Karen L. Troy, Ph.D.

Professor
Department of Biomedical Engineering
Department of Mechanical Engineering
Worcester Polytechnic Institute
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EDUCATION

BS	Washington University in St. Louis	Biomedical Engineering	1999
BS	Washington University in St. Louis	Systems Science and Mathematics	1999
PhD	University of Iowa, IA	Biomedical Engineering	2003

Dissertation: *"The emu as a model for necrotic femoral head collapse"*
Advisor: Thomas D. Brown, PhD

HONORS/AWARDS

Dean's Honorary Scholarship	1995-1999
Army ROTC Scholarship	1995-1996
NSF Graduate Research Fellowship	1999-2002
American Society of Biomechanics Microstrain Award	2001
American Society of Biomechanics Clinical Biomechanics Award	2002
American Society of Biomechanics Young Scientist Postdoctoral Award	2006
Orthopaedic Research Society New Investigator Recognition Award (NIRA)	2010
Alice L. Jee Memorial Young Investigator Award (IBMS)	2010
American Society of Biomechanics Journal of Biomechanics Award Runner-up	2012
American Society of Biomechanics Clinical Biomechanics Award	2014
Biomedical Engineering Teacher of the Year (WPI)	2019
American Society of Biomechanics Journal of Biomechanics Award Runner-up	2019
Biomedical Engineering Outstanding Researcher of the Year (WPI)	2021
American Society of Biomechanics Founder's Award	2021

PROFESSIONAL SOCIETIES

Tau Beta Pi *(Engineering honor society)*	1998-present
American Society of Biomechanics	1999-present
Orthopaedic Research Society	2002-present
American Society for Bone and Mineral Research	2010-present

ACADEMIC EMPLOYMENT HISTORY

Professor, Depts. of Biomedical and Mechanical Engineering 7/2021-present
Worcester Polytechnic Institute

Visiting Professor, Laboratory for Bone Biomechanics, ETH Zörich, Switzerland 5-8/2021

Visiting Scientist, Spaulding National Running Center 7/2019-7/2020
Spaulding Rehabilitation Hospital, Harvard, Cambridge, MA

Associate Professor, Dept. of Biomedical Engineering 7/2016-6/2021

Worcester Polytechnic Institute

Assistant Professor, Dept. of Biomedical Engineering 8/2013-6/2016
Worcester Polytechnic Institute

Associate Professor (Collaborative appointment) Worcester Polytechnic Institute
Dept. of Mechanical Engineering 8/2013-present

Assistant Professor, Dept. of Bioengineering 1/2007-7/2013
University of Illinois at Chicago

Assistant Professor, Dept. of Kinesiology and Nutrition 1/2007-7/2013
University of Illinois at Chicago

Postdoctoral Research Fellow, Musculoskeletal Biomechanics Laboratory. 2003-2006
Director: Mark D. Grabiner, PhD University of Illinois at Chicago

CONSULTING

Reed Engineering Consultants Engineers and Scientists Hanover, NH
BioMedical Forensics Moraga, CA

TEACHING

Introduction to Biomedical Engineering (BME1001)	Worcester Polytechnic Institute
Skeletal Biomechanics Lab (BME3503)	Worcester Polytechnic Institute
Biomechanics (BME/ME4504)	Worcester Polytechnic Institute
Computational Biomechanics (BME595)	Worcester Polytechnic Institute
Scientific Communication (BME593)	Worcester Polytechnic Institute
Biomechanics of Orthopaedic Devices (BME553)	Worcester Polytechnic Institute
Grad. Seminar in Kinesiology and Nutrition	University of Illinois at Chicago
Biomechanics of Musculoskeletal Tissues	University of Illinois at Chicago
Evidence Based Practice	University of Illinois at Chicago

GRANTS AND FUNDING

09/2021-08/2024 *"Biomechanical factors affecting metatarsal fatigue and bone stress injury risk"* R15HD104169
Submitted to: National Institutes of Health
Role: Principal Investigator
Status: Funded

01/2020-12/2021 *"Evaluating the relative influence of bone and foot strength to metatarsal bone stress injuries in athletes"*
Submitted to: Foundation for PM&R
Role: Co-Investigator
Status: Funded

7/1/2020-6/31/2021 *"American Society of Biomechanics Annual Meeting"* R13 Scientific Meeting grant
Submitted to: National Institutes of Health
Role: Co-Investigator
Status: Funded

4/2015-9/2021: *"Effects of Ekso-assisted gait training on Bone Health and Quality of Life: A Randomized Clinical Trial"* W81XWH-15-2-0078
Submitted to: Department of Defense
Role: Co-Investigator (Institutional Principal Investigator)
Status: Funded

5/2017-4/2018 *"The Effect of Ergometer Setup and Rowing Technique on Joint Loading during FES-Rowing among People with Spinal Cord Injury"*
Submitted to: American Society of Biomechanics, Grant in Aid program
Role: Dissertation advisor (Submitted by PhD student Ying Fang)
Status: Complete

9/2016-9/2017 "*Noninvasive prediction of crack initiation and propagation in native and simulated drug-treated proximal femora"*
Submitted to: Merck, Inc. (Investigator Initiated)
Role: Co-Principal Investigator, with Nima Rahbar
Status: Complete

4/2016-6/2017 "*Advanced Imaging to Quantify Joint Deformity in Rheumatic Disease"*
Submitted to: WPI/UMass Collaborative Seed Grant
Role: Co-Principal Investigator (with Ellen Gravallese, MD)
Status: Complete

4/2016-3/2019 *"Actuation, Sensing, and Control of Posture in Dynamic Environments for Improved Vehicle Safety"*
Submitted to: Toyota Motor Engineering and Manufacturing in North America
Role: Co-investigator
Status: Complete

5/1/2016-9/30/2016 *"QCT analysis for the effects of FES-assisted rowing on bone structure"*
Subcontract on Department of Defense award to Leslie Morse
Role: Principal Investigator
Status: Complete

4/1/2016-3/31/2018 NRSA postdoctoral training grant for Joshua E. Johnson *"Smoking effects on bone microstructure, mechanical strength, and fracture healing"* F32-AR068839
Submitted to: National Institutes of Health
PI: Joshua E. Johnson
Role: Primary Mentor

Status: Complete

7/2014-9/2017 *"Skeletal and Clinical Effects of Exoskeleton Assisted Gait"*
Submitted to: Department of Defense W81XWH-14-1-0611
Role: Qualified Collaborator (Institutional Principal Investigator)
Status: Complete

8/2013-7/2018: *"Promoting Healing of Tendinopathies Using Therapeutic Mechanobiologic Stimulation for Targeted Removal of Aggrecan-Rich Deposits"* R01 AR063144
Submitted to: The National Institutes of Health
Role: Consultant
Status: Complete

9/2012-8/2018: *"A prospective study of human bone adaptation using a novel in-vivo loading model"* R01 AR063691
Submitted to: The National Institutes of Health
Role: Principal Investigator
Status: Complete

11/2010-10/2014: *"Effect of Teriparatide, Vibration and the Combination on Bone Mass and Bone Architecture in Chronic Spinal Cord Injury"* W81XWH-10-1-0951
Submitted to: Department of Defense
PI: Thomas J. Schnitzer
Role: Co-Investigator (Institutional Principal Investigator)
Status: Complete

9/2012-9/2013: *"Risk Assessment in Older Minority Survivors (RAISe)"*
Submitted to: Midwest Roybal Center for Health Promotion and Translation
PI: Patricia Sheean
Role: Collaborator
Status: Complete

9/2011-9/2013: NRSA Postdoctoral Training Grant for W. Brent Edwards *"Changes in proximal tibia fracture strength as a function of time elapsed since spinal cord injury"* F32 AR061964
Submitted to: The National Institutes of Health
PI: W. Brent Edwards
Role: Primary Mentor
Status: Complete

2011-2013: *"Assessment of Change in Bone Mass and Bone Architecture in Acute Spinal Cord Injury: Quantitative Computed Tomography (QCT) Analysis"*
Submitted to: Merck, Inc. (Investigator Initiated)
Role: Co-Principal Investigator, with Thomas J. Schnitzer
Status: Complete

2010-2012: *"A fundamental study of nanoscale material properties of dental composite-tooth interfaces"*
Submitted to: The Chancellor's Discovery Fund for Multidisciplinary Research (UIC)
Role: Co-Principal Investigator, with Carmen Lilly and Ana Bedran-Russo
Status: Complete

2007 – 2012: *"Rehabilitation Engineering Research Center on Recreational Technologies and Exercise Physiology Benefiting Persons with Disabilities"* H133E070029
Submitted to: The National Institute on Disability and Rehabilitation (NIDR)
PI: James Rimmer
Role: Project Principal Investigator
Status: Complete

12/2004 – 12/2006: NRSA Postdoctoral Training Grant *"Finite element modeling of Colles' Fractures"* F32 AG25619
Submitted to: The National Institutes of Health
Role: Principal Investigator
Status: Complete

9/1999 – 8/2002: National Science Foundation Graduate Research Fellowship
Status: Complete

MENTORED STUDENTS

PhD Students:

- Andrew Wilzman, *(PhD; 2020-present)*
- Kyle Murdock, *(PhD; 2019-present. Thesis topic: Effects of intrinsic foot muscle activation on metatarsal loading and bone stress injury during running)*
- Megan Mancuso, *(PhD; 2020. Thesis title: "Defining the Multiscale Relationship between Subject-Specific Bone Strain and Structural Adaptation in the Distal Radius of Women")*
- Ying Fang, PhD *(2018. Thesis title: "Investigation of bone loading in FES-assisted rowing and its effect on preventing bone loss in people with spinal cord injury")*
- Varun Bhatia, PhD *(2013. Thesis title: "Loading Induced Bone Adaptation in the Distal Radius of Women: Influence of Mechanical Environment")*
- Jessica Longworth, PhD *(2014. Thesis title: "Biomechanics of manual wheelchair propulsion: the effects of speed and exercise")*

Master's Students:

- Logan Gaudette, BS *(2021-present, project topic: effects of foot structure and muscle activation on metatarsal loading)*
- Talia Vaughn, BS *(2021-present, project topic: comparison of distal tibia bone microstructure in basketball players vs. runners – what is the effect of habitual loading?)*
- Nicole Mattson, MS (*2020-present. Thesis topic: Effects of exoskeleton-assisted walking on bone structure in individuals with spinal cord injury)*
- Tsolmanbaatar Khurelbaatar, MS *(2017-2019. Thesis title: "Mechanical strain environment and skeletal adaptation in first-time marathon trainees")*

