreases disablement in patients with chronic ankle instability: a preliminary investigation.* Oral presentation – International Ankle Symposium, Amsterdam, Netherlands; October 3, 2019.
3. *Muscle soreness from eccentric exercise does not modify neural excitability.* Poster presentations – National Athletic Trainers' Association Clinical Symposium, Las Vegas, NV; June 25, 2019.
4. *The effects of multiple modalities of cognitive demand on dynamic balance in patients with chronic ankle instability.* Oral presentation – National Athletic Trainers' Association Clinical Symposium, New Orleans, LA, June 28, 2018.
5. Moderator, “*Central Nervous System in Lower Extermity Function*”. Free Communications Oral presentation – National Athletic Trainers' Association Clinical Symposium, New Orleans, LA; Jun 29, 2018.
6. *Muscle-specific cortical adaptations to balance training with electromyographic biofeedback in able-bodied individuals.* Poster presentation – American College of Sports Medicine Annual Meeting, Minneapolis, MN: June 1, 2018.
7. *Physical activity among rural high school students with a previous history of ankle sprain.* Poster presentation – International Ankle Symposium, Chapel Hill, NC: September 16, 2017.
8. *Correlations between arthrometer-measured plantarflexor stiffness, ligamentous laxity, and range-of-motion at the ankle.* Poster presentation – National Athletic Trainers Association Clinical Symposium, Houston, TX: June 29, 2017.
9. *Reliability of an Ankle Arthrometer with External Strain Gauge for Quantifying Plantar Flexor Stiffness.* Poster presentation – National Athletic Trainers Association Clinical Symposium, Houston, TX: June 29, 2017.
10. *Neurological Changes following Acute Lateral Ankle Sprain: An 8-week pilot investigation.* Oral presentation – 6th International Ankle Symposium, Dublin, Ireland: October 16, 2015.
11. *Ankle Injury Alters the Muscle Spindle Response to Repeated Instrumented Joint Mobilization.* Oral presentation – National Athletic Trainers Association Clinical Symposium, St. Louis, MO: June 26, 2015
12. *Single-Limb Stance Alters Cortical Excitability to the Lower-Leg Musculature in Able-Bodied Adults.* Poster presentation – American College of Sports Medicine Annual Meeting, San Diego, CA: May 28, 2015.
13. *Influences of ankle injury on joint laxity, corticospinal excitability, and function.* Poster presentation – National Athletic Trainers Association Clinical Symposium, Indianapolis, IN; June 27, 2014.

**NATA Foundation Doctoral Poster Award Winner*

AS DOCTORAL STUDENT AT THE UNIVERSITY OF DELAWARE

14. *Instrumented anterior mobilization of the ankle joint increases contralateral somatosensory cortex activation in healthy subjects.* Oral presentation – National Athletic Trainers Association Clinical Symposium, Las Vegas, NV; June 25, 2013.
- *NATA Foundation Doctoral Oral Award Finalist*
15. *Unstable ankles and copers do not differ in their ability to deactivate during a perturbation.* Thematic Poster Session – American College of Sports Medicine Annual Meeting, Indianapolis, IN; June 1, 2013.
 16. *Unstable ankles and copers do not differ in their ability to deactivate during a perturbation.* Poster presentation, Best Basic Science Poster Session – American College of Sports Medicine Annual Meeting, Indianapolis, IN; May 30, 2013.
 17. *Ligamentous loading of the ankle increases contralateral somatosensory cortex activity in healthy subjects.* Poster presentation – Delaware Health Science Alliance Meeting, Newark, DE; May 10, 2013.

