

# CURRICULUM VITAE

## JACK TIGH DENNERLEIN

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### EDUCATION:

1986	Mechanical Engineering	B.S.	State University of New York	Buffalo, NY
1989	Mechanical Engineering	S.M.	M.I.T.	Cambridge, MA
1989	Advance Course in Engineering		General Electric	Lynn, MA
1996	Mechanical Engineering	Ph.D.	University of California	Berkeley, CA

### POST-DOCTORAL TRAINING

1997-1998	Mechanical Engineering	Harvard University	Cambridge, MA
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### ACADEMIC APPOINTMENTS

1999 - 2004	Assistant Professor of Ergonomics and Safety, Department of Environmental Health Harvard T.H. Chan School of Public Health	Boston, MA
2004 - 2010	Associate Professor of Ergonomics and Safety, Department of Environmental Health Harvard T.H. Chan School of Public Health	Boston, MA
2009 - 2014	Associate Professor of Orthopaedic Surgery, Brigham and Women's Hospital Harvard Medical School	Boston, MA
2010 - 2012	Senior Lecturer on Ergonomics and Safety, Department of Environmental Health Harvard T.H. Chan School of Public Health	Boston, MA
2012 -	Adjunct Professor of Ergonomics and Safety, Department of Environmental Health, Harvard T.H. Chan School of Public Health	Boston, MA
2012 -	Professor, Department of Physical Therapy, Movement, and Rehabilitation Sciences Bouvé College of Health Sciences, Northeastern University	Boston, MA

### OTHER PROFESSIONAL POSITIONS AND MAJOR VISITING APPOINTMENTS

1985	Engineering Assistant	West Valley Nuclear Service	West Valley, NY
1986 - 1991	Design Engineer	General Electric Aircraft Engines	Lynn, MA
1991 - 1996	Research Assistant	University of California	San Francisco, CA
2002 - 2007	Affiliated-Faculty	Biomechanics at Harvard, An NSF IGERT interdisciplinary Ph.D. program	Cambridge, MA
2004 - 2009	Faculty	Harvard T.H. Chan School of Public Health-Cyprus Program,	Boston, MA
2004 - 2005	Visiting Scientist	Human Movement Sciences,	

		VU University	Amsterdam, NL
1999 -	Affiliated Faculty	Harvard Injury Control Research Center	Boston, MA
2011 -	Full Member	DFCI/Harvard Cancer Center	Boston, MA
2012 -	Adjunct Scientist	VU Medical Center, EMGO+ Institute	Amsterdam, NL
2016 -	Affiliated Faculty	Department of Bioengineering, Northeastern University	Boston, MA

### AWARDS AND HONORS:

1985 - 1986	Zimmer Memorial Scholarship, SUNY at Buffalo
1985	Member Pi Tau Sigma, Mechanical Engineering honor society
1984	Member Tau Beta Pi, engineering honor society
1989	Associate member Sigma Xi, research honor society
1990 - 1991	GE Aircraft Engines Young Engineer Award Nomination
1998	Harvard University Derek Bok Distinction in Teaching Award
2000 - 2003	Whitaker Foundation Investigator Award
2003	Citation for Excellence in Teaching, Harvard T.H. Chan School of Public Health
2004 - 2005	Junior Faculty Sabbatical Award, Harvard T.H. Chan School of Public Health
2008	Occupational Medicine Residency Academic Teacher of the Year Award Harvard T.H. Chan School of Public Health
2008 - 2009	Juror, International Bicycle Design Competition, Taichung, Taiwan
2008 - 2013	Fulbright Specialist Roster in Public Health
2013	Occupational Medicine Residency Academic Teacher of the Year Award Harvard T.H. Chan School of Public Health
2013	Northeastern University Research Leadership Initiative Program
2015	Excellence in Teaching Citation, Executive and Continuing Professional Education Harvard T.H. Chan School of Public Health
2016	Elected Fellow, Human Factors and Ergonomics Society

### MAJOR PROFESSIONAL SERVICE:

#### National

2004	National Institute for Occupational Safety and Health Member Conflict Review Group (Ad hoc). Safety and Occupational Health (SOH) Study Section, U.S. Department of Health and Human Services
2004 - 2005	Center for Disease Control, Center for Injury Prevention and Control, Review Group (Biomechanics Study Section)
2004-2006	Member, ANSI/HFES 100-2007 Committee: <i>Human Factors Engineering for Computing Work Stations</i> .
2006 - 2010	Permanent Member, Safety and Occupational Health (SOH) Study Section, U.S. Department of Health and Human Services,
2009-	Consortium Member, Center for Construction Research and Training, Silver Springs MD
2011 -	Ad hoc reviewer, Safety and Occupational Health (SOH) Study Section, U.S. Department of Health and Human Services
2011 -	Advisory Board Member, Occupational Health Surveillance Program, Department of Public Health, Commonwealth of Massachusetts.
2012 - 2014	Hospital Ergonomics Task Force Member, Occupational Health Surveillance Program, Department of Public Health, Commonwealth of Massachusetts.
2013-2016	Project Panel Member, Transportation Research Board of the National Academies.
2014 -	Co-Scientific Director, Marconi Research Conferences of the Office Ergonomics Research Committee ( <a href="http://www.oerc.org">www.oerc.org</a> )

- 2015 FISH Workshop Steering Committee, *Fishing Partnership Support Services*, Burlington, MA
- 2015 - 2017 Hospital Ergonomics Stake-Holders Committee Member, Occupational Health Surveillance Program, Department of Public Health, Commonwealth of Massachusetts.
- 2017 - Member, Committee on Functional Assessment for Adults with Disabilities, National Academies of Sciences, Engineering, and Medicine, Health and Medicine Division,

#### International

- 2004 International Program Committee IASTED International Conference on Biomechanics
- 2004 -2007 Organizing Committee, Sixth International Scientific Conference on Prevention of Work-related Musculoskeletal Disorders, (PREMUS), Boston, MA 2007
- 2014-2016 International Scientific Committee, Ninth International Scientific Conference on Prevention of Work-related Musculoskeletal Disorders, (PREMUS), Toronto, Canada, 2016

#### PROFESSIONAL SOCIETIES:

- Member, Human Factors and Ergonomics Society (HFES)
- Member, American Society of Biomechanics (ASB)
- Associate Member, American Society of Mechanical Engineering (ASME)

#### OTHER PUBLIC SERVICE:

- 1985-1986 President, New York Nu (Buffalo) Chapter of Tau Beta Pi (Engineering Honor Society)
- 1990-1991 Board Member, Longwood Symphony Orchestra, Boston, MA
- 2003 Program Committee American Society of Biomechanics Conference
- 2006 Symposium Organizer: "Future Directions for Occupational Biomechanics" American Society of Biomechanics, Blacksburg, VA
- 2010- Founding member of Boston Cyclists' Union, Boston, MA.

#### DEPARTMENT AND SCHOOL SERVICE:

- 1992-1995 Member, UC Berkeley Mechanical Engineering Graduate Student Council
- 1995-1996 Member, Chancellor's Campus Advisor Committee, for Lesbian, Gay, Bisexual, and Transgender Concerns, University of California, Berkeley
- 2000 - 2012 Faculty Advisory Committee, Center for Continuing and Professional Education  
Harvard T.H. Chan School of Public Health
- 2001 - 2004 Working Group on Woman, Gender and Health,  
Harvard T.H. Chan School of Public Health
- 2002 - 2004 Assistant Professor Representative, Faculty Council,  
Harvard T.H. Chan School of Public Health,
- 2005 - 2008 Great Place to Work Committee and Awards Reviewer,  
Harvard T.H. Chan School of Public Health
- 2006 - 2012 Exposure, Epidemiology, and Risk Program Curriculum Committee,  
Harvard T.H. Chan School of Public Health
- 2007 - 2008 Faculty Advisory Committee for Career Services Office,  
Harvard T.H. Chan School of Public Health
- 2008 - 2012 Committee on Admissions and Degrees, (CAD),  
Harvard T.H. Chan School of Public Health
- 2009- Internal Advisory Board, Center for Work, Health, and Wellbeing  
Harvard T.H. Chan School of Public Health,
- 2014 - 2016 Chair Search Committee, Department of Health Sciences, Northeastern University
- 2012 - 2014 Research Committee, Bouvé College of Health Sciences, Northeastern University
- 2014 - 2016 Faculty Council, Bouvé College of Health Sciences, Northeastern University
- 2014 - 2016 Provost's Advisory Committee on Tenure and Promotions, Northeastern University

- 2016 - 2017 Advance STRIDE Workshop Committee, Northeastern University  
 2012 - Faculty Search Committees (Chair), Department of Physical Therapy, Movement, and Rehabilitation Sciences, Northeastern University  
 2016 - Acting Chair, Tenure and Promotions Committee, Department of Physical Therapy, Movement, and Rehabilitation Sciences, Northeastern University  
 2017 Chair, Ad-Hoc Tenure and Promotions Committee, Department of Physical Therapy, Movement, and Rehabilitation Sciences, Northeastern University  
 2017- Senator representing Bouvé College of Health Sciences, Northeastern University Faculty Senate.