Hannah Sattler, MS *(2016-2017. Project title: "Changes to bone microstructure in first-time marathoners")*
Travis Henchie, MS *(2015-2018. Thesis title: "An image-based method to measure joint deformity in inflammatory arthritis")*
KaLia Burnette, MEng *(2014-15)*
Henry Nguyen, MEng *(2014-15)*
John Foy, MEng *(2014-15)*
Varun Bhatia, MS *(2007-2009. Thesis title: "Short term bone adaptation due to mechanical loading in mouse tibiae")*

Postdoctoral Research Fellows

W. Brent Edwards, PhD (*2009-2013; Funded on individual NIH Fellowship 2011-13*)
Joshua E. Johnson, PhD (*2013-present; Funded on individual NIH Fellowship 2016-18*)
Tiffiny Butler, PhD *(2013-2015*)

Master's Thesis Committees:

Stephanie J. Donovan *(2006)*
Paul M. Fowler *(2006)*
You-hau Chang *(2008)*
Idubijes Rojas *(2009)*
Julie Cain *(2011)*
Timothy Pollard *(2012. Thesis title: "Dentin-composite interfaces: static and viscoelastic properties measured with nanoindentation")*
Jennifer Cooper *(2014. Thesis title: "A circumferential stretch bioreactor for mechanical conditioning of smooth muscle rings")*
Anna Novoseltseva *(2018. Thesis title: "Force feedback for the patient side manipulator of the daVinci research kit")*

PhD Thesis Committees:

Kyra Burnette *(May, 2019, Thesis title: "High throughput and high resolution functional imaging methods to identify mechanisms of variable neural excitability in C. elegans")*
Chris Nycz *(July, 2018, Thesis title: "Modeling and analysis of design parameters for portable hand orthoses to assist upper motor neuron syndrome impairments and prototype design")*
Henry Huang *(May, 2017, Thesis title: "Exploring New Therapeutic Strategies for Osteoarthritis: From Genetic Manipulation of Host Cells to Chemically-modified Synthetic Hydrogels")*
Valentina Ngai *(May, 2010. Thesis title: "Assessment of in vivo gait patterns on wear of total knee replacements")*
Troy Reynolds *(December, 2010. Thesis title: "Perspectives of fitness center accessibility between people with disabilities and fitness professionals")*
Kim Nolte *(December, 2010. Thesis title: "Evaluation of resistance training equipment using three dimensional musculoskeletal modeling focusing on the biomechanical and anthropometric considerations of the end-user")*
Chris Hurt *(December, 2011. Thesis title: "The influence of age on the maintenance of frontal plane dynamic stability")*
Jeremy Crenshaw *(December, 2011. Thesis title: "The influence of age on compensatory stepping thresholds")*

Rebecca Bell *(May, 2012. Thesis title: "The effects of mechanical loading and ADAMTS5 activity in a tendinopathy model")*

Graduate Directed Research / Lab Rotations / Independent Projects supervised:

Emily Robbins, Fall 2017 *(Dynamic strain mapping of the ulnar collateral ligament)*
Bryan Choate, *(2018-2019; MRI-based FE models to estimate proximal femur strain)*

Senior Design Projects and Honors Students:

Ryan Rivadello *(2007-2008; Honors Capstone Project)*
Christine Hofmann *(2008-2009; Honors Capstone Project. Awarded Honorable Mention, 2009 Student Research Forum)*
Adaeze Chuma-Okorafor and senior design project team members *(2007-2008; Senior Design Project/Capstone Project. Awarded Second Place, 2008 Student Research Forum)*
Lindsey Graff *(2009-2010; Honors Capstone Project. Awarded the 2009 Kabbes award for undergraduate research and 2010 Honors Council Award)*
Erika Macias *(2010-2012; Honors Capstone Project)*
Deepali Darji *(2011-2012)*
Kristen Frederici *(2012-2013; Honors Capstone Project)*
Pathik Patel, Harish Chockalingam, Alethea Appavu, Sabarish Chockalingam *(2012-2013; Senior Design Project/ Capstone Project.)*

Major Qualifying Projects (Capstone design, full academic year):

Max Ardini, Charity Reed, Amirhossein Farvardin "*Upper Extremity Physical Activity Survey"* 2013-14
Marlisa Cardoso, Amy Babeu, Erin LaRoche, Rachael Matty "*Optimizing the MOLLE for the female soldier"* 2013-14 ***Winner, Provost's Award for MQP Project Presentation Day**
Andrew Galanis (BME), Joshua Philipou (BME), Nicholas Barreto (BME) *"A radiolucent loading device for computed tomography"* 2014-15
Emily Geer (BME), Tessa Hulbert (BME), Alexandrea Dustin (BME) *"A Dynamic Elbow Flexion Simulator for Cadaveric Testing of UCL Injury and Reconstruction"* 2014-15
Victoria Fleek (BME), Domenick Mastascusa (BME), Rachel Hesse (BME/ME), Lauren Frank (BME), Samara Garcia (BME) *"Thumb CMC Joint Biomechanics: A Novel Device for Dynamic Splinting"* 2014-15
Olivia Bennett (ME), SarahRose Gabor (BME), Samantha Neeno (BME) *Designing an assistive mobility device to aid in geriatric sit to stand*. 2015-16
Mary Kate Bindas (BME), Kathleen Correia (BME), Kate Piotrowicz (BME). *Versatile data acquisition system for upper extremity force sensing*, 2015-16
Ethan Paul (ME) *Unpowered assistive knee brace for sit-to-stand transition.* 2016-17
Brandon Lam (RBE/ME), David Laovoravit (RBE), Nathan Stomberg (BME) *Magneforce: validation of a modular tri-axial force sensor for gait analysis.* 2016-17

Elizabeth Walfield (BME), Mushtaq Zuhairi (ME), Norma Bachman (BME), Oluwajomiloju Olaode (BME) *Design of a canine prosthesis for front limb deformities*, 2016-17

Jennifer Golden (BME, ME), Ahmed Hakim (BME), Hannah Sattler (ME) *Design of a non-invasive device to measure bone strength recovery of distal radius fractures for use with HR-pQCT imaging*, 2016-17

Daniel Amirault (BME), Maddison Caron (BME), Julie McLarnon (BME), Alex Witkin (BME). *Fracture healing analysis: creating a micro-displacement of distal radii to diagnose healing defects*, 2017-18

Jessica Cheu (BME), Robert Kirch (BME), Stephanie Silvestris (BME), Rhaine Sziy (BME) *Design of a wearable sensor system for the estimation of lower limb joint loading*. 2017-18

Julia Dunn (BME), Lauren Guertin (BME), Madison Michaud (BME) *A sensor-based system to detect baseball pitching fatigue for elbow injury prevention.* 2018-19 ***Winner, Provost's Award for MQP Project Presentation Day**

Shion Matsumoto (BME, ME), Rosianna Heidt (BME), Julia Dunn (BME) *Ultrasound imaging of knee joint space for diagnosis and tracking of osteoarthritis*. 2018-19

Lorrie Ataya (ME, BME), David Burgos (ME), Angela Haith (ME), Bryce Wade (ME) *A bicycle for every kid.* 2020-21

Brittany Bolster (BME), Erica Houghton (BME), Christina Freni (BME), Isabelle Jacquith (BME), Sofia Orrico (BME) *Understanding metatarsal bone stress injury – effect of cyclic loading magnitude and direction.* 2020-21

<u>Interactive Qualifying Projects:</u>

Lindsay Gurska, James Vorosmarti, Kevin Walsh, Michael Wilkinson *Assessment of the Rio Mavillas for inclusion in Puerto Rico's Heritage River Program* Puerto Rico Project Center, B16

Casey Arpin, Charles DeWitt, Drew Gelinas, Maryann O'Connell *United States Coast Guard Rio Bayamon housing complex photovoltaic system: Performance review and recommendations*. Puerto Rico Project Center, B16

Harry Chartoff, Steven D'Agostino, Margaret LaRoche, Travis Rossen *Historic Bridge Restoration plan for Para La Naturaleza* Puerto Rico Project Center, B16

Morgan Maiola, Nina Murphy-Cook, Kayla Salmon, Aaron Weeks *Feasible Restoration Proposal of El Yunque National Forest Structures.* Puerto Rico Project Center, B16

Evan Lacroix, Connor Mastropoll, Nathan McNeill, Tony Rodriguez *Risk Assessment and Mitigation in Cantera*. Puerto Rico Project Center, B16

Liam Beal, RiAnna May, Celeste Nicoletti, Maria Snyder. *The assessment and educational outreach of lighting practices for costal light pollution impacting sea turtle ecosystems.* Puerto Rico Project Center, B16

<u>Undergraduate Student Laboratory Research (REU, ISP, and research volunteers)</u>:

REU: Tina Olufunke (Summer, 2014), Julie Tevanen (Summer, 2015), Nicole Zaino (Summer, 2017), Erika Kasen (Summer, 2018)

RET (Research Experiences for Teachers) – Tom Oliva from Worcester Public Schools (summer, 2014).

Undergraduate Student independent study projects and laboratory volunteers: Nour Krayem (2015-16), Nicholas Silva (2015), Jason Lowder (2017, independent study), Joseph Lombardo (2017), Norma Bachman (2015), Samantha Neeno (2015-16), Stephany Ruiz (2014-16), Tessa Hulbert (2015-16), Tyler Marshall (2015-17), Michael DiStefano (2016-2018), Megan Pinette (2016-20), Aaron Rosenthal (2018), Justin Shanahan (2018-2019), Michael DiStefano (2017-20), Talia Vaughn (2020)

RESEARCH INTERESTS

My research focus is on understanding how forces applied to the musculoskeletal system can influence bone and joint health, function, and injury in adult men and women in health and disease. Broadly, my projects address the interaction between mechanical loading environment, bone health, and joint health. We study disuse, healthy adaptation, and overuse in bone and joints. Our approach utilizes a combination of computational modeling, medical image analysis, cadaver mechanical testing, and living human subjects in a clinical research setting.