18. *Ligamentous loading of the ankle increases contralateral somatosensory cortex activity in healthy subjects*. Poster presentation – Delaware Society for Neuroscience Meeting, Newark, DE; November 30, 2012.
19. *Cortical inhibition is related to ankle laxity*. Oral presentation – 5th International Symposium, Lexington, KY; October 18, 2012.
20. *Reactive joint stiffness is impaired in functionally unstable ankles*. Poster presentation – National Athletic Trainers Association Clinical Symposium, St. Louis, MO; June 27, 2012.
21. *Kinesthetic awareness is related to ankle inversion stiffness*. Thematic Poster Session – American College of Sports Medicine Annual Meeting, San Francisco, CA; May 30, 2012.
22. *Cortical inhibition is related to ankle laxity*. Oral presentation – University of Delaware Biomechanics Research Symposium, Newark, DE; April 23, 2012.
23. *Corticospinal excitability of peroneus longus is correlated with ankle laxity*. Poster presentation – Delaware Society for Neuroscience Meeting, Newark, DE; December 1, 2011.
24. Moderator, “*Ankle Injury and Postural Control*”. Free Communications Oral presentations – National Athletic Trainers’ Association Clinical Symposium, New Orleans, LA; June 22, 2011.
25. *The effect of external prophylactic support on ankle laxity in healthy, unstable, and previously sprained ankles*. Free Communication Thematic Poster presentation – National Athletic Trainers’ Association Clinical Symposium, New Orleans, LA; June 23, 2011.
26. *Resting muscle spindle activity correlates with ankle stiffness*. Poster presentation – National Athletic Trainers’ Association Clinical Symposium, New Orleans, LA; June 21, 2011.
27. *Ankle copers demonstrate increased anterior stiffness compared to healthy and unstable ankles*. Oral presentation – University of Delaware Biomechanics Research Symposium, Newark, DE; May 13, 2011.
28. Moderator, *Session 1*, University of Delaware Biomechanics Research Symposium, Newark, DE; May 13, 2011.
29. *Microneurographic evaluation of afferent deficits in the unstable ankle during anterior loading and inversion stress*. Oral presentation – National Athletic Trainers’ Association Clinical Symposium; Philadelphia, PA; June 23, 2010.
*2010 NATA Foundation Masters Oral Award Finalist
30. *A novel technique for simultaneously measuring somatosensory traffic, joint loading and motion at the ankle*. Oral presentation – American College of Sports Medicine Annual Conference; Baltimore, MD; June 2, 2010.
31. *Resting muscle spindle activity correlates with ankle stiffness*. Poster presentation – University of Delaware Biomechanics Research Symposium; Newark, DE; May 7, 2010.
32. *Microneurographic evaluation of afferent deficits in the unstable ankle during anterior loading and inversion stress*. Oral presentation – Eastern Athletic Trainers’ Association Annual Meeting; Boston, MA; January 10, 2010.
33. *The effectiveness of low-intensity pulsed ultrasound, capacitively coupled electric fields, and extracorporeal shock wave therapy in healing stress fractures: A systematic review*. Oral presentation – International Symposium on Sports Medicine; Tel Aviv, Israel; July 9, 2009.

INVITED GRANT REVIEWS

1. University of Nebraska Omaha Office of Research and Creative Activities Grant Program. April 2015.
2. Research Foundation Flanders (FWO) Postdoctoral Fellowship Program, August 2017.
3. Appalachian State University Graduate Research Assistant Mentor Program, January 2019.
4. Israeli Ministry of Science and Technology. Medical Devices Proposal. April 2020.

CLINICAL EXPERIENCE

Head Athletic Trainer

Pan-American Maccabi Games, Santiago, Chile

December 2016-January 2017

Head Athletic Trainer <i>19th World Maccabiah Games, Netanya, Israel</i>	July 2013
Athletic Trainer <i>USA Hockey, Atlantic Region</i>	April 2012-August 2012
Athletic Trainer <i>Pan American Maccabi Games, Sao Paolo, Brazil</i>	December 2011-January 2012
Athletic Trainer <i>Christiana Care Health System, Wilmington, DE</i>	August 2011-June 2012
Graduate Assistant Athletic Trainer <i>University of Delaware, Newark, DE</i>	August 2009-June 2011
Athletic Trainer <i>18th World Maccabiah Games, Tel Aviv, Israel</i>	July 2009
Graduate Assistant Athletic Trainer <i>Delaware State University, Dover, DE</i>	August 2007-July 2009

