Exponent®
Engineering & Scientific Consulting

Dhara Amin, Ph.D.

Senior Managing Engineer | Biomechanics
Philadelphia
+1-215-594-8894 | damin@exponent.com

Professional Profile

Dr. Amin offers an expertise in injury biomechanics and tissue biomechanics, specializing in analyzing the injury mechanisms associated with the spine as a result of occupational accidents. She has a background in both biomedical and mechanical engineering.

Dr. Amin has conducted a variety of research involving cervical and lumbar spine injuries resulting from occupational overuse. She has additional research experience that focused on understanding the failure mechanics of human joints and orthopedic implants. At Exponent, Dr. Amin evaluates the mechanics and risks of injury in motor vehicle, occupational, and recreational accidents.

Prior to joining Exponent, Dr. Amin worked as a research engineer at Globus Medical Inc., developing and conducting research studies that investigated the mechanics of orthopedic implants for product development, clinical understanding, and regulatory approvals. Dr. Amin's doctoral work focused on understanding the effects of repetitive lifting on intervertebral disc injury and the mechanisms for lumbar disc herniation. During her graduate studies, Dr. Amin conducted six degree of freedom mechanical testing on human joints (spine, knee, hip, ankle, and wrist) and orthopedic implants to understand failure patterns. Dr. Amin's doctoral work broadened her science communication experience, filming television segments, competing in various presentation competitions, and receiving formal media training. Dr. Amin completed a Whitaker International fellowship at Flinders University in Australia, which focused on the structural properties of intervertebral discs and the effects of disc degeneration.

Academic Credentials & Professional Honors

Ph.D., Biomedical Engineering, Flinders University, 2019

B.S., Mechanical Engineering, University of Delaware, 2013

Whitaker International Fellow, Flinders University 2013-2014

Spine Research Award– Spine Society of Australia, 2019

IET Present Around the World, 1st Place, Australia, 2018

Tau Beta Pi Honor Society

Licenses and Certifications

Professional Engineer Mechanical, Delaware, #30486

Academic Appointments

Lecturer, Engineering, Flinders University, 2017-2019

Prior Experience

Research Engineer, Globus Medical Inc., 2019 - 2020

Research Engineer, Medical Device Partnering Program, Flinders University, 2016-2018

Professional Affiliations

Society of Women Engineers

Engineers without Borders

Publications

Amin DB, Tavakoli J, Freeman, BJC, Costi JJ. Mechanisms of failure following simulated repetitive lifting: A clinically relevant biomechanical cadaver study. Spine 2020; 15;45(6):357-367.

Whitmarsh SK, Amin DB, Costi JJ, Denis JD, Huveneers C. Effectiveness of novel fabrics to resist punctures and lacerations from white shark: Implications to reduce injuries from shark bites. PloS One 2019; 14;14(11):e0224432.

Amin DB, Moawad CM, Costi JJ. New findings confirm regional internal disc strain changes during simulation of repetitive lifting motions. Annals of Biomedical Engineering, 2019; 47(6):1378-1390.

Lamberto G, Amin DB, Solomon LB, Ding B, Reynolds KJ, Mazza C, Martelli S. Personalised 3D knee compliance from clinically viable knee laxity measurements: A proof of concept ex vivo experiment. Medical Engineering & Physics 2018; 64:80-85.

Tavakoli J, Amin DB, Freeman BJC, Costi JJ. The Biomechanics of Inter-Lamellar Matrix and the Lamellae During Progression to Lumbar Disc Herniation: Which is the Weakest Structure? Annals of Biomedical Engineering 2018; 46(9):1280-1291.

Holsgrove TP, Amin DB, Pascual SR, Ding B, Welch WC, Gheduzzi S, Miles AW, Winkelstein BA, Costi JJ. The equivalence of multi-axis spine systems: Recommended stiffness limits using a standardised testing protocol. Journal of Biomechanics, 2017; 70:59-66.

Amin DB, Lawless I, Sommerfeld D, Ding B, Stanley R, Costi J. The Effect of Six Degree of Freedom Loading on in-vitro Compressive Recovery Properties of Human Lumbar Spine Segments. Journal of Biomechanics. 2016; 49(14):3407-3414.

Amin DB, Sommerfeld D, Lawless IM, Stanley RM, Ding B, Costi JJ. Effect of Degeneration on the Six Degree of Freedom Mechanical Properties of Human Lumbar Spine Segments. Journal of Orthopaedic Research, 2016; 34(8):1399-409.

Amin D, Lawless I, Sommerfeld D, Ding B, Stanley R, Costi J. Effect of Potting Technique on the Six Degree of Freedom Viscoelastic Properties of Human Lumbar Spine Segments. Journal of Biomechanical Engineering 2015; 137(5):054501.

Presentations

Amin DB, Tavakoli J, Freeman, BJC, Costi JJ. Mechanisms of failure following simulated repetitive lifting:

a clinically relevant biomechanics cadaveric study. Oral Presentation, Spine Society of Australia Annual Meeting, Gold Coast, Australia. 2019.

Amin DB, Moawad CM, Costi JJ. Analysis of Internal Disc Strains during simulation of repetitive lifting motions. Oral Presentation, Australian and New Zealand Orthopaedic Research Society Annual Scientific Meeting, Perth, Australia, 2018.

Amin DB, Moawad CM, Costi JJ. Multiaxial lumbar intervertebral disc mechanics are altered after simulated repetitive lifting movements. Oral Presentation. Australian and New Zealand Orthopaedic Research Society Annual Scientific Meeting, Perth, Australia, 2018.

Amin D, Moawad C, Costi J. Analysis of Internal Disc Strains and Injury during Simulation of Repetitive Lifting Motions. Oral Presentation. International Society of the Study of Lumbar Spine Conference, Banff, Canada, 2018.

Amin D, Moawad C, Costi J. Analysis of Internal Disc Strains and Injury during Simulation of Repetitive Lifting Motions. Poster Presentation. Spine Society of Australia Annual Meeting, Adelaide, Australia, 2018.

Amin D, Moawad C, Stanley R, Ding B, Costi J. Three-Dimensional Lumbar Intervertebral Disc Internal Strains During Combined Repetitive Loading. Oral Presentation. Spine Society of Australia Annual Meeting, Hobart, Australia, 2017.

Amin D, Lawless I, Sommerfeld D, Stanley R, Ding B, Costi J. The Effect of Degeneration on Six Degree of Freedom Mechanical Properties of Human Spine Segments. Oral Presentation. Spine Society of Australia Annual Meeting, Melbourne, Australia. 2016.

Amin D, Lawless I, Sommerfeld D, Stanley R, Ding B, Costi J. The Effect of Degeneration on Six Degree of Freedom Mechanical Properties of Human Spine Segments. Poster Presentation Orthopedic Research Society, Orlando, FL. 2016.

Peer Reviews

Spine (Phila Pa 1976)