CONTRIBUTIONS TO SCIENCE

- *In vivo* Bone Adaptation in Living Humans My laboratory is a leader in translating and testing theories of bone adaptation in humans.
- Understanding how bones are loaded i*n vivo* during functional activities. My research has established the importance of applying accurate and physiologically relevant boundary conditions to FE models that predict bone mechanical behavior under loads, and has contributed to improved biomechanical analyses of human kinematics and kinetics, combined with FE models.
- Quantitative Measurements of Bone Structure Over Time using QCT and Subject-Specific FE Analysis. I have adapted previously established quantitative computed tomography (QCT) analysis techniques that were developed for the proximal femur for use at the distal radius, distal femur, and proximal tibia. We have used these techniques to examine time-related changes in three-dimensional bone structure and mechanical behavior in both healthy and clinical populations.
- Clinical Practice Guidelines for Monitoring Bone Health in Individuals with SCI. Since 2018 I have contributed to two different international task forces that were convened to develop evidence-based guidelines and best practices for assessing, monitoring, and treating bone health in individuals with spinal cord injury (SCI).

LEADERSHIP AND SERVICE (TO UNIVERSITY)

2013-present	Member, graduate studies committee (Biomedical Engineering)
2015-2018	Member, Committee on Graduate Studies and Research (CGSR)
2017-2018	Chair, Committee on Graduate Studies and Research
2017-2019	Primary point of contact for collaborative research development between WPI and NSRDEC (Natick Soldier Research and Development Engineering Center)
2018-present	Director, Biomedical Engineering Graduate Studies
2020-present	Chair, Biomedical Engineering Diversity, Equity, and Inclusion Committee

LEADERSHIP AND SERVICE (PROFESSIONAL ORGANIZATIONS)

American Society of Biomechanics:

2007-present Abstract reviewer
2004-2006 Education Committee member
2012, 2017 Program Committee member
2013-2016 Treasurer
2018-2020 Program Chair for 2020 Annual Meeting
(*organized scientific program for 2020 Annual Meeting*)

Orthopaedic Research Society:

2008-2009, 2015-present	Abstract reviewer
2016-2019	New Investigator Mentorship Committee Member
2018-2019	Chair, New Investigator Mentorship Committee
2016, 2017	Representative, Mentoring Award Committee
2019-present	Career Development Task Force Member
2021-2024	Board of Directors member: Career Development Council Chair

International Society for Clinical Densitometry
Member of Position Development task force to develop ISCD Official Position on bone density screening in individuals with spinal cord injury (2018-19; presented at the 2019 Position Development Conference)

Paralyzed Veterans of America
Member of Clinical Practice Guidelines Development task force to develop PVA Clinical Practice Guidelines on the diagnosis and treatment of low bone mass / osteoporosis in individuals with spinal cord injury (2019-present)

Workshops and Scientific Sessions organized and delivered:
Professional Advancement Series: "Crafting a compelling NIH Biosketch" – *ORS Professional Advancement Series,* 2017 Annual Meeting
Professional Advancement Series: "What does your CV say about you?" – *ORS Professional Advancement Series,* 2018 Annual Meeting
Professional Advancement Series: "Meet the Professor / Poster walking tours" – *ORS Professional Advancement Series*, 2019 Annual Meeting
Workshop: "In vivo bone and joint loading – how and why should we measure it?", ORS 2018 Annual Meeting
Scientific Track organizer: "In vivo bone loading and adaptation" 2018 World Congress of Biomechanics Meeting
Symposium organizer: "Quantitative image-based biomechanics" 2019 International Society of Biomechanics/American Society of Biomechanics Annual Meeting
Program Chair, 2020 Annual Meeting of the American Society of Biomechanics (Aug 4-7, 2020)

Sessions Organized or Moderated:
2017 American Society of Biomechanics Conference – "Bone"
2017 Orthopaedic Research Society – "Bone Mechanobiology"
2018 Orthopaedic Research Society – "New Dimensions in the Hand and Wrist"
2018 American Society of Biomechanics Conference – "Bone"
2018 World Congress of Biomechanics – "In vivo bone loading and adaptation"

2019 International Society of Biomechanics/American Society of Biomechanics conference – " Quantitative image-based biomechanics"

Editorial Boards:
IEEE Transactions on Neural Systems and Rehabilitation, Associate Editor 2017-present

PEER-REVIEWED PUBLICATIONS

1. Silva MJ. **Reed KL**. Robertson DD. Bragdon C. Harris WH. Maloney WJ. Reduced bone stress as predicted by composite beam theory correlates with cortical bone loss following cemented total hip arthroplasty. *Journal of Orthopaedic Research*. 17(4):525-31, 1999 Jul

2. **Reed KL**, Brown TD: Elastic Modulus and Strength of Emu Cortical Bone. *The Iowa Orthopaedic Journal* 21:53-58, 2001.

3. **Reed, K.L.**, Brown, T.D., Conzemius, M.G.: Focal Cryogen Insults for Inducing Segmental Osteonecrosis: Computational and Experimental Assessments of Thermal Fields. *Journal of Biomechanics* 36(9):1317-1326, 2003

4. **Reed, K.L.**, Conzemius M.G., Robinson R.A., Brown, T.D.: Osteocyte-Based Image Analysis for Quantitation of Histologically Apparent Femoral Head Osteonecrosis: Application to an Emu Model. *Computer Methods in Biomechanics and Biomedical Engineering* 7(1):25–32, 2004.

5. **Troy KL**, Grabiner MD. Absence of visual feedback about an obstacle influences lower extremity trajectories during the recovery stepping response. *Experimental Brain Research* 161(3):343-350, 2005

6. **Troy KL**, Grabiner MD. Recovery responses to surrogate slipping tasks differ from responses to actual slips. *Gait and Posture* 24: 441-447, 2006

7. Bareither ML, **Troy KL**, Grabiner MD. Bone mineral density of the proximal femur is not related to dynamic joint loading during locomotion. *Bone* 38:125-129, 2006

8. Grabiner MD, **Troy KL**. Attention demanding tasks during treadmill walking reduce step width variability in young adults*., Journal of NeuroEngineering and Rehabilitation (available online)* 2005, **2:**25 doi:10.1186/1743-0003-2-25

9. **Troy, KL**,Grabiner, MD, 2007. Off-axis loads cause failure of the distal radius at lower magnitudes than axial loads: a finite element analysis. *Journal of Biomechanics* 2007; 40(8):1670-1675.

10. **Troy KL**, Lundberg JH, Conzemius MG, Brown TD. 2007 "Habitual Hip Joint Activity Level of the Penned Emu *(Dromaius novaehollandie)*" *Iowa Orthopaedic Journal* 2007;27:17-23.

11. **Troy KL**, Grabiner MD. Asymmetrical ground impact of the hands after a trip-induced fall: Experimental kinematics and kinetics. *Clinical Biomechanics* 2007; 22:1088-1095

12. Grabiner MD, Donovan S, Bareither ML, Marone JR, Hamstra-Wright KL, Gatts S, **Troy KL**. Trunk kinematics and fall risk of older adults: translating biomechanical results to the clinic. *Journal of Electromyography and Kinesiology.* 2008 Apr;18(2):197-204.

13. Dingwell JB, Robb RT, **Troy KL**, Grabiner MD. Effects of an attention demanding task on dynamic stability during treadmill walking *Journal of NeuroEngineering and Rehabilitation,* 2008 Apr 21;5(1):12

14. **Troy KL**, Donovan SJ, Marone JM, Bareither ML, Grabiner MD. Modifiable performance domain risk-factors associated with slip-related falls. *Gait and Posture,* 2008 Oct;28(3):461-5

15. Bareither ML, Grabiner MD, **Troy KL**. Habitual site-specific upper extremity loading is associated with increased bone mineral of the ultradistal radius in young women. *Journal of Women's Health* 2008 Dec; 17(10) 1577-81

16. **Troy KL**, Donovan SJ, Grabiner MD. Theoretical contribution of the upper extremities to reducing trunk extension following a laboratory-induced slip. *Journal of Biomechanics,* 2009 42(9), p 1339-1344

17. **Troy KL**, Brown TD, Conzemius MG. Contact stress distributions on the femoral head of the emu (*Dromaius novaehollandiae*). *Journal of Biomechanics,* 2009 42(15), p. 2495-500.

18. **Troy KL** Biomechanical validation of upper extremity exercise in wheelchair users: design considerations and improvements in a prototype device *Disability and Rehabilitation: Assistive Technology,* 2011 6(1) p.22-28

19. Edwards WB, **Troy KL**. Number Crunching: How and when will numerical models be used in the clinical setting? *Current Osteoporosis Reports,* 2011 9(1), p.1-3

20. Edwards WB, **Troy KL**, Derrick TR. On the filtering of intersegmental loads during running *Gait and Posture,* 2011 34(3), p.435-8

21. Marone JR, Rosenblatt NJ, **Troy KL**, Grabiner MD. Fear of falling does not alter the kinematics of recovery from an induced trip. *Archives of Physical Medicine and Rehabilitation*, 2011 92(12):2093-5

22. Edwards WB, **Troy KL**. Simulating distal radius fracture strength using biomechanical tests: influence of boundary conditions. *Journal of Biomechanical Engineering*, 2011 133(11): 114501

23. Edwards WB, **Troy KL**. Finite element prediction of surface strain and fracture strength at the distal radius. *Medical Engineering and Physics,* 2012 34(3):290-8

24. Bhatia VA, **Troy KL**. A small-scale mechanical loading and testing device: validation and application to a mouse tibia loading model *Experimental Techniques, 2012, available online* DOI: 10.1111/j.1747-1567.2012.00843.x

25. Edwards WB, **Troy KL**. A linear actuated torsional device to replicate clinically relevant spiral fractures in long bones. *Proceedings of the Institution of Mechanical Engineers, Part H, Journal of Engineering in Medicine,* 2012, 226(9):729-33

26. Grabiner MD, Bareither ML, Gatts S, Marone JR, **Troy KL**. Task-specific training reduces trip-related fall risk in women. *Medicine and Science in Sports and Exercise,* 2012 44(12):2410-4

27. Edwards, W.B., Schnitzer, T.J., & **Troy, K.L**. Bone mineral loss at the hip in acute spinal cord injury. *Osteoporosis International,* 2013 Mar 7. doi: 10.1007/s00198-013-2323-8 [Epub ahead of print]

28. Wang VM, Sandy J, Plaas A,**Troy KL**, Mikecz K. Controlled exercise removes the chondroid matrix and promotes full recovery of Achilles tendon mechanical properties in wild type, but not ADAMTS-KO mice in a novel *in vivo* tendinopathy model. *Journal of Orthopaedic Research*, 2013 Jun 10. doi: 10.1002/jor.22398. [Epub ahead of print]

29. Edwards, W.B., Schnitzer, T.J., **Troy, K.L.** Torsional stiffness and strength of the proximal tibia are better predicted by finite element models than DXA or QCT. *Journal of Biomechanics*, 2013 Jun 21;46(10):1655-62.

