

CURRICULUM VITAE

Date prepared: October 25, 2018

Name: Leslie R. Morse, DO

Current Position: Endowed Director of SCI Research
Craig Hospital
Clinical Associate Professor, Department of PMR, Colorado University

Office Address: 3425 South Clarkson Street
Englewood, Colorado 80113

Place of Birth: Belfast, Maine

Education

<u>Year</u>	<u>Degree</u>	<u>Field of Study</u>	<u>Institution</u>
1994	B.A.	Biochemistry and English	Bowdoin College Brunswick, Maine
2001	D.O.	Osteopathic Medicine	University of New England College of Osteopathic Medicine Biddeford, Maine

Postdoctoral Training

<u>Year</u>	<u>Title</u>	<u>Specialty</u>	<u>Institution</u>
2001-2002	Intern	Family Medicine	NH-Dartmouth Family Practice Residency Concord, New Hampshire
2002-2005	Resident	Physical Medicine and Rehabilitation	Boston Medical Center Boston, Massachusetts

Faculty Academic Appointments

<u>Year</u>	<u>Academic Title</u>	<u>Institution</u>
2005-2010	Instructor	Harvard Medical School
2010-2016	Associate Research Investigator	The Forsyth Institute, Cambridge, MA
2010-2016	Assistant Professor	Harvard Medical School, Boston, MA
2016-present	Clinical Associate Professor	University of Colorado, Denver, CO

Appointments at Hospitals

<u>Year</u>	<u>Academic Title</u>	<u>Institution</u>
2005-2016	Clinical Associate	Massachusetts General Hospital
2005-2016	Staff Physician	Spaulding Rehabilitation Hospital

Administrative Responsibilities

<u>Year</u>	<u>Academic Title</u>	<u>Institution</u>
2011-2016	Program Director	Spaulding-Harvard SCI Model System
2012-2015	Associate Director of Research	Spaulding Rehabilitation Hospital
2015-2016	Associate Chair of Academic Affairs	Spaulding Rehabilitation Hospital
2016-present	Endowed Medical Director of Research	Craig Hospital

Honors

<u>Year</u>	<u>Name of Honor</u>	<u>Awarding Organization</u>
1992	James Bowdoin Scholar Award for Academic Excellence	Bowdoin College
1993	<i>Sigma Xi</i> Research Fellowship	Mt. Sinai Medical Center, New York, NY
1993	James Bowdoin Biology Research Fellowship	Bowdoin College
2004	New Investigator Award	Foundation for PM&R
2005	Postdoctoral Travel Award	Society for Neuroscience
2006	Postdoctoral Travel Award	Serotonin Club
2007	Best Paper Award	Association of Academic Physiatrists
2008	Best Paper Award	Foundation for PMR
2008-2010	Department of PMR Fellowship	Harvard Medical School
2009	Outstanding Oral Presentation	Association of Academic Physiatrists
2009	Outstanding Poster Presentation	Association of Academic Physiatrists
2010	Best Paper Award	Association of Academic Physiatrists
2012	Young Academician Award	Association of Academic Physiatrists

Professional Societies

<u>Year</u>	<u>Society</u>	<u>Role</u>
2003-present	Association of Academic Physiatrists	Member
2009-present	International Society for Clinical Densitometry	Member
2013-present	Association of Academic Physiatrists	Member, Research Committee

Committee Service

Local

<u>Year</u>	<u>Name of Committee</u>	<u>Institution</u>
2007-2015	IRB	The Forsyth Institute
2008-2016	CME Committee	Spaulding Rehabilitation Hospital
2008-2012	IRB	Spaulding Rehabilitation Hospital
2012-2016	Boston Athletic Association	Boston Marathon Medical Committee
2013-2015	IRB Chair	Spaulding Rehabilitation Hospital
2015-2016	Faculty Promotions Committee Co-chair	Department of PMR, Harvard Medical School

National

<u>Year</u>	<u>Name of Committee</u>	<u>Organization</u>
2005-2007	Membership Committee	Association of Academic Physiatrists
2012-2014	Research Committee	Association of Academic Physiatrists 2010-
2011-2012	President, Research Council	Association of Academic Physiatrists
2011-present	Advisory Board	RMSTP K12 Program

International

<u>Year</u>	<u>Name of Committee</u>	<u>Organization</u>
2017-present	International SCI Data Sets Committee	International Spinal Cord Society

Report of Clinical Activities and Innovations

Current Licensure and Certification

Year	Type of License or Certification
2005	Massachusetts State Medical License
2006	American Board of Physical Medicine and Rehabilitation Certificate
2016	Colorado State Medical License

Editorial Activities

Ad hoc Journal Reviewer

Journal of Bone and Mineral Research
Osteoporosis International
Bone
Journal of Orthopedic Research
Archives of Physical Medicine and Rehabilitation
PMR
Journal of Cellular Biochemistry
Recent Patents on CNS Drug Discovery
Saudi Medical Journal
Journal of NeuroEngineering and Rehabilitation
American Society for Bone and Mineral Research annual meeting abstract/poster judge

Other Editorial Roles

<u>Year</u>	<u>Role</u>	<u>Journal</u>
2009-2017	Editorial Board Member	American Journal of Physical Medicine & Rehabilitation
2017-Present	Associate Editor	American Journal of Physical Medicine & Rehabilitation

