

Tara L.A. Moore, PhD, PE
Managing Engineer, Philadelphia Office

Dr. Tara Moore is a Managing Engineer at JP Research, with extensive experience applying her medical and technical knowledge to solve real-world problems. A biomechanical engineer with a Ph.D. in Medical Engineering (from Harvard University-Massachusetts Institute of Technology) and an M.S. in Mechanical Engineering (from MIT), Dr. Moore has over 15 years' research and accident reconstruction experience in the area of human injury / tolerance to mechanical load, especially bone fracture tolerance. She specializes in performing biomechanics accident reconstructions to address issues involving human injury biomechanics, using case-specific information, engineering principles and information from the scientific and biomechanical literature to determine the severity and mechanism of injuries occurring in transportation, occupational, and industrial accidents; injuries occurring in falls; and injuries to children.

For JP Research, Dr. Moore heads the company's Philadelphia office. In this role, she applies her strong medical and engineering background in injury accident reconstruction and analysis, as well as her management experience in business development and project management. Her background includes evaluating diverse events, from automotive collisions to falls, to assess whether the motions, accelerations, and loads caused injury, and she has performed biomechanical reconstructions of incidents involving industrial equipment, including forklifts and industrial lifts, to determine how traumatic injuries occurred.

Formerly a managing engineer with Exponent/Failure Analysis Associates and a private engineering consultant through her own consulting business, Dr. Moore's previous consulting experience includes analyses and reconstructions of motor vehicle crashes, occupational injuries, and falls. She has evaluated biomechanical issues and injury potential associated with alternate scenarios, such as changes in design or safety equipment, and has used biomechanical analyses to evaluate whether a described scenario could have occurred during a fall, burn, motor vehicle collision, or other event. Dr. Moore's research interests include applying field accident data to understand biomechanical issues in rollovers, pediatric inertial neck injuries in motor vehicle collisions, balance retention while operating material handling equipment, traumatic injury in the presence of implanted medical devices, and the effect of occupant size (height, weight, BMI) on injury risk. She has also performed research studies of trabecular bone mechanics, mechanics of cellular materials, materials systems for rapid prototyping, and fatigue of materials.

Dr. Moore is a licensed professional engineer in Pennsylvania.

Education, Memberships, and Professional Honors

Harvard University-Massachusetts Institute of Technology, Division of Health Sciences and Technology	Ph.D., Medical Engineering	2001
Massachusetts Institute of Technology	M.S., Mechanical Engineering	1996
Carleton University, Canada	B.Eng., Aerospace Engineering (with High Distinction)	1994

SAE Vehicle Accident Reconstruction Methods 2008
Northwestern University Center for Public Safety, Traffic Accident Reconstruction 1 2009

Licenses and Certifications

Licensed Professional Engineer, Pennsylvania, #PE074306

Honors and Awards

Natural Sciences and Engineering Research Council of Canada 1967 Fellow
Alberta Heritage Fund Sir James Lougheed Award of Distinction
National Research Council of Canada Women in Science and Engineering Trainee
C.D. Howe Memorial Foundation Engineering Award
Natural Sciences and Engineering Research Council of Canada Targeted Women's University
Undergraduate Student Researcher
Canada Scholar

Memberships and Professional Affiliations

American Society of Mechanical Engineers (member)
Society of Automotive Engineers (member)
American Society of Biomechanics (member)
Association for the Advancement of Automotive Medicine (member)

Professional Experience

JP Research, Inc., Philadelphia, Pennsylvania

Managing Engineer, Philadelphia Office, 2015–Present

Manages and provides technical support for research and litigation projects through the Philadelphia office as well as support to other JP Research projects and offices. Project experience and expertise includes biomechanical accident reconstruction of falls, industrial incidents, and motor vehicle crashes, including frontal collisions, rear-end impacts, lateral collisions, rollovers, collisions involving child restraints, and collisions involving pregnant occupants, to determine occupant kinematics, contacts, and mechanism of injuries. Management responsibilities include providing bioengineering expertise and program oversight at every level.