### MAJOR ADMINISTRATIVE RESPONSIBILITIES:

- 1994-1995 Chairperson, Berkeley Mechanical Engineering Graduate Student Council  
 2001 - Director and Co-Director, Occupational Injury Prevention Research Training Program  
 Harvard Education and Research Center for Occupational Safety and Health  
 2010 - Associate Director Harvard T.H. Chan School of Public Health's Center for Work, Health, and Wellbeing  
 2012 - 2016 Director of Research Department of Physical Therapy, Bouvé College of Health Sciences, Northeastern University  
 2015 - 2016 Chair Faculty Council, Bouvé College of Health Sciences, Northeastern University

### BUSINESS EXPERIENCE:

- 1999 - Consultant Clients include, Immersion, Logitech, Intuitive Surgical, WorkSafe, Myan Specialties, and Valeant Pharmaceuticals

### EDITORIAL BOARDS:

- 2002 - Contributing Editor: *Journal of Applied Biomechanics*  
 2005 - Editorial Board: *Human Factors*  
 2007 - Editorial Board: *Human Movement Science*  
 2011 - Editorial Board: *IIE Transactions on Occupational Ergonomics and Human Factors*  
 2012 - International Editorial Board: *Applied Ergonomics*  
 2013- Editorial Board *Preventing Chronic Disease: Public Health Research, Practice, and Policy*  
 2014- Senior Associate Editor, *Ergonomics in Design*  
 2015 Guest Editor for Special Issue *Ergonomics in Design: Combatting the Sedentary Workplace*  
 2017 Editorial Board, *Safety Science*

Ad hoc manuscript reviewer for: *American Industrial Hygiene Association Journal*, *American Journal of Industrial Medicine*, *American Society of Mechanical Engineering (ASME) Journal of Biomechanical Engineering*, *American Society of Mechanical Engineering (ASME) Journal of Dynamic Systems, Measurement, and Control*, *Applied Ergonomics*, *Clinical Biomechanics*, *Clinical Orthopaedics and Related Research®*, *Ergonomics*, *Institute of Electronic and Electrical Engineering (IEEE) Transactions on Systems, Man and Cybernetics*, *Institute of Electronic and Electrical Engineering (IEEE) Transactions on Biomedical Engineering*, *Institute of Electronic and Electrical Engineering (IEEE) Transactions on Neural Systems & Rehabilitation Engineering*, *Journal of Applied Physiology*, *Journal of Biomechanics*, *Journal of Electromyography and Kinesiology*, *Journal of Motor Behavior*, *Journal of Occupational and Environmental Hygiene*, *Journal of Occupational and Environmental Medicine*, and *Muscle and Nerve*.

## MAJOR RESEARCH INTERESTS:

Trained as an engineer, my research in public health takes a human systems approach to understand and prevent work-related injuries in order to and as well as improve worker health and wellbeing. Work-related injuries are a large public health burden. In the United States, estimated costs of work related injuries put the public health burden at \$192 billion per year, which is comparable to the \$219 billion annual burden of cancer (Leigh *Milbank Quarterly*, 2011: 89 (4), 728–772). In addition, work and work-related injuries are major social determinants of health. For example occupational physical activity has decreased significantly in the past 50 years. The associated decrease in energy expenditure associated with this decrease in physical activity can account for 80% of the increase in the average weight of Americans (Church et al. 2011 PLoS ONE, 6(5), e19657). However, currently workers in physically demanding jobs also have higher rates of all-cause mortality indicating that we need to create more knowledge about the design of work and its effect on health and wellbeing.

Our research has made significant contributions to science specifically in the areas of occupational safety and health with a focus in human-systems integration. These contribution address several industries including office work environments, commercial construction, health care (acute care hospitals), mining and transportation (truck drivers and bicyclists). My research interests fall under four major categories, which serve as a basis for my future research.

**Identifying organization pathways that influence worker safety and health outcomes:** At the heart of our work, especially our work at the Harvard T.H. Chan School of Public Health’s Center for Work, Health, and Wellbeing, we believe that workers and their health and safety behaviors are a response to the work environment and the conditions of work. Through organizational pathways, we can identify potential work organizational and work environmental factors that affect workers’ health. We have documented relationships between health outcomes and an organization’s policies and programs. In patient care units, we have reported associations between worker low back pain and a unit’s ergonomic practices. In construction we have documented associations between an organizations safety climate and worker injury outcomes. From these observed associations and theorized pathways we have built a conceptual framework routed with a human-systems approach that serves as a road map for our research within the Center.

**Intervention evaluation (comparative effectiveness) studies of workplaces programs and tools aimed at improving worker safety and health (Construction, Health Care, and Trucking)** Our intervention research spans several industries as well as spanning both organizational and physical ergonomic interventions. In terms of organizational ergonomics, we have developed and tested workplace programs on construction worksites. Our *B-Safe* program tested through a cluster randomized controlled trial, demonstrated a significant and improved effect on worksite safety climate scores through a low cost safety communication and recognition program that emphasizes safe working conditions rather than reports of injuries. The B-Safe Program is now being adopted by national commercial construction companies. Our *All the Right Moves* project (ARM) demonstrated through a cluster randomized controlled trail the positive effects on pain, diet and physical activity of a Total Worker Health program that integrates an ergonomics program into existing safety practices with a health week custom designed for construction workers. In terms of physical ergonomics, our Ride Project is testing the effects of a new tool, a seat suspension system that reduces whole body vibration by 50%, has on reducing trucker driver low back pain and fatigue. Our pilot studies that demonstrated a 25% reduction in low back pain scores with the use of this vibration canceling technology.

**Exposure assessment of physical risk factors and musculoskeletal disorders (Office, Trucking, and Mining):** While in theory physical risk factors are thought to be the immediate cause of work-related musculoskeletal disorders the empirical evidence linking these factors to outcomes has been limited due to the difficulty associated with directly measuring these risk factors. We have developed methods utilizing state of the art technology to measure risk factors for office workers and vehicle operators ranging from taxi drivers to heavy equipment operators in open pit coal mines. Through

these methods, we have documented relationships between duration of computer use and acute reports of upper extremity pain as well as identified physiological pathways for stress and biomechanics. Specifically, we have measured increased shoulder muscle activity in a set of office workers reporting higher job stress. We also documented that these stressed workers take fewer breaks than their less stressed counterparts. For taxi drivers and operators of heavy equipment operators we have developed estimates of whole body vibration exposure based on driving records and vehicle characteristics. For both we have observed associations between the health outcome and the exposure as well as high risk exposures.

**The effects of computer technology and tool design on upper extremity biomechanics:** Within the ecological framework of computer related musculoskeletal disorders, computer technology has a direct effect on the biomechanics of the user. As a result, this technology places loads on the upper extremity, increasing risk for these disorders. However, as technology changes to include more mobile computing technology and dynamic workstations such as sit-to-stand desks the effects of these changes are often unknown. Our work has continuously followed technology and evaluated the effects of design on the proximal outcomes of biomechanics. We have demonstrated that devices do matter and that some, but not all innovative designs can reduce biomechanical load. Our results have both influenced and validated the design of devices that are currently on the market. In addition, we have developed user and designer guidelines to optimize upper extremity biomechanical loads.