30. **Troy K.L.**, Edwards W.B., Bhatia, V.A., Bareither, M.L. An in vivo loading model to examine bone adaptation in humans: a pilot study. *Journal of Orthopaedic Research,* 2013 Sep;31(9):1406-13

31. Edwards, W.B., Schnitzer, T.J., **Troy, K.L**. Bone mineral loss at the knee in acute spinal cord injury. *Osteoporosis International,* 2014 Mar;25(3):1005-15

32. Edwards, W.B., Schnitzer, T.J., **Troy, K.L.** The mechanical consequence of actual bone loss and simulated bone recovery in acute spinal cord injury. *Bone* 2013 Dec 17;60C:141-147. doi: 10.1016/j.bone.2013.12.012. [Epub ahead of print]

33. **Troy, K.L.**, Munce, T.A., Longworth, J.A. An exercise trial targeting posterior shoulder strength in manual wheelchair users: pilot results and lessons learned. *Disability and Rehabilitation: Assistive Technology*, 2015;10(5):415-20. doi: 10.3109/17483107.2014.905644.

34. Edwards, W.B., Schnitzer, T.J.,**Troy K.L.** Reduction in proximal femoral strength in patients with acute spinal cord injury *Journal of Bone and Mineral Research*, 2014 Sep;29(9):2074-9

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44. **Troy KL**, Morse LR. Measurement of bone: Diagnosis of SCI-induced osteoporosis and fracture risk prediction. *Topics in Spinal Cord Injury and Rehabilitation* 2015; 21(4):267-274

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46. Fang, Y., Morse, LR., Nguyen, N., Tsantes, NG., **Troy, KL**. Anthropometric and Biomechanical Characteristics of Body Segments in Persons with Spinal Cord Injury. J Biomech. 2017 Apr 11;55:11-17. doi: 10.1016/j.jbiomech.2017.01.036. Epub 2017 Feb 3.

47. Johnson JE, **Troy KL**. Validation of a new multiscale finite element analysis approach at the distal radius. Med Eng Phys. 2017 Jun;44:16-24 doi: 10.1016/j.medengphy.2017.03.005.

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49. Johnson JE, **Troy KL** Simplified boundary conditions alter cortical/trabecular load sharing at the distal radius; a multiscale finite element analysis. Journal of Biomechanics, 2018 Jan 3;66:180-185

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52. Johnson JE, **Troy KL**. Moderate-to-heavy smoking in women is associated with a compromised distal radius cortical microstructure. Archives of Osteoporosis 2018 Aug 23;13(1):89

53. Mancuso ME, Johnson JE, Ahmed SS, Butler TA, **Troy KL**. Distal radius microstructure and finite element bone strain are related to areal bone mineral density and site-specific loading in premenopausal women. Bone Rep. 2018 Apr 14;8:187-194

54. **Troy KL**, Mancuso ME, Butler TA, Johnson JE. Exercise Early and Often: Effects of Physical Activity and Exercise on Women's Bone Health. Int J Environ Res Public Health. 2018 Apr 28;15(5). pii: E878

55. **Troy KL**, Edwards WB. Practical considerations for obtaining high quality quantitative computed tomography data of the skeletal system. Bone. 2018 May;110:58-65.

56. Edwards WB, Simonian N, Haider IT, Anschel AS, Chen D, Gordon KE, Gregory EK, Kim KH, Parachuri R, **Troy KL**, Schnitzer TJ. Effects of Teriparatide and Vibration on Bone Mass and Bone Strength in People with Bone Loss and Spinal Cord Injury: A Randomized, Controlled Trial. J Bone Miner Res. 2018 Oct;33(10):1729-1740.

57. Kuxhaus L, **Troy KL**. Bad to the Bone: Multifaceted Enrichment of Open-Ended Biomechanics Class Projects. J Biomech Eng. 2018 Aug 1;140(8)

58. **Troy KL**, Scerpella TA, Dowthwaite JN. Circum-menarcheal bone acquisition is stress-driven: A longitudinal study in adolescent female gymnasts and non-gymnasts. J Biomech. 2018 Sep 10;78:45-51.

59. Morse LR, **Troy KL,** Fang Y, Nguyen N, Battaglino RA, Goldstein R, Gupta R, Taylor JA. Combination therapy with zoledronic acid and FES-row training mitigates bone loss in the

paralyzed legs: results of a randomized comparative clinical trial. JBMR Plus 20 February 2019 https://doi.org/10.1002/jbm4.10167

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61. Askarinejad S, Johnson JE, Rahbar N, **Troy KL**. Effects of loading rate on the mechanical behavior of the femur in falling condition. J Mech Behav Biomed Mater. 2019 Aug;96:269-278

62. Morse LR, Biering-Soerensen F, Carbone LD, Cervinka T, Cirnigliaro CM, Johnston TE, Liu N, **Troy KL**, Weaver FM, Craven BC. Bone Mineral Density Testing in Spinal Cord Injury: the 2019 ISCD Official Positions. Journal of Clinical Densitometry, 2019 Oct - Dec;22(4):554-566. doi: 10.1016/j.jocd.2019.07.012. Epub 2019 Aug 3.

63. **Troy KL**, Mancuso ME, Johnson JE, Wu Z, Schnitzer TJ, Butler TA. Bone adaptation in adult women is related to loading dose: A 12-month randomized controlled trial. Journal of Bone and Mineral Research, 2020 Jul;35(7):1300-1312. doi: 10.1002/jbmr.3999

64. Kimpara H, Mbanisi KC, Li Z, **Troy KL**, Prokhorov D, Gennert MA Force anticipation and its potential implications on feedforward and feedback human motor control. Human Factors 2020 Mar 10:18720819900842. doi: 10.1177/0018720819900842

65. **Troy KL**, Fellin RE, Sattler HE, Ventura JD. How does bone architecture relate to loading in first-time marathoners? A pilot study. Medicine & Science in Sports and Exercise, *in revision*

66. Mancuso ME, **Troy KL**. Relating bone strain to local changes in radius microstructure following 12 months of axial forearm loading in women. Journal Biomechanical Engineering, 2020 Aug 26;142(11):111014. doi: 10.1115/1.4048232.

67. Douglas S, **Troy KL**, Tenforde AS. Radiographic pattern to recognize of overuse injury in runners: the ipsilateral pubic ramus and sacral bone stress injury. PM&R Journal 2020 Dec;12(12):1279-1280. doi: 10.1002/pmrj.12436

68. Fang, Y, Morse LR, Nguyen N, Battaglino RA, Goldstein RF, **Troy KL**. Functional electrical stimulation (FES) assisted rowing combined with zoledronic acid, but not alone, preserves distal femur strength and stiffness in people with chronic spinal cord injury. Osteoporosis International. 2021 32 (3), 549-558

69. **Troy KL**, Mancuso ME, Johnson JE, Butler TA, Ngo BH, Schnitzer TJ. Dominant and nondominant distal radius microstructure: predictors of asymmetry and effects of a unilateral loading intervention. Bone Reports, 2021 (14) 101012

70. **Troy KL,** Davis IS, Tenforde AS. A Narrative Review of Metatarsal Bone Stress Injury in Athletic Populations: Etiology, Biomechanics, and Management, Physical Medicine and Rehabilitation. 2020 Nov 6. doi: 10.1002/pmrj.12518.

71. AS Tenforde, S DeLuca, AC Wu, KE Ackerman, M Lewis, MJ Rauh, BHeiderscheit, BJ Krabak, E Kraus, W Roberts, **KL Troy**, MT Barrack. Prevalence and Factors Associated with Bone Stress Injury in Middle School Runners Physical Medicine and Rehabilitation. 12 July 2021 https://doi.org/10.1002/pmrj.12673

72. Mancuso ME, Wilzman AR, Murdock KE, **Troy KL**. Effect of external stimuli on human bone: a narrative review. Progress in Biomedical Engineering *in review*

73. Mattson NE, Morse LR, Battaglino R, Nguyen N, Tefertiller C, **Troy KL.** Kinematics and kinetics of exoskeleton-assisted walking in people with spinal cord injury: Comparison of two different exoskeletons. American Journal of Physical Medicine and Rehabilitation, *in review*

74. Hoenig T, Nelson E, **Troy KL**. Wolfarth B, Heiderscheit B, Hollander K. Running-related injury: when does it start and end? Feasibility, preliminary validity, and German translation of the University of Wisconsin Running and Recovery Index. Physical Therapy in Sport. *In press.*

75. Battaglino RA, Linnman C, Olson J, Nguyen N, Troy KL. hsa-MiR-19a-3p and hsa-MiR-19b-3p Are Associated with Spinal Cord Injury-Induced Neuropathic Pain: Findings from a Genome-wide microRNA Expression Profiling Screen. *Neurotrauma Reports; in press*

INVITED PUBLICATIONS

1. **Reed-Troy KL**, Grabiner MD. Neuromuscular and biomechanical elements of postural equilibrium. in Gait Disorders Evaluation and Management eds. Hausdorff JM and Alexander NB. Taylor and Francis Group, Boca Raton, FL 2005 p. 101-115

2. **Troy KL,** Tetreault K, Goodworth AD, Ji S, Popovic M. Biomechanics and biomechatronics in sports, exercise, and entertainment. In Biomechanics and Biomechatronics ed. Popovic M. Elsevier Kidlington, Oxford, UK 2018

3. Davis IS, **Troy KL**. Gait Retraining for Tibial Bone Stress Injuries in Runners. In; Tenforde and Fredericson. Bone Stress Injuries. New York, NY: Demos Publishing; *in press*

4. Douglas S, **Troy KL**, Tenforde AS. Low Risk Foot and Ankle Injuries. In; Tenforde and Fredericson. Bone Stress Injuries. New York, NY: Demos Publishing; *in press*

INVITED PRESENTATIONS

1. Faculty presenter, **Fall Prevention and Balance: A Rehabilitation Challenge and Opportunity: Prevention, Risk Assessment, and Interventions**, Rehabilitation Institute of Chicago, August 5-6 2004

2. Faculty presenter, **Fall Prevention & Balance: An Interdisciplinary Approach**, Rehabilitation Institute of Chicago, April 21-22, 2005

3. Research Seminar, **Putting the Brakes on Breaks: Aging, falls, and fractures**, Clemson University Dept. of Bioengineering, December 10, 2005