Singapore University of Technology and Design, Singapore

Senior Manager, Industry Development, 2014–2015

Responsible for developing and fostering relationships between the Engineering Product Development (EPD) pillar of and external partners, including industry, research, non-profit, and government organizations. Developed research programs and created resources to showcase the unique value proposition of this startup university (established in collaboration with MIT). Also served as a course advisor in aerodynamics.

Innogene Kalbiotech Pte Ltd, Singapore

Consultant, 2014

Consulted on project management issues. Developed project management training plan and advised staff on project management techniques.

Tara Moore Consulting, Philadelphia, Pennsylvania

President, 2010–2015

Consulted on biomechanics of injury for a variety of clients. Performed biomechanics, occupant kinematics, and accident reconstruction investigations. Advised clients on technical issues for legal claims. Presented highly complex scientific and medical information to technical and non-technical audiences. Developed and maintained client relationships and increased revenues.

Exponent, Inc., Philadelphia, Pennsylvania

Managing Engineer, 2001–2010

Responsible for biomechanical analysis and reconstruction of events leading to human injury in diverse events such as falls, motor vehicle collisions, and incidents involving industrial equipment. Efforts included evaluation of safety equipment and alternate accident and safety scenarios. Managed staff, led project teams and managed projects for biomechanics and occupant kinematics investigations. Applied engineering and physics principles to evaluate injury mechanisms in traumatic events and to reconstruct accidents. Communicated technical issues needed to make business and legal decisions to decisionmakers. Created and executed cross-disciplinary research programs that expanded business capabilities and offerings and developed an independent client base. Qualified as an expert in US courts.

Beth Israel Deaconess Medical Center

(Harvard Medical School), Boston, Massachusetts

Research Assistant, 1996-2001

Research assistant in the Orthopaedic Biomechanics Lab, Beth Israel Deaconess Medical Center, a teaching hospital of Harvard Medical School.

Massachusetts Institute of Technology, Cambridge, Massachusetts

Research Assistant, 1996-2001

Research assistant in the Cellular Solids Lab, Department of Materials Science and Engineering, MIT.

Massachusetts Institute of Technology, Cambridge, Massachusetts

Research Assistant, 1994-1996

Research assistant in the Three Dimensional Printing Lab, Lab for Manufacturing and Productivity, Department of Mechanical Engineering, MIT.

Teaching Experience / Academic Appointments

Guest Lecturer –

Princeton University, Princeton, New Jersey

Drexel University, Philadelphia, Pennsylvania

Temple University, Philadelphia, Pennsylvania

Course Advisor –

Singapore University of Technology and Design,

Engineering Product Development (Aerodynamics)

Adjunct Professor –

Temple University, Department of Mechanical Engineering

Visiting Lecturer –

Princeton University, Department of Mechanical and Aerospace Engineering

Relevant Volunteer Experience

Peer Review

Reviewer, 2006-2013

Performed peer reviews of manuscripts submitted for presentation/ and publication at various prestigious conferences:

SAE World Congress, 2006–2013

SAE Commercial Vehicle Engineering Congress, 2011

American Society of Biomechanics Annual Conference, 2007

ASME Summer Bioengineering Conference, 2008-2010

ASME International Mechanical Engineering Congress and Exposition (IMECE), 2008

Selected Presentations and Publications

Published Papers

“Accidental falls involving medical implant re-operation,” *Injury* 2009; 40: 1088-1092. (Ong K, Lau E, **Moore TLA**, Heller M)

“Inertially-induced cervical spine injuries in the pediatric population,” SAE World Congress, SAE 2009-01-0395, Detroit, MI, April 20-23, 2009. (**Moore T**, Prange MT, Corrigan CF)

“Police accident report restraint usage accuracy and injury severity,” SAE World Congress, SAE 2009-01-1253, Detroit, MI, April 20-23, 2009. (**Moore T**, Ray R, Raasch C, Huang S, Corrigan CF)

“Occupant injury in motor vehicle collisions: using field accident data,” SAE World Congress, SAE 2009-01-0394, Detroit, MI, April 20-23, 2009. (**Moore TLA**, Fisher JL, Heller M, Lau E, Watson H, Ong K)