## RESEARCH SUPPORT

### *Past funding:*

1999-2009	NIOSH	PI	R01 OH003997 Tools for exposure assessment of physical risk factors of VDT Workers
2000-2003	Whitaker Foundation	PI	Predicting the Dynamic Tension of the Finger Flexor Muscles & Tendons of VDT Workers
2004-2009	NIOSH/CPWR <sup>i</sup>	Investigator	U54OH008307 Interventions for falls from ladders in construction (CPWR, PI: Perry)
2007-2012	NIOSH	PI	R01 OH008373 Upper Extremity Dynamics during Keying
2008-2013	NIOSH	PI	R01 OH008781 Interactions of biomechanics & psychosocial stressors & MSDs in the modern office)
2009-2014	NIOSH	PI	U60OH009762-01. Safety Culture/Safety Incentives in the Construction Industry (CPWR).
2012-2013	SHIP <sup>ii</sup>	Co-PI	Randomized Controlled Trial of a Whole Body Vibration intervention in Truck Drivers (University of Washington)
2013-2014	Mylan Specilities		

<sup>i</sup> Center for Construction Research and Training, formally the Center for the Protection of Workers' Rights

<sup>ii</sup> Safety and Health Investment Projects (SHIP) Washington State Department of Labor & Industries

		PI	Evaluating the Physical Form of Autoinjectors on the Effectiveness of Transmitting Force and Maintaining Position and Orientation of the Injector (\$114,953)
2010-2016	NSF <sup>iii</sup>	Co-PI	0964220. A Toolkit to Evaluate the Effect of Multitouch Interaction on the Musculoskeletal System and Design Safe Multitouch Systems (Subcontract to Arizona State University, \$476,558)
2011-2016	NIOSH	Co-PI <sup>iv</sup>	Northeast Fisheries Winch Safety Improvement Project. (Subcontract from New York Center for Agricultural Disease and Injury Research, Education, and Prevention/(CDC/NIOSH) \$1,196,912)
2013-2016	Alpha Foundation	PI	Whole Body Vibration Exposure and Injury Prevention of Heavy Equipment Operators in Open Pit Coal Mine (\$617,204)

### **Current Funding**

2007-2021	NIOSH	Co-PI	U19 OH008861 Harvard T.H. Chan School of Public Health, Center for Work, Health, and Wellbeing (PI – Sorensen G.) Project B: Integrated Approaches to Health and Safety in the Dynamic Construction Work Environment (1,387,805 for Project B for 2011-2016)
2013-2018	NIOSH	PI	1 R01 OH010097 Randomized Controlled Trial of a Whole Body Vibration intervention in Truck Drivers (\$2,188,880)
2014-2019	NIOSH/CPWR <sup>iii</sup>	PI	U60OH009762. Development and Evaluation of Contractor Safety Pre-Qualification Tool (Subcontract to CPWR, \$986,000).
2014-2019	NIOSH	Investigator	U60OH009762. Enhancing Safety Climate through OSHA 30 Transformational Leadership Training (CPWR PI: Goldenhar).
2014-2017	NIOSH	Investigator	R21OH010564. Modifying the Workplace to Decrease Sedentary Behavior and Improve Health. (PI: John)
2017-2018	Alpha Foundation	Investigator	Systematic Evaluation of Multi-axial Suspension to Reduce Whole Body Vibration Exposures in Heavy Equipment Mining Vehicle Operators (\$480,818 PI: Kim)

### **TRAINING**

<sup>iii</sup> National Science Foundation

<sup>iv</sup> PI during submission and year 1 at Harvard T.H. Chan School of Public Health, but relinquished PI when appointed at Northeastern

2001-2018 NIOSH Program-Director  
 T42 OH008416 Training Program in Occupational Injury  
 Prevention Research (Part of the Harvard Education and  
 Research Center for Occupational Safety and Health)

### INTERNAL RESEARCH SUPPORT

2000 Changes in the EMG signal power spectrum during repetitive tasks (Liberty Mutual Harvard Pilot Projects PI: Jack Dennerlein)

2001 Occupational injuries among bicycle messengers (CDC Harvard Injury Center Pilot Projects PI: Jack Dennerlein)

2001 Postural Stability Measurement of a clinical population (Liberty Mutual Harvard Pilot Projects PI: Maura Iversen)

2004 Effects of keyboard horizontal position within the workstation (NIOSH Harvard ERC Pilot Projects PI: Jack Dennerlein)

2006 Cellular responses of muscle cells to mechanical stretch (Department of Environmental Health Jr. Faculty Initiative PI: Jack Dennerlein)

2006 Physical exposure assessment for epidemiological research of musculoskeletal disorders (NIOSH Harvard ERC Pilot Projects PI: Jack Dennerlein)

2010 Upper Extremity Kinematics and Kinetics among Computer Workers with Hand Osteoarthritis (NIOSH Harvard ERC Pilot Projects PI: Jack Dennerlein)

2011 Biomechanics of the thumb during tablet use (NIOSH Harvard ERC Pilot Projects PI: Jack Dennerlein)

2012 Development and Validation of an Ergonomic Survey Instrument among New England Construction Workers (NIOSH Harvard ERC Pilot Projects PI: Jack Dennerlein)

2012 Protecting Every Construction worker's Knee (PECK) Pilot Study (NIOSH Harvard ERC Pilot Projects PI: Jack Dennerlein)

2012 Examining Safety Climate Perceptions and Health Outcomes (NIOSH Harvard ERC Pilot Projects PI: Jack Dennerlein)

2013 'Standing Up' Against Sedentary Behavior: A Pilot Study in Office Workers (PI Jack Dennerlein with Denish John) (HSPH Center for Work, Health, and Well-being Pilot Project)

2013 Simulation modeling of construction workers to estimate and mitigate the effects of the dynamic construction worksite. (PI Jack Dennerlein with Justin Manjourides) (HSPH Center for Work, Health, and Well-being Pilot Project)

2014 The relationship between musculoskeletal pain and length of time spent working on commercial construction sites – the workers' perspective. (NIOSH Harvard ERC Pilot Project PI: Jack Dennerlein with Emily Sparer)

2016 Mental health and wellbeing in Construction Workers (PI: Jack Dennerlein) Northeastern Tier 1 Interdisciplinary Grants

### INDUSTRIAL RESEARCH GIFTS

2001 Office Ergonomics Research Committee

2004 Microsoft

2005 Office Ergonomics Research Committee

2006 Microsoft

2006 Intuitive Surgical

2008 Microsoft

2010 Office Ergonomics Research Committee

2011 Microsoft



2010 Office Ergonomics Research Committee  
 2012 Contour  
 2012 Office Ergonomics Research Committee  
 2015 MicroSoft  
 2016 Office Ergonomics Research Committee

## REPORT of TEACHING

### SEMESTER COURSES

1985 University at Buffalo  
 FORTRAN  
 Teaching Assistant  
 Supervised ~30 Undergraduate engineering students once a week in a computer laboratory

1993 University of California, Berkeley  
 Controls and System Dynamics  
 Teaching Assistant, supervised ~30 undergraduate students in one-hour recitations that met once per week.

1997 Harvard John A. Paulson School of Engineering and Applied Sciences  
 Robotics (ES 178)  
 Teaching Fellow, 12 undergraduate and graduate students.