4. Departmental Seminar, **Putting the Brakes on Breaks: Aging, falls, and fractures,** University of Michigan Division of Kinesiology, January 6, 2006

5. Aging Initiative Speaker Series, **Stumbling onto a Solution: Trips and Slips in the Superannuated,** University of Illinois, Urbana-Champaign, March 6, 2006

6. Departmental Seminar, **It's all in the wrist: Understanding fall-related fractures**, University of Illinois at Chicago Department of Bioengineering, September 22, 2006

7. **Fall-related fractures and other topics of impact**, Midwest Connective Tissue Workshop at Rush University, October 20-21, 2006

8. Departmental Seminar, **Building Better Bones**, University of Illinois Medical Center, Department of Endocrinology, March 15, 2007

9. Departmental Seminar, **Forcing yourself to have Stronger Bones**, Rush University Department of Anatomy and Cell Biology, December 18, 2009

10. Faculty Presenter, **Osteoporosis: Boning up on the Latest Evidence**, Annual Primary Care Meeting at Dartmouth College, October 7-8, 2010

11. Northwestern University Bone Health and Osteoporosis Program (NUBOP), **Microstrains and Mega-Pascals: Using Engineering Principals to Design Osteogenic Exercises**, Chicago, IL, January 5, 2011

12. Departmental Seminar, **Building Better Bones through Biomechanics**, Rensselaer Polytechnic Institute, Troy, NY May 21, 2011

13. Faculty Presenter, **Trip and... Fall? A Biomechanics Perspective on Fall Avoidance,** Falls Prevention Conference, Northern New England Geriatric Education Center, Hanover, NH. June 25, 2012

14. Departmental Seminar, **Physical Activity and Bone Health: A Biomechanics Perspective**, Department of Physical Therapy, University of Illinois at Chicago, September 20, 2012

15. American Medical Association Wellness Program, **Putting your best foot forward: What gait analysis teaches us about health and disease**, Chicago, IL October 10, 2012

16. American Association for Physical Medicine and Rehabilitation 2012 Annual Meeting, Workshop titled, **Bone health in persons with spinal cord injury**, Atlanta, GA. November 16, 2012

17. Departmental Seminar, "**Quantifying the input/output relationship between in vivo mechanical loads and bone adaptation in women"** Department of Biomedical Engineering, Worcester Polytechnic Institute, Worcester, MA. Feb 21, 2013

18. Keynote Address, **Computational assessments of bone strength: What insights can models provide?**, Society for Experimental Mechanics, 3rd Symposium on the mechanics of biological systems and materials, Lombard, IL, June 3, 2013

19. Keynote Address, **Fall Prevention** Vermont Geriatric Education Conference, Burlington, VT, April 9, 2013

20. Faculty Presenter, "**Function of the Mature Skeleton and Application of Wolff's Law**" for University of Illinois at Chicago Department of Orthopaedic Surgery course titled, "Pathophysiologic Background of Orthopaedic Disorders". Chicago, IL, April 28, 2013

21. Departmental Seminar, **"Quantifying the input/output relationship between in vivo mechanical loads and bone adaptation in women"**, Department of Biomedical Engineering, Washington University in St. Louis, St. Louis, MO, April 5, 2013

22. Departmental Seminar, **"Quantifying the input/output relationship between in vivo mechanical loads and bone adaptation in women"**, Department of Anatomy and Cell Biology, Rush University Medical Center, Chicago, IL May 6, 2013

23. American Spinal Injury Association 2013 Annual Meeting, Workshop titled, **"Mechanical Loading and Bone Strength: Boning up on the Latest Evidence"**, Chicago IL May 8, 2013

24. Departmental Seminar, **"Developing a mechanism-based approach to physical activity interventions for bone health: What advice should I give to my mother?**, Department of Kinesiology, University of Massachusetts, Amherst, MA February 18, 2014

25. Departmental Seminar, **"Subject-specific computational models in the clinic: developing mechanics-based outcomes to assess bone health"**, Department of Mechanical Engineering, Clarkson University, Potsdam, NY March 28, 2014

26. Faculty presenter, **Mechanical Consequences of Bone Loss After Spinal Cord Injury**, Rehabilitation Institute of Chicago, June 25-27, 2014

27. Presenter in the American Society of Biomechanics Symposium on Subject-specific modeling, **Individual variations in bone mechanical strain environment: implications for osteogenic exercise** *World Congress of Biomechanics*, Boston, MA; July 6-11, 2014

28. Grand Rounds, **That which throws the stone foresees the bone: physical activity and bone strength**, Department of Pathology, University of Minnesota Medical School, September 10, 2014

29. Seminar, **What's going on inside your bones? Mechanical insights into bone adaptation**, Bouxsein Lab, Harvard Center for Advanced Orthopaedic Studies, December 13, 2014

30. Seminar, **"What's going on inside your bones? Linking what we do to how our bones adapt"**, Endocrine Fellows group, Massachusetts General Hospital, May 1, 2015

31. Workshop, **"What is Biomedical Engineering?"**, career exploration and development workshop at Springfield Technical Community College, Springfield, MA July 8, 2015

32. Workshop, "**What is Biomechanics"**, educational workshop delivered as part of Worcester Polytechnic Institute's "Women in Science" summer program for girls age 12-15, July 2015.

33. Troy KL Webinar presenter: **Getting the Most out of your Postdoc**. 12/12/16 Orthopaedic Research Society Online Education Series

34. Troy KL. **Bone Structure and Adaptation in Adulthood.** (invited presentation as part of a symposium titled "Skeletal Structure as Framework and Limitation in Health and Disease ") 6/14/16 Biomechanics and Neuromuscular Control of Movement (BANCOM) Conference

35. Troy KL and Hanzlik J **Professional Development Session: Crafting Your NIH Biosketch** workshop, delivered at the 2017 Annual Meeting of the Orthopaedic Research Sosciety, March 18-22, 2017

36. Troy KL, **"Stressing out about your bones"** Presentation at the Spaulding National Running Center, Boston, MA, March 25, 2017

37. Troy KL, **"In vivo bone and joint loading – how and why should we measure it?"** Workshop organized and presented at the 2018 Annual meeting of the Orthopaedic Resaerch Society. New Orleans, LA March 9-12, 2018.

38. Troy KL **Professional Development Session: What does your CV say about you?** Workshop organized and presented at the 2018 Annual meeting of the Orthopaedic Resaerch Society. New Orleans, LA March 9-12, 2018.

39. Troy KL **Quantitative Imaging and Mechanics – what can we learn about bone adaptation and healing?** Grand Rounds presentation at Beth Israel Deaconess Dept. of Orthopaedics and Rehabilitation. Boston, MA Oct 24, 2018

40. Troy KL. **Sticks and stones may break your bones, but exercise should help, right?** Invited podium presentation for 2019 American Society of Biomechanics/ International Society of Biomechanics Annual Meeting, Calgary, Alberta, Canada August 4-9, 2019

41. Troy KL **Bone response to exercise: what should I tell my mother?** Seminar presentation, Department of Orthopaedics and Rehabilitation, Rhode Island Hospital / Brown University, Providence, RI Oct 27, 2021

PEER REVIEWED POSTERS AND PRESENTATIONS

1. **Reed K.L**., Brown T.D., Conzemius M.G.: Temperature Fields Surrounding a New Instrument for a Cryogenically-Induced Osteonecrosis Animal Model. *Proceedings of the 2000 Annual ARCO Meeting and International Symposium,* p. 13

2. **Reed K.L**., Brown T.D.: Elastic, Yield, and Ultimate properties of Emu Cortical Bone, *Proceedings of the 4th Combined Meeting of the Orthopaedic Research Societies of The U.S.A., Canada, Europe, and Japan,* pp.35-36, 2001

3. **Reed K.L.**, Brown T.D., Conzemius M.G.: Design and Evaluation of a Cyrogenic Probe to Induce Osteonecrosis in a Precise Location. *Proceedings of the 25th Annual Conference of the American Society of Biomechanics,* p.19, 2001

4. **Reed K.L.**, Brown T.D.: Elastic, Yield, and Ultimate Properties of Emu Cortical Bone. *Proceedings of the 25th Annual Conference of the American Society of Biomechanics,* p.73-74, 2001

5. **Reed K.L**., Brown T.D., Conzemius M.G.: Design and Evaluation of a Cryogenic Probe to Induce Osteonecrosis in a Precise Location. *Proceedings of the 25th Annual Conference of the American Society of Biomechanics,* p.19, 2001.

6. **Reed K.L.**, Robinson R.A., Conzemius M.G., Brown T.D.: An Algorithm to Quantify Segmental Lesions in Necrotic Femoral Heads, *Proceedings of the 10th Annual Symposium on Computational Methods in Orthopaedic Biomechanics*, p.24, 2002.

7. **Reed K.L.**, Brown T.D., Conzemius M.G.: Thermal Finite Element Analysis of Osteocyte Kill Zones Achieved with a Cryo-Insult Probe. *Proceedings of the IV World Congress of Biomechanics,* p. 457, 2002.

8. **Reed K.L**., Robinson R.A., Conzemius M.G., Brown T.D.,: An Algorithm to Quantify Segmental Lesions in Necrotic Femoral Heads. *Proceedings of the IV World Congress of Biomechanics,* p. 469, 2002.

9. **Reed, K.L.**, Robinson, R.A., Conzemius, M.G., Brown, T.D.: An Algorithm to Quantify Segmental Lesions in Necrotic Femoral Head. *Transactions of the 49th Annual Meeting of the Orthopaedic Research Society,* p. 0151, 2003.

10. **Reed, K.L.**, Brown, T.D., Conzemius, M.G.: Thermal Finite Element Analysis of Experimental Osteonecrosis Lesions Achieved with a Cryo-Insult Probe. *Transactions of the 49th Annual Meeting of the Orthopaedic Research Society,* p. 0154, 2003.

11. **Reed, K.L.**, Brown, T.D.: Determination of Contact Stress Distributions on Emu Femoral Heads. *Transactions of the 49th Annual Meeting of the Orthopaedic Research Society,* p. 0429, 2003.

12. Brown, TD, **Reed, KL**, Conzemius, MG "Modeling Approaches in Hip Joint Biomechanics: The Emu as an Animal Model of Femoral Head Necrosis." *Proceedings of the International Society of Biomechanics IXI Congress*, Dunedin, New Zealand, July 6–11, 2003.

