Exponent®
Engineering & Scientific Consulting

Lizzie Walker, Ph.D.
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Professional Profile

Dr. Walker specializes in orthopaedic biomechanics with an emphasis in soft tissue biomechanics. She utilizes her past academic research experience to provide in-depth assessments of biomechanical issues that require a thorough understanding of soft tissue structure-function relationships. She evaluates human movement, injury mechanics, and injury potential in a variety of settings including during motor vehicle, workplace, and recreational incidents.

Dr. Walker has a wide range of experience in various research methods including tensile and compressive mechanical testing, scanning electron microscopy (SEM)/energy dispersive x-ray spectroscopy (EDS), clinical imaging, and motion capture. Dr. Walker has published in peer reviewed journals and has presented at national conferences on these topics.

Prior to Exponent, Dr. Walker conducted ex vivo human cadaver experiments to study the pathomechanics of trapeziometacarpal osteoarthritis. Her research utilized a variety of mechanical testing procedures (stress relaxation, load to failure, microindentation) and imaging modalities (X-ray, CT, MRI, SEM/EDS, multiphoton) to study the impact of osteoarthritis on structure-function relationships of surrounding soft tissues, including ligaments and articular cartilage. From this research, she was able to draw a correlation between an attenuating volar ligament complex and articular cartilage deterioration within the joint as osteoarthritis progressed. She also served as lab manager for the Clemson-Medical University of South Carolina Orthopaedic Bioengineering Lab and as a teaching assistant for Structural Biomechanics.

Academic Credentials & Professional Honors

Ph.D., Bioengineering, Clemson University, 2025

B.S., Biomedical Engineering, Mississippi State University, 2020

Prior Experience

Graduate Research Assistant, Clemson University, 2020-2025

Laboratory Manager, Clemson University, 2020-2025

Teaching Assistant: Structural Biomechanics, Clemson University, 2023

Professional Affiliations

Orthopaedic Research Society, 2020-present

American Society of Biomechanics, 2025-present

Publications

Walker L, Li H, Buchweitz N, Gordon D, Wang S, Daley D, Yao H, Wu Y. A regional mapping of articular cartilage integrity and biphasic properties in healthy and osteoarthritic trapeziometacarpal joints. Annals of Biomedical Engineering 2025; 53(6):1471–1485.

Walker L, Gordon D, Chiaramonti A, Wang S, Meng Z, Daley D, Slate E, Yao H, Pellegrini VD, Wu Y. Morphological and mechanical property differences in trapeziometacarpal ligaments of healthy and osteoarthritic female joints. Annals of Biomedical Engineering 2025; 53:812.

DiNicola ES, Martinez AV, Walker L, Wu Y, Burnikel BG, Mercuri J. Cigarette smoke extract exacerbates progression of osteoarthritic-like changes in cartilage explant cultures. Journal of Orthopaedic Research 2024; 42:1682–1695.

Presentations

Walker L, Gordon D, Kelley J, Mukherji M, Zhang R, Daley D, Meng Z, Pellegrini VD, Ye T, Yao H, Wu Y. Beak ligament microarchitecture deteriorates at metacarpal enthesis in female osteoarthritic trapeziometacarpal joints. Poster presentation, Orthopaedic Research Society Annual Meeting, Phoenix, AZ, 2025.

Walker L, Gordon D, Wang S, Mah E, Daley D, Yao H, Wu Y. A mapping of articular cartilage integrity and biphasic properties in healthy and osteoarthritic trapeziometacarpal joints. Podium presentation, Orthopaedic Research Society Annual Meeting, Long Beach, CA. 2024.

Gordon D, Walker L, Sun S, Baek J, Chiaramonti A, Mah E, Wolfe J, Daley D, Yao H, Wu Y. Impact of ligament integrity on the stability of trapeziometacarpal joint kinematics. Poster presentation, Orthopaedic Research Society Annual Meeting, Long Beach, CA, 2024.

Walker L, Gordon D, Chiaramonti A, Daley D, Yao H, Wu Y. Comparison of viscoelastic ligament properties in healthy and osteoarthritic trapeziometacarpal joints. Podium presentation, Orthopaedic Research Society Annual Meeting, Dallas, TX, 2023.

Walker L, Sun S, Gordon D, Bain N, Chiaramonti A, Nadeau E, Daley D, Yao H, Wu Y. Kinematic analysis of functional motions in healthy and osteoarthritic human TMC joints: an optical motion tracking approach. Poster presentation, Orthopaedic Research Society Annual Meeting, Tampa, FL, 2022.

Peer Reviews

Journal of Biomechanical Engineering