1999 Harvard John A. Paulson School of Engineering and Applied Sciences  
 System Analysis with Physiologic Applications (ES145)  
 Course Instructor, 30 undergraduate and graduate engineering students

2001 Harvard John A. Paulson School of Engineering and Applied Sciences  
 Muscles, Reflexes and Locomotion (DEAS ES148)  
 Instructor, 18 undergraduate and graduate bioengineering students

1999-2014 Harvard T.H. Chan School of Public Health  
 Ergonomics and Human Factors (EH243)  
 Course Instructor; ~15 graduate students and medicine residents in occupational health

2001-2015 Harvard T.H. Chan School of Public Health  
 Occupational Safety and Injury Prevention (EH241)  
 Course Instructor; ~10 graduate students in occupational health

2001-2012 Harvard T.H. Chan School of Public Health  
 Occupational Biomechanics (EH296)  
 Course Instructor; ~5 graduate students in occupational health

2001-2012 Harvard T.H. Chan School of Public Health  
 Industrial Hygiene/Ergonomic Internship & Environmental Sciences Research Seminar (EH 267)  
 Co-Instructor; ~1 graduate student per year

- 2000 - 2012 Harvard T.H. Chan School of Public Health  
Industrial Hygiene/Ergonomics Internship (EH273)  
Co-instructor: ~ 1 graduate student per year
- 2003 Harvard T.H. Chan School of Public Health  
Field Methods in Environmental Health (EH280)  
Co-instructor: ~10 graduate students in occupational and environmental health.
- 2008 - Harvard T.H. Chan School of Public Health  
Bicycle Environments (ID539)  
Co-instructor: ~8 graduate students in public health and design.
- 2012 Harvard T.H. Chan School of Public Health  
Transdisciplinary Research in the Study of Occupational Health and Safety (EH528)  
Grading Instructor: ~ 5 graduate students in public health.
- 2013 - Northeastern University  
PT Capstone Project (PT5000)  
Course Instructor, ~3 Doctoral of Physical Therapy Students
- 2015 - Northeastern University  
Ergonomics and the Work Environment (PT5600)  
Course Instructor, ~5 Doctoral of Physical Therapy Students
- 2017 - Northeastern University  
Research (PT5010)  
Course Instructor, ~125 1<sup>st</sup> year Doctoral of Physical Therapy Students.

#### CONTINUING AND PROFESSIONAL EDUCATION

- 2000-2015 Executive and Continuing and Professional Education, Harvard T.H. Chan School of Public Health  
Ergonomics and Human Factors: Strategic Solutions for Workplace Safety and Health  
Course Director: ~45 health and safety professionals from the US and abroad per year
- 2002-2015 Executive and Continuing and Professional Education, Harvard T.H. Chan School of Public Health  
Comprehensive Industrial Design  
Course Faculty: ~50 health and safety professionals from the US and abroad
- 2006 Cyprus International Institute, Nicosia, The Republic of Cyprus  
Occupational Ergonomics and Safety (3-day class)  
Course Director: ~30 health and safety professionals from South Eastern Europe
- 2006-2015 Executive and Continuing and Professional Education, Harvard T.H. Chan School of Public Health  
Guidelines for Laboratory Design  
Course Faculty: ~50 architects, engineers and health and safety professionals from the US and abroad

- 2007 Department of Continuing Education, Harvard Medical School  
The Global Clinic 2007: Healthcare Management for Physician Executives  
Guest Faculty: ~100 Healthcare managers and physicians.
- 2008 Centro de Education Continua, Universidad Javeriana  
Electromyography and applications in occupational health.  
Course Faculty (Fulbright Senior Specialist): ~15 Occupational health students, physicians, and practitioners.
- 2009 - 2013 Executive and Continuing and Professional Education, Harvard T.H. Chan School of Public Health  
Safety in Design & Construction  
Course Co-Director: ~35 architects, engineers and health and safety professionals from the US and abroad
- 2012- Executive and Continuing and Professional Education, Harvard T.H Chan School of Public Health  
Work, Health, and Wellbeing: Strategic Solutions for Integrating Wellness and Occupational Safety and Health in the Workplace  
Course Faculty – 50 Health and Safety Professionals from the US and abroad.  
Course Co-Director for 2015

#### GUEST LECTURES

Year	Institution	#Lectures/year	#Students	Class Name
1999-2012	Harvard Chan	1	~50	Intro to Environmental Health (EH201)
2000-2006	Harvard Chan	1	~50	Environmental and Occupational Epidemiology (EPI 215)
2000-2012	Harvard Chan	3	~20	Practice of Occupational Health (ID263)
2000-2009	Harvard Chan	1	~12	Analytical Methods and Exposure Assessment (EH 263)
2000-2004	Harvard Chan	1	~18	Epi of Environmental and Occupational Regulations (EH236)
2000-2003	Harvard Paulson	4	~30	System Analysis with Physiologic Applications (ES145)
2001-2011	Harvard Chan	1	~15	Exposure Assessment for Epidemiology (EH269)
2003-	Harvard Chan	1	~40	Women and Gender Health, Introductory Perspectives (WGH 211)
2004-2013	BU SPH	1	~15	Exposure Assessment
2009-2014	Harvard Chan	1	~16	Bicycle and Urban Designs.
2015 -	Northeastern	1	~19	Introduction to Public Health

#### STUDENTS, POST-DOC FELLOWS, AND JUNIOR FACULTY ADVISEES

<u>Junior faculty and K-grant trainees</u>	<u>Position</u>
2005-2009 Judith Gold (K)	Assistant Professor, Temple University
2012- Steven Yen	Assistant Professor, Northeastern University
2012- Justin Manjorides	Assistant Professor, Northeastern University
2013-2016 Alberto Caban-Martinez (K)	Associate Professor, University of Miami
2013-2018 Dennis Anderson (K)	Instructor in Orthopedic Surgery, Harvard Medical School
2012-2014 Ameer Seitz (K)	Assistant Professor, Northwestern University

2014-2017	Erika Sabbath (K)	Assistant Professor, Boston College
2015-2018	Jennifer Cavalari (K)	Assistant Professor, University of Connecticut Medical Center
2016-2017	Lauren Murphy Emily Sparer (K)	Assistant Clinical Professor, Northeastern University Research Fellow, Harvard University

<u>Post-Doctoral Fellows (*co-mentorship)</u>	<u>Current Position</u>	
1999-2000	Yanhong Zhou, Ph.D.	Faculty, Huazhong University, China
1999-2000	Peter Johnson, Ph.D.	Faculty, University of Washington
1999-2001	Kirsty Bennie Kerin, Ph.D.	Private Industry
2001-2003	Devin Jindrich, Ph.D.	Faculty, California State University, San Marcos
2002-2004	Ernst Lee, MD	Private Practice
2002-2004	Erik Won, MD	Private Practice
2005-2007	Ramaswamy Krishnan*	Instructor, Harvard University
2007-2007	Lope Barerro, Sc.D.	Associate Professor, Javeriana University, Bogota
2008-2009	Che-Hsu Chang, Sc.D.	Consultant, Private Industry
2008-2009	Robert Catena, Ph.D.	Assistant Professor, Washington State University
2007-2010	Krishna Asundi, Ph.D.	Private Industry (Apple)
2008-2010	Xu Xu, Ph.D.	Assistant Professor, NC State University
2010-2012	Gert Faber, Ph.D.	Assistant Professor, VU University
2010-2012	Justin Young	Assistant Professor, Kittering University
2011-2013	Alberto Cabán-Martínez*,	DO, PhD, MPH Associate Professor, University of Miami
2011-2014	Lauren Murphy, Ph.D.	Assistant Clinical Professor, Northeastern University
2012-2013	Sohit Karol, Ph.D.	Private Industry (MicroSoft)
2013-2014	Ana Barbir, Ph.D.	Private Industry
2013-2015	Shu-Ling Chiu, Ph.D.	Post-doctoral Fellow, Harvard University.
2014-2016	Erin Teeple, MD, MOH	Post-doctoral Fellow, Harvard University
2015-2017	Philip Dixon, Ph.D.	Post-doctoral Fellow, Harvard University
2016-	Boyi Hu, Ph.D.	Post-doctoral Fellow, Harvard University
2017	Susan Peters, Ph.D.	Post-doctoral Fellow, Harvard University