PROFESSIONAL MEMBERSHIPS & CERTIFICATIONS

National Provider Identifier: 1235527748	
Certified Athletic Trainer (050702166) <i>Board of Certification, Inc.</i>	2007-Present
State Licensed Athletic Trainer (2428) <i>State of North Carolina</i>	2013-Present
State Licensed Athletic Trainer (J3-0000296) <i>State of Delaware</i>	2007-2014
Certified Strength & Conditioning Specialist <i>National Strength & Conditioning Association</i>	2008-Present
CPR for the Professional Rescuer <i>American Red Cross</i>	1999-Present
Member, National Athletic Trainers' Association (994843)	2006-Present
Member, American College of Sports Medicine	2009-Present
Member, National Strength & Conditioning Association	2008-2014

REGIONAL & NATIONAL SERVICE

Editorial Board Member <i>Journal of Sport Rehabilitation</i>	2019-Present
Guest Editor <i>Athletic Training & Sports Health Care Special Issue:</i>	2019-Present

“Changing the way we THINK about Rehabilitation”

Member, Institutional Review Board 2017-Present
Rocky Mountain University of Health Professions

Chair, Undergraduate Student Symposium Committee 2015-2016 (chair)
North Carolina Athletic Trainers’ Association 2013-2015 (member)

Associate Editor 2015-Present
Athletic Training & Sports Health Care

Guest Editor, “Kinesio Taping: Evidence-Based Science or Fashion?” 2013-2014
Evidence-Based Complimentary & Alternative Medicine

Manuscript Reviewer:

Archives of Physical Medicine & Rehabilitation, Athletic Training & Sports Health Care, British Journal of Sports Medicine, Gait & Posture, International Journal of Athletic Therapy & Training, Journal of Applied Biomechanics, Journal of Athletic Training, Journal of Dance Medicine & Science, Journal of Manipulative and Physiological Therapeutics, Journal of Musculoskeletal & Neuronal Interactions, Journal of Sport Rehabilitation, Journal of Strength & Conditioning Research, Medicine, Medicine & Science in Sport & Exercise, Nature Scientific Reports, Physical Therapy in Sport, Physician and Sportsmedicine, PLOS-ONE, Sports Health, Sports Medicine

UNIVERSITY SERVICE

Member, Return to Human Subjects Research Task Force June 2020-Present
Appalachian State University, Boone, NC

Member, Promotion & Tenure Committee August 2019-Present
Chair, Promotion & Tenure Committee August 2020-Present
Department of Health & Exercise Science
Appalachian State University, Boone, NC

Member, Chancellor's and Provost's Excellence in Research, Scholarship, and Creative Activity Award Committee September 2019-October 2019
Appalachian State University, Boone, NC

Member, Departmental Personnel Committee August 2019-Present
Department of Health & Exercise Science
Appalachian State University, Boone, NC

Member, Athletic Training Faculty Search Committee July 2018-December 2018
Appalachian State University, Boone, NC

Member, Associate Director of Research Protections Search Committee June 2018-December 2018
Appalachian State University, Boone, NC

Member, Exercise Science Master’s Degree Steering Committee January 2018-Present

Appalachian State University, Boone, NC

Member, Beaver College of Health Science Transition Team September 2017-September 2018
Appalachian State University, Boone, NC

Member, Athletic Training Master's Degree Curriculum Committee December 2016-Present
Appalachian State University, Boone, NC

Member, Director of Office of Research & Data Analysis Search Committee
Appalachian State University, Boone, NC November 2017-March 2018

Member, Exercise Science Search Committee November 2016-March 2017
Appalachian State University, Boone, NC

Member, Peer Associated Review Enterprise June 2016-Present
Appalachian State University, Boone, NC

Member, Institutional Review Board January 2016-Present
Appalachian State University, Boone, NC

Member, Athletic Training Position Search Committee October 2015-February 2016
Appalachian State University, Boone, NC