“Measurements of non-injurious head accelerations of a pediatric population,” SAE World Congress, SAE 2009-01-0383, Detroit, MI, April 20-23, 2009. (Bussone W, **Moore TLA**, Richards D, Bove R, Scher I, Prange M)

“Inertial neck injuries in children involved in frontal collisions,” SAE World Congress, SAE 2007-01-1170, Detroit, MI, April 16–19, 2007. (Prange MT, Newberry WN, **Moore TLA**, Peterson D, Smyth B, Corrigan CF)

“Rollover severity and occupant protection: A review of NASS/CDS Data,” SAE World Congress, SAE 2007-01-0676, Detroit, MI, April 16–19, 2007. (Parker D, Ray R, **Moore TLA**, Keefer RE)

“Timing of head-to-vehicle perimeter contacts in rollovers,” SAE World Congress, SAE 2007-01-0370, Detroit, MI, April 16–19, 2007. (Gloeckner DC, Bove RT, Croteau J, Corrigan CF, **Moore TLA**)

- “Theoretical analysis of a method of computing dynamic roof crush during rollovers,” *Transactions of the Society of Automotive Engineers*, SAE 2007-01-0366, 2007. (Yamaguchi G, Ashby B, Luepke P, **Moore TLA**, Bove RT, Corrigan CF)
- “Implications of vehicle roll direction on occupant ejection and injury risk,” Association for the Advancement of Automotive Medicine, 50th Annual Scientific Conference, Chicago, IL, October 15–18, 2006. (Gloeckner C, **Moore TLA**, Steffey D, Le-Resnick H, Bare C, Corrigan CF)
- “The effects of anthropometry on driver position and clearance measures,” SAE World Congress, SAE 2006-01-0454, Detroit, MI, April 3–6, 2006. (Bove RT, Fisher JL, Ciccarelli L, Cargill RS, **Moore TLA**)
- “Postural stability of stand-up forklift operators in response to normal braking procedures,” ASME International Mechanical Engineering Congress and Exposition, Orlando, FL, November 5–11, 2005. (Mkandawire C, Nicosia MA, **Moore TLA**, Corrigan CF)
- “Biomechanical factors and injury risk in high-severity rollovers,” *49th Annual Proceedings of the Association for the Advancement of Automotive Medicine*, pp. 133–150, 2005. (**Moore TLA**, Vijayakumar V, Steffey DL, Ramachandran K, Corrigan CF)
- “Creep does not contribute to fatigue in bovine trabecular bone,” *Journal of Biomechanical Engineering*, 2004; 126:321–329. (**Moore TLA**, O’Brien FJ, Gibson LJ)
- “A phenomenological model for predicting fatigue life in bovine trabecular bone,” *Journal of Biomechanical Engineering*, 2004; 126:330–339. (Ganguly P, **Moore TLA**, Gibson LJ)
- “Fatigue microdamage in bovine trabecular bone,” *Journal of Biomechanical Engineering*, 2003; 125:761–768. (**Moore TLA**, Gibson LJ)
- “Fatigue of bovine trabecular bone,” *Journal of Biomechanical Engineering*, 2003; 125:769–776. (**Moore TLA**, Gibson LJ)
- “Microdamage accumulation in bovine trabecular bone in uniaxial compression,” *Journal of Biomechanical Engineering*, 2002; 124:63–71. (**Moore TLA**, Gibson LJ)
- “Modeling microdamage accumulation in bovine trabecular bone in uniaxial compression,” *Journal of Biomechanical Engineering*, 2001; 123:613–622. (**Moore TLA**, Gibson LJ)
- “Sequential labeling of microdamage in bone using chelating agents,” *Journal of Orthopaedic Research*, 2000; 18:322–32. (Lee TC, **Arthur TL**, Gibson LJ, Hayes WC)