<u>Doctoral Student Advisor (12 total)</u>	<u>Current Position</u>	
2004-2007	Lope Barerro, Sc.D	Assistant Professor, Javeriana University, Bogota
2003-2007	David Lee, Sc.D.	Design Ergonomist, Google, Sunnyvale, CA
2003-2008	Joe Chang Sc.D.	Consultant, Private Industry
2005-2010	Jin Qin	National Institute for Occupational Safety and Health
2008-2013	Jennifer Bruno Garza	Post-Doctoral Fellow, University of Connecticut
2009-2010	Karen Hopcia	Occupational Health, Partners, Chicago
2009-2013	Matthieu Trudeau	Private Industry
2009-2014	Oscar Arias	Associate Director, UCLA, ERC
2011-2015	Emily H. Sparer	Post-Doctoral Fellow, Harvard University
2013-2015	Michael Lin	Usability and Product Developer, MicroSoft
2013-2016	Michael Grant	Fellow, National Institute for Occupational Safety and Health
2015-	Sara Coppola	Doctoral Student, Harvard University

<u>Master Student Advisor (16 total)</u>	<u>Current Position</u>	
1999-2001	Korrie Mapp, SM	CEO of Organic Ergonomics
2001-2003	Antonio Chemor-Ruiz, SM	Manager, Mexico Regional Government
2001-2003	Maria-Helena DiMarino	Harvard University (Deceased 2003)
2002-2004	Lope Barerro, Sc.D	Assistant Professor, Javeriana University, Bogota
2003-2004	Sara Mortenson, MBA/SM	Private Industry

2007	Karen Oude Hengel, MSc	Researcher, VU University Amsterdam
2007	Annemeik Houwink, MSc	Researcher, Radboud University Nijmegen
2008-2010	Hua Chen	Private Industry
2008-2010	Tawan Udtamadilok	Private Industry
2009-2010	Julia Roos	Private Industry
2009-2011	Emily Sparer	Graduate Student, Harvard University
2010-2012	Lynn Onyebeke	University Research Assistant
2011-2013	Michael Lin	Graduate Student, Harvard University
2011-2013	Torey Jerauld	Private Industry
2011-2013	Michael Grant	Graduate Student, Harvard University
2013-2015	Emily Eshleman	Medical Student, University of Maine
2014-2016	John Schilkowsky	Graduate Student, Northeastern University
2015-2016	Rory Steward	Graduate Student, Harvard University

#### Doctoral Student Committee Member or Mentor\*

1999	Maria Yang*, Ph.D.	Faculty, MIT
1999	Paris Wellman, Ph.D.	Private Industry
2000	Allison Okamura*, Ph.D.	Faculty, Stanford University
2000	Fuji Lai, S.M.	Private Industry
2002	J.C. Chen, Sc.D.	Faculty, University of Southern California
2004	Solomon Diamond, Ph.D.	Faculty, Dartmouth
2006	Christopher Wagner, Ph.D.	Private Industry
2006	Monica Daley, Ph.D.	Lecturer, RVC University of London
2007	Camie Chaumont Menéndez, Ph.D.	Epidemiologist, Center for Disease Control
2005-2009	Chris Richards, Ph.D.	Research Fellow, The Rowland Institute, Harvard University
2009-2010	Christopher Ronk	Private Industry
2012-2014	Jorge Andrés Alvarado	Assistant Professor, Javeriana University, Bogotá
2013-2015	Jean Alexander Pulido	Student, Javeriana University, Bogotá (Deceased 2015)
2015-	Adina Elena Draghici	Student, Bioengineering, Northeastern, University

#### Doctoral Student Defense Opponent

2004	Bart Visser, Ph.D.	VU University, Amsterdam
2010	Gert Faber, Ph.D.	VU University, Amsterdam
2011	John Collins, Ph.D.	University of Limerick, Ireland
2013	Pieter Coenen, Ph.D.	VU University, Amsterdam
2014	Kaitlin Gallagher	University of Waterloo, Ontario Canada
2016	Morten Villumsen	Aalborg University, Denmark
2016	Tessy Luger	VU University, Amsterdam

#### Undergraduates and DPT Students.

1997-1998	Jay Kimmelman	Harvard: Founding Principal at New Globe Partners
1997-1999	Ken Ihara	Harvard: Past Vice President at Citigroup
1999	David Martin	Dartmouth
1999-2001	Michael Brody	Harvard
1999-2000	Thomas J. Withrow	Harvard: Faculty, Vanderbilt University
2000-2001	Silas Wang	Harvard: M.D., Private Practice
2001-2003	Aruna Balakrishnan	Harvard: Google User Experience
2008	Karen Lin	University of British Columbia
2009	Arun Saigal	M.I.T.
2012	Erik Iversen	Northeastern University

2012-2013	Brian Conlon:	Northeastern University
2012-2013	Shannon Harrington	Northeastern University
2012-2013	Linnea Peterson	Northeastern University
2013	Kaylin Mai	University of Massachusetts, Boston
2013-2014	Vanessa Peck	Northeastern University
2013-2014	Eric Heath	Northeastern University
2013-2014	Dewang Chauhan	Northeastern University
2014-2015	Mark Janelli	Northeastern University
2015-2016	Kelsey Jonas	Northeastern University
2015-2016	Nickolas Ing	Northeastern University
2016-2017	Jessica L Orpen	Northeastern University
2016-2017	Marin Kitamura	Northeastern University
2017-	Kyle Nameth	Northeastern University
2017-2018	Tavia Allen	Northeastern University
2017-2018	Kayla Wegener	Northeastern University
2017-2018	Meghan McPhee	Northeastern University

## INVITED TALKS and GUEST LECTURES

### NATIONAL & INTERNATIONAL:

1994	Fingertip Kinematics and Forces During Typing. Marconi Conference, Office Ergonomics Research Committee, Marshall CA.
1996	Force Transmission of the Fingertip Pulp During Keyboard Like Work. Marconi Conference, Office Ergonomics Research Committee, Marshall CA
1996	In Vivo Measures of Finger Flexor Tendons Force. Occupational Medicine Research in Progress Forum, University of California, San Francisco
1996	Determining Tissue Dosage: In Vivo Finger Flexor Tendon Force. MPH Seminar Series, Department of Public Health, University of California, Berkeley
1996	The Biomechanics and Control of Human Finger Movement During Computer Keyboard Work: The Forces of the extrinsic finger muscles. The Occupational and Industrial Orthopaedic Center, Hospital for Joint Diseases and New York University.
1997	Tendon Force during a Keystroke. Marconi Conference, Office Ergonomics Research Committee, Marshall CA, 1997.
2001	The biomechanics and exposure assessment of computer interface designs Robens Centre for Health Ergonomics, University of Surrey, United Kingdom
2002	Haptic Technologies for Computer Pointing Devices. Marconi Conference, Office Ergonomics Research Committee, Marshall CA.
2002	Exposure assessment of computer interface designs: from biomechanics to human factors. Department of Industrial Engineering Seminar Series, University at Buffalo, State University of New York

- 2002 Aspects of finger biomechanics during touch typing.  
Center for Ergonomics Seminar Series, University of Michigan, Ann Arbor, MI
- 2003 Work-related musculoskeletal disorders and injuries: From office workers to bicycle messengers  
ENVH 580 Department of Environmental Health, University of Washington, Seattle, WA.
- 2004 Dynamical aspects of the finger during typing and tapping  
Rehabilitation Institute of Chicago, Northwestern University, Chicago, IL
- 2004 Dynamical aspects of the finger during typing and tapping  
Department of Biomedical Engineering, Marquette University Milwaukee, WI
- 2004 Occupational Ergonomics and Injury Prevention  
Jishou University, Jishou, China
- 2004 Finger biomechanics during typing and tapping  
Faculty of Human Movement Sciences, VU University, Amsterdam, The Netherlands
- 2005 Relating Worker Fatigue with Keyboard Forces and Typing Performance.  
Marconi at Marigold Conference, Office Ergonomics Research Committee, Marigold, MI
- 2005 The Office Environment and Health.  
IIDEX (International Interior Design Exhibition), Toronto, Ontario
- 2006 Measuring biomechanics in the field for ergonomic studies. Athens University Medical School, Greece
- 2006 The Contribution of the Wrist, Elbow and Shoulder Joints to fingertip tapping. Center for Ergonomics Seminar Series, University of Michigan, Ann Arbor, MI, 2006.
- 2007 Validating Computer Usage Monitors,  
Marconi at Marigold Conference, Office Ergonomics Research Committee, Marigold, MI
- 2008 Urban design for biking: Removing environmental impediments around safety in the United States  
Cycling and Health Tech Industry R&D Center, Taichung, Taiwan
- 2009 Estimating Computer Exposures ,  
Marconi Conference, Office Ergonomics Research Committee, Marshall, CA
- 2009 Injury rates on cycle tracks: the myth that bike lanes are unsafe  
Cycling and Health Tech Industry R&D Center, Taichung, Taiwan
- 2009 Biomechanical Exposures: Determining Injury and Disorder Mechanisms **Keynote Speaker**: X2009 Sixth International Conference on Innovations in Exposure Assessment, Boston, MA
- 2010 Linking Research to Reality - Prevention of Upper Extremity Musculoskeletal Injury: **Keynote Speaker**. Association of Canadian Ergonomists 41st Annual Conference, Kelowna, BC October, 2010
- 2010 Fatigue of the forearm muscles associated with repetitive wrist movements.