Chair, Health & Exercise Science Reappointment, Tenure, Promotion, & Merit Committee
Appalachian State University, Boone, NC August 2015-August 2018

Member, BCBSNC Inst. For Health & Human Services Advisory Board August 2014-August 2018
Appalachian State University, Boone, NC

Member, Office of Student Research Advisory Committee August 2014-July 2017
Appalachian State University, Boone, NC

Member, Departmental Personnel Committee August 2014-May 2017
Department of Health & Exercise Science
Appalachian State University, Boone, NC

Member, Interprofessional Education Committee August 2014-May 2016
Beaver College of Health Sciences
Appalachian State University, Boone, NC

Member, Depart. of Health & Exercise Science Transition Team October 2013-March 2014
Appalachian State University, Boone, NC

Member, Biomechanics Position Search Committee November 2013-March 2014
Appalachian State University, Boone, NC

Member, Athletic Training Education Steering Committee September 2009-July 2013
University of Delaware, Newark, DE

President, Sargent College, Class of 2007 September 2005-May 2007

Boston University, Boston, MA

Treasurer, Sargent College, Class of 2007
Boston University, Boston, MA

September 2004-May 2005

Member, Boston University Society of Athletic Training Students
Boston University, Boston, MA

September 2003-May 2007

GRADUATE AND UNDERGRADUATE ADVISEES

As Graduate Faculty at Appalachian State University, Boone, NC

Jacob Barton (In Progress), "The effect of peripheral somatosensory stimulation on ankle function in individuals with chronic ankle instability." Master's thesis committee chair.

Blake Koeval (In Progress), "The effects of anodal transcranial direct current stimulation over the dorsolateral prefrontal cortex in individuals with chronic ankle instability." Master's thesis committee chair.

Jasmine Cash (2020), "The effects of three-days of ankle immobilization on joint motion & neural excitability." Master's thesis committee chair.

*2020 Winner of Appalachian State University Domer Research Award

David Schumacher (2020), "The effects of movement complexity on relationships between foot anthropometry and jump performance." Master's thesis committee member.

Amelia Bruce (2019), "The effects of anodal transcranial direct current stimulation on neural excitability and function in individuals with chronic ankle instability." Master's thesis committee chair.

*2020 Winner of Appalachian State University Outstanding Thesis Award

Jared Key (2019), "The effects of transcutaneous electrical nerve stimulation on proprioception and cortical activation following exercise-induced muscle damage." Master's thesis committee chair.

Josh Godwin (2019), "Heat shock protein activation attenuates damage caused by blunt trauma contusions." Master's thesis committee member.

Zachary Ripic (2019), "Lower limb musculoskeletal and neural factors that influence functional mobility and postural control in the elderly." Master's thesis committee member.

Wilton Norris (2018), "A biomechanical analysis of experienced and novice runners at varying speeds." Master's thesis committee member.

Katie Farina (2018), "Relationship between changes in foot strike pattern and indexes of fatigue in a maximal 800-meter run." Master's thesis committee member.

John Mackall (2018), "The effects of exercise-induced muscle damage on ankle stiffness and cortical excitability." Master's thesis committee chair.

Aaron McMichael (2017), "Quantifying the shape of the maximal expiratory flow-volume curve following acute electronic cigarette use." Master's thesis committee member.

Rachel Sledge (2017), "Utilizing biofeedback to enhance cortical contributions to postural control." Undergraduate thesis committee chair.

Reed Gurchiek (2017), "The use of inertial measurement units to perform kinetic analyses of accelerative running tasks." Master's thesis committee member.

Brittany Holland (2017), "The relationship between ankle sprain and chronic ankle instability and adolescents' physical activity levels." Master's thesis committee member.

Alyssa Stirling (2016), "The effects of ankle immobilization devices on corticomotor excitability in able-bodied individuals." Master's thesis committee chair.