Theses, Presentations and Published Abstracts

- “Microdamage accumulation in bovine trabecular bone,” Ph.D. Thesis, Harvard-MIT Division of Health Sciences and Technology, Massachusetts Institute of Technology, 2001. (**Moore TLA**)
- “Factors limiting the surface finish of three dimensional printed parts,” S.M. Thesis, Massachusetts Institute of Technology, 1996. (**Arthur TL**)
- “Lumbar spine loads in low- and moderate-speed rear-end collisions,” *Proceedings*, ASME 2008 Summer Bioengineering Conference, Marco Island, FL, 2008. (Fisher J, Bove RT, **Moore TLA**)
- “Using injury tolerance data to reconstruct accidents,” *Proceedings*, ASME 2008 Summer Bioengineering Conference, Marco Island, FL, 2008. (**Moore TLA**, Bove RT)
- “Inertial neck injuries in children involved in frontal collisions: Sled testing using the 6-Year-old ATD,” *Proceedings*, ASME 2007 Summer Bioengineering Conference, Keystone, CO, 2007. (**Moore TLA**, Prange MT, Newberry W, Peterson D, Smyth B, Corrigan C)

- “Characterization of occupant anthropometry and clearance measures in passenger cars,” Joint Statistical Meetings, Seattle, WA, August 6–10, 2006. (Steffey DL, Bove RT, Fisher JL, Ciccarelli L, Cargill RS, **Moore TLA**)
- “Late-phase occupant rebound after rear-end impact,” *Proceedings*, Summer Bioengineering Conference, Abstract 188080, Vail, CO, June 22–26, 2005. (Fisher JL, Newberry WN, Krishnan R, Pierce J, **Moore TLA**)
- “Analysis of fatigue damage in bovine trabecular bone,” American Society of Biomechanics Annual Meeting, September 8–11, 2004. (Ganguly P, **Moore TLA**, Gibson LJ)
- “Endurance limit for bovine trabecular bone,” *Transactions of the 50th Annual Meeting of the Orthopedic Research Society*, Vol. 29, p. 34, 2004. (Hastings A, Gibson LJ, **Moore TLA**, Cheng DW, Guo XE)
- “Creep does not contribute to fatigue in bovine trabecular bone,” *Transactions of the 50th Annual Meeting of the Orthopedic Research Society*, Vol. 29, p. 36, 2004. (**Moore TLA**, O’Brien FJ, Gibson LJ)
- “The effect of number of cycles on microdamage accumulation in bovine trabecular bone,” *Proceedings*, ASME International Mechanical Engineering Congress and Exhibition, IMECE2001/BED-23026, 2001. (**Moore TLA**, Gibson LJ)
- “An endurance limits exists for compressive fatigue of bovine trabecular bone,” *Annals of Biomedical Engineering*, 2001; 29:S-34. (**Moore TLA**, Gibson LJ)
- “Microdamage accumulation during compressive fatigue of bovine trabecular bone,” *Proceedings*, ASME Bioengineering Conference, pp. 291–292, 2001. (**Moore TLA**, Gibson LJ)
- “Microdamage accumulation in trabecular bone in compression,” *Proceedings*, 12th Conference of the European Society of Biomechanics, p. 40, 2000. (**Arthur TL**, Gibson LJ)
- “Prediction of stiffness reduction using microdamage parameters in bovine trabecular bone,” *Proceedings*, 12th Conference of the European Society of Biomechanics, p. 334, 2000. (**Arthur TL**, Gibson LJ)
- “Microdamage in creep and monotonic compression of bovine trabecular bone,” *Transactions*, 46th Annual Meeting of the Orthopaedic Research Society, Vol. 25, p.736, 2000. (**Arthur TL**, Pierce RK, Gibson LJ)
- “Accumulation of microdamage with increasing strain in bovine trabecular bone,” *Advances in Bioengineering*, 1998; 335–336. (**Arthur TL**, Gibson LJ)
- “Specific labelling of fatigue damage in bone using fluorescent chelating agents,” *Irish Journal of Medical Science*, 1998; 167:117. (Lee TC, **Arthur TL**, Gibson LJ, Myers ER, Hayes WC)
- “Detection of fatigue crack growth in bone,” *Proceedings*, ASME Bioengineering Conference, pp. 309–310, 1997. (Lee TC, **Arthur TL**, Hayes WC, Gibson LJ)