- Ergonomic Interventions and Research: Preventing Musculoskeletal Fatigue and Injury Conference, University of Michigan and University of California, Oakland, CA, December 2010
- 2011 Using a Work Systems Analysis to Redesign Computer Task Exposures in Radiologists. Marconi Conference, Office Ergonomics Research Committee, Marshall CA. January 2011
- 2012 Tablet computer use and upper extremity postures and muscle load, Marconi at Marigold Conference, Office Ergonomics Research Committee, Holland, MI, June 2012
- 2012 Preventing work-related musculoskeletal disorders in the modern office. Lawrence Berkeley National Laboratory Ergonomics Distinguished Lecture Series, Berkeley, CA. July 2012
- 2012 Evidence-based Ergonomics in Computer Use. **Keynote Speaker**. Twenty-Fifth Annual Occupational Safety and Health Institute, University of California, Center for Occupational and Environmental Health, Oakland, CA July 2012
- 2014 How mobile technology is changing the paradigm of office ergonomics. **Featured Speaker**, Applied Ergonomics Conference, Orlando, FL 26 March 2014
- 2014 Occupational physical activity in health care and construction: work's contribution to workers' weekly recommended levels of physical activity. Chevron Global Wellness Network Meeting. 20 May 2014
- 2014 Physical Ergonomics Biomechanics and Ergonomics of the Modern Office: Identifying Injury Pathways. **Keynote Speaker**. HFES Inter-University Workshop, University of Buffalo, Buffalo NY, 15 November 2014.
- 2015 Improving Safety Culture through Workplace Programs. National Perspectives on Ergonomics, Workplace Design, and Health, 2015 Center for Occupational and Environmental Health Lela Morris Symposium, Berkeley, California. 22 May 2015
- 2015 Demystifying ergonomics for the modern office. Ergo-X (Human Factors and Ergonomics Society), **Featured Speaker**. Anaheim, CA 18 June 2015
- 2015 Safety management and culture. **Keynote Speaker** Working on Safety 2015, [www.wos2015.net](http://www.wos2015.net), University of Minho, Porto, Portugal, 24 September 2015
- 2016 The effects of systems and design on employee health and safety from the office to the construction site: identifying causal pathways through modern ergonomics and human factors. ERC Weekly Seminar, School of Public Health, University of Michigan, 8 January 2016
- 2016 B-SAFE: Safety Incentives and Safety Climate in Construction. Webinar, The Center for Construction Research and Training – CPWR, 20 January 2016
- 2016 Reflecting on experiences and lessons learned in integrated approaches for worker health and safety. **Keynote/Closing Session Speaker**. Mutual Summit 2016, Santiago, Chile, 27 May 2016



- 2016 Safety Incentives, Safety Climate, and Total Worker Health® in the Dynamic Environment of Commercial Construction. The Summer Institute, Oregon Health State University and Portland State University, Portland Oregon, 17 July 2016
- 2017 Demystifying ergonomics in the Modern Office. **Hallman Lecture**, Applied Health Sciences, University of Waterloo, Ontario, Canada. 26 October 2017

### REGIONAL (New England)

- 1997 Sensing the Forces of the Human Hand during Touch-Typing.  
Harvard Robotics Seminar Series, Cambridge, MA
- 1998 Finger flexor tendon forces and the control of finger movements during typing.  
Boston University Neuromuscular Research Center Seminar Series, Boston MA
- 1999 Forces of a finger flexor tendon during keyboard-work: They're higher than you think.  
University of Massachusetts, Lowell, Lowell MA
- 1999 Biomechanics of the Hand and Finger: An Ergonomic Question.  
Sargent College of Physical Therapy, Boston University, Boston MA
- 2000 Adding Vibrotactile Feedback to Real-World Telerobots  
Quarterly Biomedical Engineering and Minimally Invasive Surgery Symposium,  
University of Massachusetts, Worcester, MA.
- 2000 The Role of Passive & Active Muscle Force During Touch-Typing  
Biodynamics and Ergonomics: Improving Health and Human Performance and  
Identifying Opportunities for Technology Transfer Symposium, Department of Medicine,  
University of Connecticut, Farmington, CT..
- 2001 The Ergonomics of a Force-Feedback Mouse,  
Media Lab, Massachusetts Institute of Technology, Cambridge, MA
- 2002 Office Ergonomics Workshop Lecture, **Keynote Speaker**  
Eighth Annual Millender Occupational Medicine Conference, New England Baptist  
Hospital, Boston, MA.
- 2002 Musculoskeletal Disorders and the Computer Workstation: Research Supporting  
Ergonomic Interventions.  
NECOEM/MaAOHN Annual Conference, Bedford, MA
- 2003 Office Ergonomics Workshop Lecture  
Ninth Annual Millender Occupational Medicine Conference, New England Baptist  
Hospital, Boston, MA
- 2003 Exposure Assessment of Computer Work: From Design to Usability.  
Dept of Work Environment, University of Massachusetts, Lowell, MA
- 2003 Bicycle Messenger Injuries: Lessons from Urban Cyclists  
Moving Together 2003: Massachusetts Statewide Bicycle and Pedestrian Conference,  
Worcester, MA

- 2004 Occupational Bicycle Injuries  
Department of Environmental and Occupational Medicine, Yale University New Haven, CT
- 2004 Ergonomics for the operating room nurse  
Association of periOperative Registered Nurses (AORN), Massachusetts Chapter 1, Boston, MA
- 2005 - Exposure Assessment for Work-Related Injury and Musculoskeletal Disorders, Boston University
- 2006 Ergonomics and Musculoskeletal Disorders  
Workplace Theory and Policy seminar, Yale Law School
- 2006 The Contribution of the Wrist, Elbow and Shoulder Joints to fingertip tapping.  
Kinesiology Department Seminar, University of Massachusetts, Amherst.
- 2007 The dynamics of the finger and upper extremity during repetitive occupational tasks  
Department of Mechanical Engineering, Cornell University
- 2008 Upper extremity dynamics during keying.  
Department of Mechanical Engineering, Tufts University
- 2008 Ergonomics and Injury Prevention in Health Care  
Grand Rounds, Department of Radiology, Beth Israel Deaconess Medical Center, Boston MA
- 2008 Ergonomics and Upper Extremity Disorders Among Computer Users.  
NECOEM/MAAOHN Annual Conference, Bedford, MA
- 2009 Work-related musculoskeletal disorders: identifying injury pathways through biomechanics. Grand Rounds to the Harvard Combined Orthopaedic Surgery Residency Program, Boston, MA
- 2010 Applying ergonomics in health care: The challenges and successes for radiology.  
Grand Rounds, Department of Radiology, Beth Israel Deaconess Medical Center, Boston MA
- 2011 Motor Control in Ergonomics: Applications in Human Computer Interfaces. The Boston Action Club, Northeastern University.
- 2012 Prevention of Work and Computer Related Musculoskeletal Disorders<  
Department of Occupational Therapy Student Seminar Series, Boston University, Boston, MA
- 2012 Fundamental ergonomics in design.  
Rhode Island School of Design, Providence, RI, October
- 2013 Upper extremity biomechanics in environmental and public health, from design to behavior. Rhode Island Hospital, Lifespan. February 2013