Daniel Lidstone (2015), "Relationship between Achilles tendon stiffness and *in vivo* behavior of the musculotendinous complex during maximal-height single joint jumping." Master's thesis committee member.

Meredith Buskard (2014), “Effects of Concussions and Repetitive Head Blows on Neurocognitive Function of Collegiate Wrestlers.” Master’s thesis committee member.

As Doctoral Supervisor at University of Delaware, Newark, DE

- David Craig Oates (2014), “Reactive knee stiffness regulation strategies between different conditioning histories.” Master’s thesis supervisor.
- Athena Deangelis (2013), “Interaction effects of the startle response and hormonal changes on knee stiffness.” Master’s thesis supervisor.
- Shirleeah D. Fayson (2013), “The effect of ankle Kinesio tape on dynamic balance, stiffness, and muscle activity.” Undergraduate research project supervisor. Ms. Fayson was recognized as an undergraduate research finalist and winner, respectively, at the 2011 and 2013 NATA conferences.
- Jessica H. Bonnett (2013), “The effect of gluteus medius Kinesio tape on jump landing mechanics.” Undergraduate research project supervisor.
- Ashli Bottino (2013), “The effect of gluteus medius Kinesio tape on dynamic stability during landing.” Undergraduate research project supervisor.
- Christina A. Shields (2012), “The effects of Kinesio taping® on postural control deficits in healthy ankles, copers, and individuals with FAI.” Master’s thesis supervisor.
- Maggie C. Griebert (2012), “Lower-leg Kinesio tape application reduces rate of loading in subjects with medial tibial stress syndrome.” Undergraduate thesis committee member.
- Christopher Clyde (2012). “The effect of eccentric hamstring exercise on EMG output in female athletes during a functional landing task.” Master’s thesis supervisor.
- Nick Geller (2012), “Hamstring stiffness in male subjects with a history of unilateral hamstring strain.” Master’s thesis supervisor.
- Heather E. (Abbott) Miller (2010), “A novel way of measuring ankle stability after functional activity.” Master’s thesis supervisor.
- Megan O’Neill (2010), “The effect of fatigue & gender on the star excursion balance test in high school athletes.” Master’s thesis supervisor.

GRADUATE COURSEWORK

	<u>Class</u>	<u>Title</u>
<i>Fall 2007</i>	HESC 601	Research Methods
	HESC 666	Advanced Exercise Physiology
	HESC 603	Seminar in Exercise Science
<i>Spring 2008</i>	HESC 602	Elementary Computer Statistics
	HESC 604	Sensorimotor Characteristics of Injury
	HESC 804	Clinical Measures in Exercise Physiology
	HESC 603	Seminar in Exercise Science
<i>Fall 2008</i>	HESC 606	Evidence-Based Sports Medicine
	HESC 603	Seminar in Exercise Science
<i>Spring 2009</i>	HESC 605	Pathoetiology of Musculoskeletal Injuries
	HESC 666	Clinical Measures in Sports Medicine
	HESC 603	Seminar in Exercise Science
<i>Fall 2009</i>	HESC 651	Neurophysiological Basis of Human Movement
	HESC 667	Introduction to LabVIEW
	HESC 689	Introduction to Laboratory Instrumentation
	BMSC 865	BIOMS Seminar
<i>Spring 2010</i>	HESC 667	LabVIEW for Scientists
	HESC 688	Electromyographic Kinesiology
	PHYT 626	Advanced Regional Anatomy
	BMSC 865	BIOMS Seminar

<i>Fall 2010</i>	BMSC 868	Research
	BMSC 866	Advanced Techniques in Sensorimotor Research
	EDUC 690	Multivariate Data Analysis
	BMSC 865	BIOMS Seminar
<i>Spring 2011</i>	HESC 690	Biomechanical Methods
	BMSC 868	Research
	PHYT 623	Clinical Neuroscience
<i>Fall 2011</i>	KAAP808	Seminar in Motor Behavior
	BMSC869	Pre-dissertation Study
<i>Spring 2012</i>	BMSC969	Doctoral Dissertation