13. **Reed, KL**, Conzemius, MG, Brown, TD. "Determination of Contact Stress Distributions on Emu Femoral Heads." *Proceedings of the 27th Annual Meeting of the American Society of Biomechanics*, Toledo, Ohio, September 25–27, 2003, p. 10.

14. **Troy, KL,** Gavin CG, Grabiner MD. "Wrist kinematics and kinetics during ground impact following a fall" *Proceedings of the 28th Annual Meeting of the American Society of Biomechanics*. September, 2004. Portland, OR

15. **Troy, KL,** Grabiner MD**.** "The presence of an obstacle influences the stepping response during simulated and real trips" *Proceedings of the 28th Annual Meeting of the American Society of Biomechanics.* September, 2004. Portland, OR

16. **Troy, KL**, Gavin CG, Grabiner MD. "The effect of hand position on wrist kinematics at landing from a forward fall from a kneeling position" *Proceedings of the 28th Annual Meeting of the American Society of Biomechanics*. September, 2004. Portland, OR

17. Gavin CG, **Troy, KL,** Grabiner MD. "Quantification of upper extremity motion during a trip-induced fall in older adults" *Proceedings of the 28th Annual Meeting of the American Society of Biomechanics*. September, 2004. Portland, OR

18. **Reed-Troy, KL**, Gavin, CG, Grabiner, M.D. "Wrist kinematics and kinetics during ground impact following a fall" *Transactions of the 51st Annual Meeting of the Orthopaedic Research Society*, p. 601A, 2005

19. Bareither ML**, Reed-Troy KL**, Grabiner MD. "Bone mineral density of the proximal femur is not related to dynamic joint loading during locomotion" *Proceedings of the 29th Annual Meeting of the American Society of Biomechanics* Cleveland, OH; 2005

20. **Reed-Troy KL**, Grabiner MD. "Recovery responses to surrogate slips are different than actual slips" *Proceedings of the 29th Annual Meeting of the American Society of Biomechanics* Cleveland, OH; 2005

21. **Reed-Troy KL**, Grabiner MD. "Wrist kinetics during impact are affected by hand symmetry" *Proceedings of the 29th Annual Meeting of the American Society of Biomechanics* Cleveland, OH; 2005

22. Hamstra-Wright KL, **Reed-Troy KL**, Grabiner MD "Skill Acquisition occurs during fall-preventive motor response training" *Proceedings of the 29th Annual Meeting of the American Society of Biomechanics* Cleveland, OH; 2005

23. **Troy KL**, Grabiner MD. "Development and validation of a contact model to simulate Colles' fractures" *Transactions of the 52nd Annual Meeting of the Orthopaedic Research Society,* March 19-22, 2006 (poster)

24. **Troy KL,** Donovan SJ, Marone JR, Bareither ML, Grabiner MD. "Concurrent control of multiple segments is required to avoid falling due to a slip" *World Congress of Biomechanics* Munich, Germany, 2006 *(invited)*

25. **Troy KL**, Grabiner MD. "Achievable changes in bone mineral density influence predicted distal radius fracture load" *World Congress of Biomechanics* Munich, Germany, 2006 *(invited)*

26. Fowler PM, **Troy KL**, Grabiner MD. "Mid-swing kinematic trunk states predict step width" *World Congress of Biomechanics* Munich, Germany, 2006 *(invited)*

27. Chu JJ, **Troy KL**, Fowler PM, Jessiman AW, Greenwald RM, Grabiner MD. "Validation of measuring basic stride kinematics from a treadmill with embedded pressure sensing" *World Congress of Biomechanics* Munich, Germany, 2006 (poster)

28. Bareither ML, **Troy KL**, Grabiner MD. "Increased radial bone mineral density in young women – a result of axial loading?" *14th Annual Congress on Women's Health* Hilton Head, SC, 2006 (poster)

29. **Troy KL**, Grabiner MD "Off-axis loads cause failure of the distal radius at lower magnitudes than axial loads: a finite element analysis" *Proceedings of the30th Annual Meeting of the American Society of Biomechanics* Blacksburg, VA; 2006

30. **Troy KL**, Grabiner MD "Off-axis loads cause failure of the distal radius at lower magnitudes than axial loads: a finite element analysis" *Transactions of the 53rd Annual Meeting of the Orthopaedic Research Society,* February 11-14, 2007 (poster)

31. **Troy KL,** Donovan SJ, Grabiner MD "Lateral falls after a slip are affected by medial/lateral slipping foot displacement" *Proceedings of the 31st Annual Meeting of the American Society of Biomechanics* Stanford, CA; 2007

32. Donovan SJ, **Troy KL,** Grabiner MD "Rapid shoulder flexion after a slip may assist fall avoidance" *Proceedings of the 31st Annual Meeting of the American Society of Biomechanics* Stanford, CA; 2007

33. **Troy KL**, Grabiner MD "Mechanical loading of the distal radius causes a temporary decrease in BMC in young women" *Transactions of the 54th Annual Meeting of the Orthopaedic Research Society,* March 2-5, 2008 (poster)

34. **Troy KL**, Donovan SJ, Grabiner MD "Theoretical contribution of the upper extremities to reducing trunk extension following a laboratory-induced slip" *Transactions of the 55th Annual Meeting of the Orthopaedic Research Society*, February 22-25, 2009 (poster)

35. Bhatia VA, **Troy KL** "Mechanical loading causes an acute and temporary decrease in the stiffness of mouse tibiae" *Proceedings of the 33rd Annual Meeting of the American Society of Biomechanics* State College, PA; 2009

36. Hofmann CN, **Troy KL** "Biomechanical evaluation and redesign of an accessory unit for exercise in manual wheelchair users" *Proceedings of the 33rd Annual Meeting of the American Society of Biomechanics* State College, PA; 2009

37. Bhatia VA, **Troy KL** "Mechanical loading causes an acute and temporary decrease in the BMC and stiffness of mouse tibiae" *Transactions of the 56th Annual Meeting of the Orthopaedic Research Society*, March 6-10, 2010 (poster)

38. **Troy KL**, Edwards, WB "A human model of bone adaptation: response to short term mechanical loading" *Transactions of the 56th Annual Meeting of the Orthopaedic Research Society*, March 6-10, 2010 (poster)

39. **Troy KL**, Bhatia VA "Mechanical loading stimulates localized bone adaptation in the mouse tibia" *International Bone and Mineral Society Sun Valley Workshop on Musculoskeletal Biology,* August 1-4, 2010 (poster)

40. Bhatia VA, **Troy KL** "Mechanical loading of the mouse tibia stimulates localized bone adaptation" *Proceedings of the 34th Annual Meeting of the American Society of Biomechanics* Providence, RI; 2010

41. **Troy KL**, Edwards WB "Relationships between dual energy x-ray absorptiometry (DXA) and computed tomography (CT) measures of bone and their ability to predict fracture load" *Proceedings of the 34th Annual Meeting of the American Society of Biomechanics* Providence, RI; 2010 (poster)

42. Edwards WB, **Troy KL** "Changes in cross-sectional stress at the distal radius following short-term mechanical loading" *Proceedings of the 34th Annual Meeting of the American Society of Biomechanics* Providence, RI; 2010 (poster)

43. Edwards WB, **Troy KL** "Finite element prediction of surface strain and failure load at the distal radius using simplified boundary conditions" *Proceedings of the 34th Annual Meeting of the American Society of Biomechanics* Providence, RI; 2010

44. Bhatia VA, **Troy KL** "Alendronate diminishes the short term, localized effects of mechanical loading in the tibiae of female C57BL/6 mice" *Transactions of the 57th Annual Meeting of the Orthopaedic Research Society*, January 13-16, 2011

45. Edwards WB, **Troy KL** "Finite Element Prediction of Distal Radius Fracture Strength: Validation and Application to a Short-Term Mechanical Loading Intervention" *Transactions of the 57th Annual Meeting of the Orthopaedic Research Society*, January 13-16, 2011 (poster)

46. Edwards WB, **Troy KL** "Determinants of finite element predicted fracture strength of the distal radius" *19th Annual Symposium on Computational Methods in Orthopaedic Biomechanics*, January 12, 2011

47. Pollard T, Lilley C, Bedran-Russo A, **Troy KL**, Monaghan P "Effect of force and roughness on the elastic modulus of the resin/dentin interface" *ASME Applied mechanics and materials conference*, May 31-June 2, 2011

48. Longworth, J, **Troy KL** "Kinematic variability of the trunk is related to shoulder variability during wheelchair propulsion" *Proceedings of the 35th Annual Meeting of the American Society of Biomechanics* Long Beach, CA; 2011

49. Edwards WB, **Troy KL** "Short term mechanical loading increases trabecular bone mineral content and moments of inertia in the radius of young women" *Proceedings of the 35th Annual Meeting of the American Society of Biomechanics* Long Beach, CA; 2011

50. **Troy KL**, Edwards WB "Translating the strain stimulus equation from animals to humans" *Proceedings of the American Society for Bone and Mineral Research* San Diego, CA; 2011

51. Bhatia, VA, Edwards WB, **Troy KL** "Effect of image resolution on the accuracy of trabecular morphology and the convergence behavior of micro-CT finite element models of mouse bone" *58th Annual Meeting of the Orthopaedic Research Society*, San Francisco, CA; 2012

52. Edwards WB, Barkema D, Schnitzer TJ, **Troy KL** "The Mechanical Consequence of Acute Bone Loss Following Spinal Cord Injury" *58th Annual Meeting of the Orthopaedic Research Society*, San Francisco, CA; 2012

53. Peterson SJ, **Troy KL,** Braunschweig CL "Use of computed tomography (CT) to evaluate the impact of calories received on body composition changes in obese and non-obese ICU patients" *2012 Annual Meeting of the Obesity Society,* San Antonio, TX; 2012

54. **Troy KL**, Bhatia VA, Edwards WB "Compressive loading of the distal radius improves bone structure in young women" *Proceedings of the 36th Annual Meeting of the American Society of Biomechanics,* Gainesville, FL; 2012 (award finalist)

55. Bhatia VA, Edwards WB, **Troy KL** "Repeatability of image registration and segmentation procedures for CT scans of the human distal radius" *Proceedings of the 36th Annual Meeting of the American Society of Biomechanics,* Gainesville, FL; 2012

56. Edwards WB and **Troy KL** "A linear actuated torsional device to replicate clinically relevant spiral fractures in long bone" *Proceedings of the 36th Annual Meeting of the American Society of Biomechanics,* Gainesville, FL; 2012