- 2014 Occupational physical activity in health care and construction: work's contribution to workers' weekly recommended levels of physical activity. Massachusetts Department of Public Health, Occupational Health Surveillance Seminar. 20 March 2014
- 2014 Ergonomics of the modern office: mobile technology to dynamic workstations: Harvard Club and the Massachusetts Chapter of the Fulbright Association. 18 November 2014
- 2017 Safety Culture and Climate: Construction Worker Safety and Health. New England Chapter of American Industrial Hygiene Meeting, Norwood, MA, 1 November 2017

### Selected Citations in the General Media

- Boston Globe** Goldberg D. (2002) Dickey deliveries survey finds risk runs high for Boston's bike couriers. 21 November 2002.
- Seattle Times.** Sanders E (2003). Keeping Downtown Rolling: Flouting the system and serving it, messengers deliver. <http://old.seattletimes.com/pacificnw/2003/0831/cover.html>
- Boston Globe** Lewis E. (2004) Lab aims to cut rate of injuries on the job. 28 June 2004
- Slate** Perlstein L (2010) Rethinking the School Desk: Is the best way to fix the American classroom to improve the furniture? 26 October 2010  
[http://www.slate.com/articles/news\\_and\\_politics/the\\_hive/2010/10/rethinking\\_the\\_school\\_desk.html](http://www.slate.com/articles/news_and_politics/the_hive/2010/10/rethinking_the_school_desk.html)
- Boston Globe** (2011) Health Answers. 14 March 2011
- Los Angeles Times** (2012) Harvard study finds the iPad can be a pain in the neck. 25 January 2012  
<http://latimesblogs.latimes.com/technology/2012/01/harvard-researchers-ergonomics-ipad.html>
- Boston Globe** Kotz, D. (2012) 3 ways to avoid iPad neck strain. 6 February 2012  
<https://www.bostonglobe.com/lifestyle/health-wellness/2012/01/30/ways-avoid-ipad-neck-strain/iAnSo2Y84p6kOzAqg09p1O/story.html>
- Boston Globe** Pierce K. (2012) Many employees abandon sitting while working 31 May 2012  
<https://www.bostonglobe.com/business/2012/03/25/employees-take-stand/GWtLOR2tUKRoeuB9ymEU2l/story.html>
- New York Times Magazine** Kennedy P (2012) Who Made That Escape Key? 5 October 2012  
[http://www.nytimes.com/2012/10/07/magazine/who-made-that-escape-key.html?\\_r=0](http://www.nytimes.com/2012/10/07/magazine/who-made-that-escape-key.html?_r=0)
- New York Times** Parker-Pope T (2013) Ask Well: Help for the Deskbound. 15 January 2013  
<http://well.blogs.nytimes.com/2013/01/15/ask-well-help-for-the-deskbound/>
- Cook's Illustrated** (2013) Chef's Knives. September 2013  
[https://www.cooksillustrated.com/equipment\\_reviews/1433-chefs-knives](https://www.cooksillustrated.com/equipment_reviews/1433-chefs-knives)
- The Wall Street Journal** Fowler G. (2014) Find the Best Phone-Screen Size for you. 26 March 2014  
<http://www.wsj.com/articles/how-to-find-the-phone-that-fits-your-hand-1395795606>
- Wired** Bonnington C (2014) A Bigger iPhone May Not Be Better, But It Makes Sense for Apple. 8 August 2014. <http://www.wired.com/2014/08/a-bigger-iphone/>
- Cook's Illustrated** (2016) Sauciers. February 2016  
[https://www.cooksillustrated.com/equipment\\_reviews/1661-sauciers](https://www.cooksillustrated.com/equipment_reviews/1661-sauciers)

- Forbs** Chamary JV (2016) Was Steve Jobs Right About Apple's Small iPhone SE? 23 March 2016 <http://www.forbes.com/sites/jvchamary/2016/03/23/small-phone-ergonomics/#6d3d53b336ff>
- The Wall Street Journal** Johannes L (2016) A Cure for Digital Addicts' 'Text Neck'? 23 March 2016 <http://www.wsj.com/articles/a-cure-for-digital-addicts-text-neck-1464019660>
- Business Insurance** Gonzalez G (2016) OSHA puts incentive plans under scrutiny 27 March 2016 <http://www.businessinsurance.com/article/20160327/NEWS08/303279982/osha-puts-workplace-safety-incentive-plans-under-scrutiny?tags=%7C80%7C304>
- Boston Magazine** Ducharme J (2016) Six Tips for Using Standing Desks Correctly 10 May 2016 <http://www.bostonmagazine.com/health/blog/2016/05/10/standing-desks/print/>
- The Washington Post** Cavanaugh Simpson, J. (2016) Digital disabilities – text neck, cellphone elbow – are painful and growing. 13 June 2016 [https://www.washingtonpost.com/national/health-science/digital-disabilities--text-neck-cellphone-elbow--are-painful-and-growing/2016/06/13/df070c7c-0afd-11e6-a6b6-2e6de3695b0e\\_story.html](https://www.washingtonpost.com/national/health-science/digital-disabilities--text-neck-cellphone-elbow--are-painful-and-growing/2016/06/13/df070c7c-0afd-11e6-a6b6-2e6de3695b0e_story.html)
- Wired** Rhodes, M (2016) You'll Miss the Escape Key Even Less Than Your Headphone Jack. 27 October 2016. <https://www.wired.com/2016/10/youll-miss-escape-key-even-less-headphone-jack/>
- Reuters** Rapaport, L. (2016) Safe patient handling linked to fewer worker injuries. 4 November 2016 <http://www.reuters.com/article/us-health-safety-patient-handling-idUSKBN12Z25G>

## BIBLIOGRAPHY

## PEER-REVIEWED JOURNAL ARTICLES:

1. Rempel D, **Dennerlein J**, Mote CD, Jr., Armstrong T. A method of measuring fingertip loading during keyboard use. *J Biomech* 1994; 27:1101-4. PMID: 8089165
2. **Dennerlein JT**, Miller JM, Mote CD, Jr., Rempel DM. A low profile human tendon force transducer: the influence of tendon thickness on calibration. *J Biomech* 1997; 30:395-7. PMID: 9075009
3. **Dennerlein JT**, Diao E, Mote CD, Jr., Rempel DM. Tensions of the flexor digitorum superficialis are higher than a current model predicts. *J Biomech* 1998; 31:295-301. PMID: 9672082
4. **Dennerlein JT**, Mote CD, Jr., Rempel DM. Control strategies for finger movement during touch-typing. The role of the extrinsic muscles during a keystroke. *Exp Brain Res* 1998; 121:1-6. PMID: 9698184
5. **Dennerlein JT**, Diao E, Mote CD, Jr., Rempel DM. In vivo finger flexor tendon force while tapping on a keyswitch. *J Orthop Res* 1999; 17:178-84. PMID: 10221833 (Open Access <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2665300/>)
6. **Dennerlein JT**, Yang MC. Haptic force-feedback devices for the office computer: performance and musculoskeletal loading issues. *Hum Factors* 2001; 43:278-86. PMID: 11592668
7. Okamura AT, Cutkosky MR, **Dennerlein JT**. Reality-Based Models for Vibration Feedback in Virtual Environments. *ASME/IEEE Transactions on Mechatronics* 2001; 6:245-253.
8. Ciriello VM, Bennie KJ, Johnson PW, **Dennerlein JT**. Comparison of Three Psychophysical Techniques to Establish Maximum Acceptable Torques of Repetitive Ulnar Deviation. *Theoretical Issues in Ergonomics Science* 2002; 3:274-284
9. **Dennerlein JT**, Soumekh FS, Fossel AH, Amick BC, 3rd, Keller RB, Katz JN. Longer distal motor latency predicts better outcomes of carpal tunnel release. *J Occup Environ Med* 2002; 44:176-83. PMID: 11851219
10. Bennie KJ, Ciriello VM, Johnson PW, **Dennerlein JT**. Electromyographic activity of the human extensor carpi ulnaris muscle changes with exposure to repetitive ulnar deviation. *Eur J Appl Physiol* 2002; 88:5-12. PMID: 12436265
11. **Dennerlein JT**, Meeker JD. Occupational injuries among Boston bicycle messengers. *Am J Ind Med* 2002; 42:519-25. PMID: 12439875
12. Jindrich DL, Zhou Y, Becker T, **Dennerlein JT**. Non-linear viscoelastic models predict fingertip pulp force-displacement characteristics during voluntary tapping. *J Biomech* 2003; 36:497-503. PMID: 12600340
13. Chen JC, Chang WR, Shih TS, Chen CJ, Chang WP, **Dennerlein JT**, Ryan LM, Christiani DC. Predictors of whole-body vibration levels among urban taxi drivers. *Ergonomics* 2003; 46:1075-90. PMID: 12850932
14. **Dennerlein JT**, Ciriello VM, Kerin KJ, Johnson PW. Fatigue in the forearm resulting from low-level repetitive ulnar deviation. *AIHA J (Fairfax, Va)* 2003; 64:799-805. PMID: 14674796
15. Chen JC, **Dennerlein JT**, Shih TS, Chen CJ, Cheng Y, Chang WP, Ryan LM, Christiani DC. Knee pain and driving duration: a secondary analysis of the Taxi Drivers' Health Study. *Am J Public Health* 2004; 94:575-81. PMID: 15054008 (Open Access <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1448301/>)
16. Chen JC, Chang WR, Shih TS, Chen CJ, Chang WP, **Dennerlein JT**, Ryan LM, Christiani DC. Using exposure prediction rules for exposure assessment: an example on whole-body vibration in taxi drivers. *Epidemiology* 2004; 15:293-9. PMID: 15097009

