

Exponent®
Engineering & Scientific Consulting

Marika Walker, Ph.D.

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Professional Profile

Dr. Walker's areas of expertise include biomechanical analysis of the spine and lower extremities in various sport movements as well as textile comfort, moisture management, and heat stress mitigation with personal protective equipment. Specifically, she has studied gait, jumping, drop-landing, throwing, cutting, and stair ascent as they relate to sport performance and/or the development of injury with athletes and clinical populations with or without the use of athletic equipment.

Dr. Walker has investigated the effects of multiple rib protector garments from large sports equipment companies on the performance and spinal mobility of quarterbacks while completing an overhand football pass. Additionally, she has evaluated methodologies used to quantify fabric- and garment-level effects on heat stress and has collected and interpreted data with these measures for various protective and/or athletic garments. She has consulted for several sport technology and equipment companies in various phases of research and development of their products.

Her biomechanical research studies have included the use of motion capture, force plates, electromyography, and dynamometry technology to assess movements. Additionally, she has utilized several moisture management, dry heat transfer, and evaporative resistance measurement systems, including instrumented manikins and physiological wear trials to assess the effects of various textile configurations in government, military, and athletic applications.

As a former athlete, personal trainer, corrective exercise specialist, and performance enhancement specialist, Dr. Walker is able to use a multifaceted approach, in conjunction with her research expertise, to assist clients with evaluating questions related to evaluating human performance and product development.

Academic Credentials & Professional Honors

Ph.D., Kinesiology, University of Georgia, 2017

M.S., Textile Engineering, North Carolina State University, 2013

B.S., Textile Engineering, North Carolina State University, 2011

Tau Beta Pi

New Investigator Award, 1st Place Poster Presentation, International Society of Biomechanics in Sports, 2017

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Licenses and Certifications

NASM Corrective Exercise Specialist

National Academy of Sports Medicine - Home Gym Design Certificate

NASM Performance Enhancement Specialist

National Academy of Sports Medicine - Youth Exercise Specialist Certificate (YES)

Red Cross - CPR/AED Certificate

Prior Experience

Founder and CEO, ADEPT Movement Academy, 2019-CURRENT

Project Manager and Energy Efficiency Processor, ADMT Green Technology, 2017-2020

Publications

Li Y, Ko J, Walker MA, Brown CN, Simpson KJ. Joint coordination and stiffness during landing in individuals with chronic ankle instability. Journal of Applied Biomechanics 2020.

Walker MA, Li Y, Samson CO, Foutz T, Simpson KJ, Brown CN. Differences in trunk range of motion for various flexibility protocol types, particularly in quarterbacks wearing rib protectors. Sports Orthopaedics and Traumatology 2020. https://doi.org/10.1016/j.orthr.2020.11.001

Walker MA, Li Y, Samson CO, Foutz T, Simpson KJ, Brown CN. The effect of rib protector garments on trunk kinematics, performance, and perceptions of quarterbacks during an overhand American football throw. International Journal of Sports Science 2020; 10(1):23-29. https://doi.org/10.5923/j.sports.20201001.04

Li Y, Kakar RS, Fu Y, Walker M, Brown CN, Oswald TS, Simpson KJ. Postural control of individuals with spinal fusion for adolescent idiopathic scoliosis. Clinical Biomechanics 2019; 61:46-51. https://doi.org/10.1016/j.clinbiomech.2018.11.001

Li Y, Kakar RS, Walker M, Guan L, Simpson KJ. Upper trunk – pelvis coordination during running using the continuous relative Fourier phase method. Journal of Applied Biomechanics 2018; 34(4): 312-319. https://doi.org/10.1123/jab.2017-0250

Li Y, Ko J, Walker M, Brown C, Schmidt J, Kim S, Simpson, K. Does chronic ankle instability influence knee biomechanics of females during inverted surface landings? International Journal of Sports Medicine 2018; 39(13): 1009-1017. https://doi.org/10.1055/s-0044-102130

Li Y, Ko J, Walker MA, Brown CN, Schmidt JD, Kim S-H, Simpson KJ. Does chronic ankle instability influence lower extremity muscle activation of females during landing? Journal of Electromyography and Kinesiology 2018; 38: 81-87. https://doi.org/10.1016/j.jelekin.2017.11.009

Li Y, Kakar RS, Walker MA, Fu Y-C, Oswald TS, Brown CN, Simpson KJ. Intra-trunk coordination exhibited during treadmill running by individuals with spinal fusion for adolescent idiopathic scoliosis. Journal of Applied Biomechanics 2017; 33(6): 437-445. https://doi.org/10.1123/jab.2017-0085

DenHartog EA, Walker MA, & Barker RL. Total heat loss as a predictor of physiological response in wildland firefighter gear. Textile Research Journal 2015; 86(7): 710-726.

https://doi.org/10.1177/0040517515596926

Presentations

Walker, M., Simpson, K., & Samson, C. (2017). The throwing performance and trunk kinematics of quarterbacks during a football throw while wearing rib protector garments. Proceedings of the 35th International Conference on Biomechanics in Sports, International Society of Biomechanics in Sports.

Walker, M., Simpson, K., Dolgetta, J., Raiford, J., & Samson, C. (2017). Perceived and Actual Throwing Performances of Quarterbacks While Wearing Rib Protector Garments. Proceedings of the 64th Annual Meeting of the American College of Sports Medicine, American College of Sports Medicine.

Walker, M., Barker, R., & Ross, K. (2014). An Analysis of the Test Methods in Measuring Heat Stress as they Relate to Wildland Firefighting Clothing. Proceedings of the Annual Meeting of the Southeast Chapter of the American College of Sports Medicine, Southeast Chapter of the American College of Sports Medicine.

Walker, M., Barker, R., & Ross, K. (2013). From Sweating Plates to Manikins: Evaluating the Role of Clothing Materials in Reducing the Risk of Heat Stress in Wildland Firefighting. Proceedings of the International Association of Wildland Fire 4th Fire Behavior and Fuels Conference.

Peer Reviews

Textile Research Journal