57. Edwards WB and **Troy KL** "DXA derived measures of bone mineral can reliably predict mechanical behavior of proximal tibias loaded in torsion" *Proceedings of the 36th Annual Meeting of the American Society of Biomechanics,* Gainesville, FL; 2012

58. Longworth JA and **Troy KL** "Shoulder pain does not affect kinematic variability during wheelchair propulsion" *Proceedings of the 36th Annual Meeting of the American Society of Biomechanics,* Gainesville, FL; 2012

59. **Troy KL** Bhatia VA, Edwards WB "Muscle volume does not affect the osteogenic response to compressive loading in the distal radius of young women" *Proceedings of the American Society for Bone and Mineral Research* Minneapolis, MN; 2012 (plenary session award)

60. Edwards WB, Schnitzer TJ, **Troy KL** "Bone mineral loss at the hip in acute spinal cord injury" *Proceedings of the American Society for Bone and Mineral Research* Minneapolis, MN; 2012

61. Bhatia VA, Edwards WB, **Troy KL** "Predicting bone adaptation at the human distal radius using cadaveric specimens and the Daily Strain Stimulus theory" *59th Annual Meeting of the Orthopaedic Research Society*, San Antonio, TX; 2013

62. Edwards WB, Schnitzer TJ, **Troy KL** "Computed tomography based finite element models can accurately predict stiffness and strength of proximal tibiae loaded in torsion" *59th Annual Meeting of the Orthopaedic Research Society*, San Antonio, TX; 2013

63. Longworth JA, **Troy KL** "A familiarization protocol for wheelchair propulsion" *Proceedings of the 36th Annual Meeting of the American Society of Biomechanics*, Omaha, NE; 2013

64. Edwards WB, **Troy KL**, Schnitzer TJ "Reductions in proximal tibial fracture strength in acute spinal cord injury" *Annual meeting of the American Spinal Injury Association*, Chicago, IL; 2013

65. Edwards WB, Schnitzer TJ, **Troy KL** "The mechanical consequence of actual bone loss and simulated recover in acute spinal cord injury" *Proceedings of the 36th Annual Meeting of the American Society of Biomechanics*, Omaha, NE; 2013

66. Bhatia VA, Edwards WB, **Troy KL** "Finite element prediction of periosteal strain at the human distal radius during a targeted loading task" *Proceedings of the 36th Annual Meeting of the American Society of Biomechanics*, Omaha, NE; 2013

67. Edwards WB, Schnitzer TJ, **Troy KL** "Changes in fracture strength as a function of time since spinal cord injury" *Proceedings of the American Society for Bone and Mineral Research* Baltimore, MD; 2013

68. **Troy KL**, Johnson B, Bareither ML "Physically active women have denser bones and may be less responsive to a mechanical loading intervention" *Proceedings of the American Society for Bone and Mineral Research* Baltimore, MD; 2013

69. Sheean P, Shiffer L, Arroyo C, **Troy, K**, Stolley M. "Vitamin D deficiency and healthy bones in African American breast cancer survivors" *Annual meeting of the American Institute for Cancer Research*, Bethesda, MD; 2013

70. Prasad A, Edwards WB, Marks J, **Troy** KL, Schnitzer TJ "Correlation of DXA and QCT Imaging at the Knee in Adults with Spinal Cord" *Annual meeting of the American Spinal Injury Association,* San Antonio, TX; May 14-17, 2014

71. Johnson JE, **Troy KL** "Higher strains in extension than flexion might partially explain the mechanism of distal radius fractures" *World Congress of Biomechanics*, Boston, MA; July 6-11, 2014

72. Edwards WB, Schnitzer TJ, Troy KL "Reductions in proximal femur strength in patients with acute spinal cord injury" *World Congress of Biomechanics*, Boston, MA; July 6-11, 2014 (Clinical Biomechanics Award Winner)

73. Edwards WB, Simonian N, **Troy KL**, Schnitzer TJ "Changes in proximal tibia bone mineral as a function of time since spinal cord injury" *Annual Meeting of the American Society for Bone and Mineral Research*, Houston, TX; September 12-15, 2014

74. Butler TA, Schnitzer TJ, **Troy KL** "Increased marrow adipose tissue following spinal cord injury" *Annual Meeting of the American Society for Bone and Mineral Research*, Houston, TX; September 12-15, 2014

75. Johnson JE, **Troy KL** "A multiscale approach for the simultaneous analysis of continuum and micro-FE models" *Annual Meeting of the Biomedical Engineering Society*, San Antonio, TX; October 22-24, 2014

76. Johnson JE, **Troy KL** "Application and validation of multiscale modeling to the distal radius" *Annual meeting of the Orthopaedic Research Society*, Las Vegas, NV; March 28-30, 2015

77. Best, A., Holt B, Hamill J, **Troy K** "Trabecular bone strucuture in forefoot and rearfoot endurance runners: implications for interpreting fossil hominin morphology" *Annual Meeting of the Paleoanthropology Society*, San Fransisco, CA; April 14-15, 2015

78. Fang, Y., Morse, LR., Nguyen, N., Tsantes, NG., Troy, KL. "Anthropometric and Biomechanical Characteristics of Body Segments in Persons with Spinal Cord Injury", 40th Annual Meeting of the American Society of Biomechanics, Raleigh, North Carolina

79. Fang, Y., Johnson, JE., Troy, KL. "The Effect of Strap Location on Tibia Strain in Simulated Exoskeleton-Assisted Gait", Orthopaedic Research Society 2016 Annual Meeting, Orlando, Florida

80. Fang, Y., Smith, N., Johnson, JE., Troy, KL. "Comparison of Tibia Strain between Exoskeleton-Assisted Gait and Normal Gait", 39th Annual Meeting of the American Society of Biomechanics, Columbus, Ohio, 2016

81. Mancuso ME, Troy KL. Age, Grip Strength, and Handedness are Related to Distal Radius Microstructure: a Cross-Sectional, HR-pQCT study in Premenopausal Females; Presented at the 2016 Annual Meeting of the American Society of Bone and Mineral Research, September 16-19, 2016 Atlanta Georgia

82. K.L. Troy, T.A. Scerpella, J.N. Dowthwaite An Exploratory Analysis of Modeled Bone Stresses at the Radial Metaphysis in the Context of Circum-menarcheal Gymnastic Loading; Presented at the 2016 Annual Meeting of the American Society of Bone and Mineral Research, September 16-19, 2016 Atlanta, Georgia

83. Julie Tevenan, Megan Mancuso, Tiffiny Butler, Joshua Johnson, and Karen Troy; Dietary and handedness effects on bone microstructure; Presented at the 2016 Annual Meeting of the American Society of Biomechanics, August 2-5, 2016

84. Joshua E. Johnson, Tessa C. Hulburt, David Magit, Karen L. Troy. Development of a Physiologic Elbow Finite Element Model for Normal and Pathologic Simulations; Presented at the 2016 Annual Meeting of the Orthopaedic Research Society, March 5-8, 2016, Orlando, Florida

85. Eric Fabara, Anne O'Brien, Catherine Adans-Dester, Jean-Francois Daneault, Ugo Della Croce, Alessandra Scarton, Paolo Bonato, Karen Troy "Biomechanical Evaluation of Exoskeleton Assisted Gait in Patients with Spinal Cord Injury" 2017 ACRM Annual Conference

86. Henchie TF, Gravallese EM, Bredbenner TL, Troy KL. "A Novel Method to Quantify Joint Deformity in Psoriatic Arthritis" Presented at the 2017 Annual Meeting of the Orthopaedic Research Society, March 19-22, 2017 San Diego, CA

87. Johnson JE, **Troy KL**. Boundary conditions influence cortical and trabecular load sharing at the distal radius. Presented at the 2017 Annual Meeting of the Orthopaedic Research Society, March 19-22, 2017 San Diego, CA

88. Kuxhaus LL, and **Troy KL**. Real-world problem solving and value creation in the biomechanics classroom. Presented at the Summer Biomechanics, Bioengineering, and Biotransport Conference (SB3C), June 21-24, 2017 Tucson, AZ

89. **Troy KL** and Kuxhaus LL. Enhancing the biomechanics classroom with entrepreneurial-mindset learning activities. Presented at the Annual meeting of the American Society of Biomechanics. August 8-11, 2017 Boulder CO

90. Sattler HE, Ventura JD, Fellin RE, **Troy KL**. Bone microarchitecture and running biomechanics in first-time marathon runners. 2017 Annual meeting of the American Society of Biomechanics. Boulder, CO August 8-11, 2017

91. Fang Y, Morse LR, Nguyen N, **Troy KL** The effect of functional electrical stimulation assisted rowing and intravenous zoledronic acid on bone stiffness in spinal cord injury. Presented at the Annual meeting of the American Society of Biomechanics. August 8-11, 2017 Boulder, CO

92. Smith NI, Fabara E, Denault JF, Adans-Dester C, O'Brien A, Scarton A, Della Croce U, Bonato P, **Troy KL**. User biomechanics during exoskeleton-assisted gait: theoretical approach and case study. Presented at the Annual meeting of the American Society of Biomechanics. August 8-11, 2017 Boulder, CO

93. Mancuso ME, Johnson JE, Ahmed SS, **Troy KL**. Strain magnitude influences structural changes in the radius of healthy adult women. Annual Meeting of the American Society of Bone and Mineral Research, September 6-9, 2017 Denver, CO

94. Zaino NL, Fang Y, **Troy KL**. Novel axial forearm loading causes short-term changes to distal radius microstructure in young women. Annual Meeting of the Biomedical Engineering Society, October 11-14, 2017 Phoenix, AZ

95. **Troy KL**, Askarinejad S, Lombardo J, Rahbar N. Rate-dependent fracture strength and crack patterns in the proximal femur. Annual meeting of the Orthpaedic Research Society, March 9-12, 2018 New Orleans, LA

96. Mancuso ME, **Troy KL**. Influence of strain magnitude on radius bone microstructure: a 12-month prospective HRpQCT study in healthy adult women. World Congress of Biomechanics, July 8-12, 2018 Dublin, Ireland (oral presentation)

97. Fang Y, **Troy KL**. Muscle and joint contact forces while woring on an adaptive ergometer. Annual Meeting of the American Society of Biomechanics, August 6-10, 2018 Rochester, MN

98. Fang Y, **Troy KL**. How does ergometer setup and rowing speed affect biomechanics during rowing on an adapted ergometer designed for people with spinal cord injury? Annual Meeting of the American Society of Biomechanics, August 6-10, 2018 Rochester, MN

99. **Troy KL**, Kuxhaus L. Open-ended discussion in the biomechanics class. Annual Meeting of the American Society of Biomechanics, August 6-10, 2018 Rochester, MN

100. Kasen E, Fang Y, Fabara E, Adans-Dester C, O'Brien A, Daneault JF, Della Croce U, Bonato P, Smith N, **Troy KL**. User biomechanics of exoskeleton-assisted gait. Annual meeting of the Biomedical Engineering Society, Oct 16-19, 2018 Philadelphia, PA

101. **Troy KL**, Mancuso ME, Johnson JE, Wu Z, Schnitzer TJ. Do mechanical strain magnitude and rate drive bone adaptation in adult women? A 12-month prospective study.