17. Jindrich DL, Balakrishnan AD, **Dennerlein JT**. Effects of keyswitch design and finger posture on finger joint kinematics and dynamics during tapping on computer keyswitches. *Clin Biomech* (Bristol, Avon) 2004; 19:600-8. PMID: 15234484
18. Jindrich DL, Balakrishnan AD, **Dennerlein JT**. Finger joint impedance during tapping on a computer keyswitch. *J Biomech* 2004; 37:1589-96. PMID: 15336934
19. **Dennerlein JT**. Finger flexor tendon forces are a complex function of finger joint motions and fingertip forces. *J Hand Ther* 2005; 18:120-7. PMID: 15891970
20. Lee EC, Rafiq A, Merrell R, Ackerman R, **Dennerlein JT**. Ergonomics and human factors in endoscopic surgery: a comparison of manual vs telerobotic simulation systems. *Surg Endosc* 2005. PMID: 16021368
21. Chen JC, **Dennerlein JT**, Chang CC, Chang WR, Christiani DC. Seat inclination, use of lumbar support and low-back pain of taxi drivers. *Scand J Work Environ Health* 2005; 31:258-65. PMID: 16161708 (Open Access [http://www.sjweh.fi/show\\_abstract.php?abstract\\_id=881](http://www.sjweh.fi/show_abstract.php?abstract_id=881))
22. Kuo PL, Lee DL, Jindrich DL, **Dennerlein JT**. Finger joint coordination during tapping. *J Biomech* 2006; 39:2934-42. PMID: 16161708
23. **Dennerlein JT**, Johnson PW. Different computer tasks affect the exposure of the upper extremity to biomechanical risk factors. *Ergonomics* 2006; 49:45-61. PMID: 16393803
24. Balakrishnan AD, Jindrich DL, **Dennerlein JT**. Keyswitch orientation can reduce finger joint torques during tapping on a computer keyswitch. *Hum Factors* 2006; 48:121-9. PMID: 16696262
25. **Dennerlein JT**, DiMarino MH. Forearm electromyographic changes with the use of a haptic force-feedback computer mouse. *Hum Factors* 2006; 48:130-41. PMID: 16696263
26. **Dennerlein JT**, Johnson PW. Changes in upper extremity biomechanics across different mouse positions in a computer workstation. *Ergonomics* 2006; 49:1456-69. PMID: 17028089
27. Barrero LH, Hsu YH, Terwedow H, Perry MJ, **Dennerlein JT**, Brain JD, Xu X. Prevalence and physical determinants of low back pain in a rural Chinese population. *Spine* 2006; 31:2728-34. PMID: 17077743
28. Lee DL, McLoone H, **Dennerlein JT**. Observed finger behaviour during computer mouse use. *Appl Ergon* 2008; 39:107-13. PMID: 17400173.
29. Chang CH, Amick BC, 3rd, Menendez CC, Katz JN, Johnson PW, Robertson M, **Dennerlein JT**. Daily computer usage correlated with undergraduate students' musculoskeletal symptoms. *Am J Ind Med* 2007; 50:481-8. PMID: 17450542
30. **Dennerlein JT**, Kingma I, Visser B, van Dieën JH. The contribution of the wrist, elbow and shoulder joints during single finger tapping. *J. Biomechanics*, 2007; 40, 3013-22, 2007. PMID: 17467717
31. Menendez CC, Amick BC, 3rd, Jenkins M, Janowitz I, Rempel DM, Robertson M, **Dennerlein JT**, Chang CH, Katz JN. A multi-method study evaluating computing-related risk factors among college students. *Work* 2007; 28:287-297. PMID: 1752245
32. Kotani K, Barrero LH, Lee DL, **Dennerlein JT**. Effect of horizontal position of the computer keyboard on upper extremity posture and muscular load during computer work. *Ergonomics* 2007; 50:1419-32. PMID: 17654034
33. Lee DL, Fleisher J, McLoone HE, Kotani K, **Dennerlein JT**. Alternative computer mouse design and testing to reduce finger extensor muscle activity during mouse use. *Hum Factors* 2007; 49:573-84. PMID: 17702210
34. Menendez CC, Amick BC 3<sup>rd</sup>, Chang CH, **Dennerlein JT**, Harrist R., Jenkins M, Robertson M, Katz JN. Computer Use Patterns Associated with Upper Extremity Musculoskeletal Symptoms. *J Occup*

*Rehabil*, 2008 18(2), 166-174. PMID: 18204927 (Open Access <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3268069/>)

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36. Oude Hengel KM, Houwink A, Odell D, van Dieën J, **Dennerlein JT**. Smaller external notebook mice have different effects on posture and muscle activity. *Clinical Biomechanics*, 2008; 23: 727–734. PMID: 18348899
37. Lee DL, Kuo P, Jindrich DJ, **Dennerlein JT**. Computer Keyswitch Force-Displacement Characteristics Affect Muscle Activity Patterns During Index Finger Tapping. *Journal of Electromyography and Kinesiology*. 2009 Oct;19(5):810-20. PMID: 18515146
38. Barrero LH, Katz JN, Perry M, Krishnan R, Ware JH, **Dennerlein JT**. Intermittent work causes bias in self-reported activity duration: Mechanisms and implications for exposure assessment and epidemiology. *Occupational and Environmental Medicine*, 2009 66(1): 38-44. PMID: 18805887 (Open Access <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3257319/>)
39. Chang CH, Johnson PW, Katz JN, Eisen EA, **Dennerlein JT**. Typing keystroke duration changed after submaximal isometric finger exercises. *European Journal of Applied Physiology*, 2009: 105(1): 93-101. PMID: 18853179 (Open Access <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3256245/>)
40. Chang CH, Johnson PW, **Dennerlein JT**. A Wide Range of Activity Duration Cutoffs Provided Unbiased Estimates of Exposure to Computer Use. *Journal of Occupational & Environmental Hygiene*, 2008; 5(12): 790-6. PMID: 18932082
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<sup>vii</sup> Won Best Student Poster -- AIHA Healthcare Working Group

<sup>viii</sup> Nominated Best Poster

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