Annual meeting of the Orthopaedic Research Society, Feb 2-5, 2019 Austin, TX (oral poster presentation)

102. Choate B, **Troy KL**. Developing Methods to Validate a Subject-Specific Magnetic Resonance Based Finite Element Model to Predict Strain in the Femur. 45th Annual Northeast Bioengineering Conference, March 20 - 22, 2019, New Brunswick, NJ (2nd place for student poster competition)

103. Morse LR, Biering-Soerensen F, Carbone LD, Cervinka T, Cirnigliaro CM, Johnston TE, Liu N, **Troy KL**, Weaver FM, Craven BC. The Official Positions of the International Society for Clinical Densitometry: Indications for Bone Density Testing in Spinal Cord Injury, ISCD Position Development Conference, March 20-23, 2019 Kuala Lumpur, Malaysia

104. Mancuso ME, **Troy KL**. Relating bone strain to local changes in radius microstructure following 12 months of axial forearm loading in women. Summer Biomechanics, Bioengineering, and Biotransport Conference, Seven Springs, PA June 25-28, 2019 (finalist for Student Paper competition)

105. Battaglino R, Nguyen N, **Troy K**, Morse L. 25OH Vitamin D levels and leg lean mass are positively associated with bone geometry at the knee in men with chronic SCI. American Spinal Injury Association (ASIA) annual meeting, April 2-5 2019, Waikiki, Hawaii

106. Khurelbaatar T, Fellin R, Ventura J, **Troy KL**. Tibial bone strain influences bone changes following marathon training in novice marathon runners. Annual meeting of the American Society of Biomechanics/International Society of Biomechanics, Calgary, Alberta, Canada. August 4-9, 2019

107. Yousef, M, Nazarian A, **Troy KL** In-Vitro Distal Radial Fracture Healing Assessment Using a New Experimental Device" for the 2019 OTA Annual Meeting, September 25-29, 2019 in Denver, Colorado

108. Dunn JA, Magit D, Guertin L, Michaud MD, **Troy KL**. Design of a Wearable Sensor System for Prevention of Fatigue Induced Injuries in Baseball Pitching. ASME International Mechanical Engineering Congress and Expo, Salt Lake City, UT. Nov 8-14, 2019 **WINNER 3rd Place, Undergraduate research and design expo student poster competition*

109. Lubitz M, Garas P, **Troy KL**, Magit D. Measuring dynamic elbow UCL strain with high density mapping: a biomechanical study. Annual meeting of the Orthopaedic Research Society, Feb 7-11, 2020 Phoenix, AZ *(finalist for Preclinical Models Section award)*

110. Mancuso ME, Distefano M, **Troy KL**. Bone Strain Distribution, Not Magnitude, is Affected by Execution of a Forearm Loading Task. Accepted for presentation at the 2020 Annual meeting of the American Society of Biomechanics, August 4-7, 2020 *(presentation format TBD)*

111. Murdock KE, Tenforde AS, Davis IS, **Troy KL.** Bone Architecture and Foot Muscle Strength are not Different in Healthy Male Versus Female Runners. Accepted for presentation at the 2020 Annual meeting of the American Society of Biomechanics, August 4-7, 2020 *(presentation format TBD)*

112. Pinette MP, Nguyen N, Battaglino RA, Morse LR, **Troy KL**. Exoskeleton-assisted walking therapy increases muscle volume in people with spinal cord injury (SCI). Accepted for presentation at the 2020 Annual meeting of the American Society of Biomechanics, August 4-7, 2020 *(presentation format TBD)*

113. Mattson NE, Morse LR, Nguyen N, **Troy KL**. Analysis of gait biomechanics in people with chronic spinal cord injuries during exoskeleton walking therapy using video footage. Submitted to: American Spinal Injury Association Annual Meeting 2021. *(in review)*

114. Mancuso ME, DiStefano MS, Troy KL. Simulation of strain-driven trabecular bone adaptation to compressive forearm loading in humans. Submitted to: Annual Meeting of the Orthopaedic Research Society, 2021. *(in review)*

115. Lewis M, DeLuca S, Wu AC, Ackerman KE, Rauh MJ, Heiderscheit B, Krabak BJ, Roberts W, **Troy K,** Kraus E, Barrack MT, Tenforde AS. Anatomic Distribution of Bone Stress Injuries in Middle School Runners. Poster presented at: 2020 New England Chapter of the American College of Sports Medicine Annual Fall Virtual Conference; October 2020.

116. DeLuca S, Wu AC, Ackerman KE, Lewis M, Rauh MJ, Heiderscheit B, Krabak BJ, Roberts W, Kraus E, **Troy K**, Barrack MT, Tenforde AS. Risk Factors Associated with Bone Stress Injury in Middle School Runners. Poster presented at: 2020 New England Chapter of the American College of Sports Medicine Annual Fall Virtual Conference; October 2020.

117. Mazur CM, Edwards WB, Haider IT, Fang Y, Morse LR, Schnitzer TJ, Simonian N, **Troy KL**. Sex-specific differences in bone mass are maintained following spinal cord injury. American Society for Bone and Mineral Research Annual Meeting. September 11-14, 2020 (poster presentation)

118. Lincoln SE, Nguyen N, Mattson NE, **Troy KL**, Morse LR, Battaglino R. MicroRNA-148a-3p is a Candidate Mediator in the Increase in Bone Marrow Adiposity and Loss of Bone Mass Following Spinal Cord Injury. Submitted to: 2021 Annual meeting of the American Academy of Physiatry

119. DeLuca S, Tenforde A, Wu AC, Ackerman K, Lewis M, Rauh MJ, Heiderscheit B, Krabak B, Roberts DO, Barrack M, Kraus E, **Troy KL**. Prevalence, Anatomic Distribution, and Risk Factors Associated with Bone Stress Injury in Middle School Runners. Submitted to: 2021 Annual meeting of the American Academy of Physiatry

INVENTIONS AND PATENTS

"Systems and Methods for Early Detection of Fracture Healing", PCT International Patent Application No. PCT/US2018/028251 Based in U.S. Provisional Patent Application No.: 62/487,190, filed: April 19, 2018 (issued)

LANGUAGES

English (native)
German (good reading, some writing, good conversational)
French (some reading, some writing, limited conversational)

REVIEWING

Journals: ASME Journal of Biomechanical Engineering, Experimental Gerontology, Ergonomics, Journal of Applied Biomechanics, Journal of Biomechanics, Journal of Bone and Joint Surgery, Journal of the Mechanical Behavior of Biomedical Materials, Journal of Neuroengineering and Rehabilitation, Journal of Sports Science, Clinical Biomechanics, Human Factors, Human Factors and Ergonomics, Human Movement Science, Medicine in Science, Sports and Exercise, PLoS One, Osteoporosis International, BMC Musculoskeletal Disorders, Bioinspired, Biomimetic, and Nanobiomaterials, WIREs Systems Biology and Medicine, Topics in Spinal Cord Injury Rehabilitation, Journal of Orthopaedic Research, Seminars in Arthritis and Rheumatism, Annals of Rheumatic Disease, Scientific Reports

Awards: American Society of Biomechanics reviewer for student Grant-In-Aid, Predoctoral Awards, Clinical Biomechanics, Journal of Biomechanics, and Microstrain Awards, Rehabilitation Engineering Society of North America Student Scientific Competition

Abstracts: Annual meetings of the Orthopaedic Research Society, American Society of Biomechanics

Grants:

Swiss National Science Foundation *(2018)*
National Science and Engineering Research Council of Canada (NSERC, *2015, 2016, 2017, 2018, 2020*),
Austrian Science Fund (2015),
NASA Musculoskeletal Alterations Panel *(ad hoc member, 2014)*,
NIH NIAMS AMS Review Panel *(ad hoc member, June 2015, February 2016, June 2017)*,
NIH NIAMS LRP Review Panel *(ad hoc member, July 2016, April 2017, March 2019)*,
NIH NIAMS AMS Conflict Review Panel *(ad hoc member, November, 2016, February 2017)*
NIH ZRG1 PSE-W-02 Review Panel *(ad hoc member, March 2018)*
NIH ZAR1 FY M1 Mechanistic Ancillary Studies *(ad hoc member, February 2020)*
NIH SBSR Review Panel (*ad hoc member, February 2019)*
NSF LEAP HI "Materials Behavior" *ad hoc reviewer, December 2019*
NSRDEC Review Panel *(June 2017)*
Veterans Affairs SPIRE grant review (April 2020)

POPULAR MEDIA HIGHLIGHTS

"Emu research could help fight Bo Jackson disorder" *Des Moines Register* [Associated Press] by Chuck Schoffner, May 25, 2001

Stiff, 2003, by Mary Roach. Page 137 *(dissertation work mentioned)*

"Slip and Fall", interview by Gionnifer Fields, broadcast on "Eight-forty-eight", *Chicago Public Radio WBEZ 91.5* February 16, 2005

"The cure for clumsiness?" broadcast on "The Daily Planet", *Discovery Channel Canada* April 4, 2005

"Falling Study is a Trip" by Julie Deardorff , *The Chicago Tribune*, *section 13 "Q"*, pg 7. June 12, 2005

"It's all in the wrist: AHS researcher creates 'virtual wrist' to study, prevent wrist fractures" *AHS Magazine* Fall/Winter 2005

"Slip science: Labs research how to prevent falls" by Malcolm Ritter, Associated Press. Published in USA-Today May 17, 2007 Section: Technology, Science & Space

"Slipping for Science" broadcast on ABC Nightly News *Healthbeat* section, Chicago, IL December 20, 2007

"The Science Behind Elderly Falling, Slipping: Researchers Study How The Elderly Fall in Order to Teach Them How to Fall Better" broadcast on Good Morning America May 13, 2009