Ad hoc Grant Reviewer

Department of Defense
Neilsen Foundation
Department of Veterans Affairs

Invited Teaching and Presentations

Regional

- 2006 Myofascial Pain of the Head and Neck: Facial Pain Rounds. New England Medical Center, Boston, Massachusetts
- 2007 Bone Metabolic Changes Resulting from Experimental Spinal Cord Injury. Research Seminar, West Roxbury VA Medical Center, West Roxbury, Massachusetts
- 2009 Bone Loss and Regeneration Following Severe Neurological Injury. Research Presentation, Tohoku-Forsyth Symposium, the Forsyth Institute, Cambridge, Massachusetts
- 2009 Introduction to EMG. Therapy Department, College of Health and Rehabilitation Sciences, Boston University, Boston, Massachusetts
- 2010 Introduction to EMG. Therapy Department, College of Health and Rehabilitation Sciences, Boston University, Boston, Massachusetts
- 2014 Spinal Cord Injury: Impact on the Musculoskeletal System, Men's Health Seminar Series. Brigham and Women's Hospital, Boston, Massachusetts
- 2017 Development and Use of the Exoskeleton Rehabilitation System, CU Physical Therapy 70th Anniversary Celebration, UC Denver, Aurora, Colorado
- 2017 A Night at Craig: Updates in SCI Research, Craig Hospital, Englewood, Colorado
- 2017 Morse L, Monden K, Coker JL. Innovations in SCI Research. Mountain Plains Regional Office of USDA/Food and Nutrition Service, Denver, CO

National

- 2005 Bone Remodeling Following Spinal Cord Injury in Rats: Report I-Impact of Lower Thoracic Contusion. 60th Annual Assembly of the Academy of Physical Medicine and Rehabilitation
- 2007 New Model of SCI-Induced Osteoporosis: Acute Contusion Spinal Cord Injury in Rats Triggers Rapid Bone Loss. Plenary Session, Platform Presentation. 43rd Annual Association of Academic Physiatrists Education Conference.
- 2008 Hip Osteoarthritis May Increase the Risk of Bone Loss at the Contralateral Femoral Neck. Plenary Session, Platform Presentation. 44th Annual Association of Academic Physiatrists Education Conference.
- 2009 Funding Mechanisms: Pathways to Success and Funding. Panel Discussion, 45th Annual Association of Academic Physiatrists Education Conference
- 2009 Osteocyte Apoptosis May Contribute to SCI-Induced Osteoporosis. Platform Presentation. 45th Annual Association of Academic Physiatrists Education Conference
- 2010 RMSTP Stories of Success. 46th Annual Association of Academic Physiatrists Education Conference
- 2010 Suppressed Osteoblast Proliferation and Accelerated Osteoblast Apoptosis Contribute to Uncoupled Bone Remodeling Following Spinal Cord Injury. Plenary Session Platform Presentation. 46th Annual Association of Academic Physiatrists Education Conference
- 2010 The Osteoprotective Benefits of Adiposity Vary According to Mobility Mode. Platform Presentation. 46th Annual Association of Academic Physiatrists Education Conference
- 2010 Bone Loss and Regeneration Following Severe Spinal Cord Injury, University of Rochester Department of Physical Medicine and Rehabilitation, NY
- 2011 Bone Regenerative Effects of FES-Rowing, First Annual Symposium on Regenerative Rehabilitation, McGowan Institute for Regenerative Medicine, University of Pittsburgh
- 2013 Bone Regenerative Effects of FES-Rowing, American Spinal Injury Association Annual Meeting
- 2013 Osteoporotic-Fracture Rehabilitation in the Post-Menopausal Patient, Annual Association of Academic Physiatrists Education Conference
- 2013 Point-Counterpoint: Controversial Issues in Spinal Cord Injury Management, The Academy of Spinal Cord Injury Professionals Annual Conference
- 2014 Biomarkers of SCI-induced osteoporosis and autoimmunity, Annual Association of Academic Physiatrists Education Conference, Nashville, Tennessee
- 2014 Circulating Adiponectin Levels are Negatively Associated with Bone Strength in Males with Motor Complete SCI, American Spinal Injury Association Annual Conference, San Antonio, Texas
- 2015 Alternative Funding Models Panel Discussion, Annual Association of Academic Physiatrists Education Conference, San Antonio, Texas
- 2015 TNF- α Inhibits *In Vitro* Neuronal Differentiation of Human Dental Pulp Stem Cells: Implications for SCI Stem Cell Therapy (Student Mentor), Annual Association of Academic Physiatrists Education Conference, San Antonio, Texas
- 2015 Scientific Autobiography, RMSTP Course, Annual Association of Academic Physiatrists Education Conference, San Antonio, Texas
- 2015 State of the Science: Emerging Therapies to Promote Neuro-recovery, Annual American Academy of Physical Medicine and Rehabilitation Conference, Boston, Massachusetts
- 2015 State of the Science: Improving understanding of the mechanism, diagnosis and treatment for heterotopic ossification, Annual American Academy of Physical Medicine and Rehabilitation Conference, Boston, Massachusetts
- 2015 Boston Strong: Role of Physiatrists as Key Responders to Acts of Terrorism, Annual American Academy of Physical Medicine and Rehabilitation Conference, Boston, Massachusetts
- 2015 Skeletal Impact of Spinal Cord Injury, Johns Hopkins Medical School Department of Physical Medicine and Rehabilitation, Baltimore, Maryland
- 2015 Skeletal Impact of Spinal Cord Injury, Craig Hospital, Colorado

- 2015 Skeletal Impact of Spinal Cord Injury, Grand Rounds, Department of Neurosurgery, University of Louisville, Kentucky
- 2015 Skeletal Impact of Spinal Cord Injury, Panther Rehab Grand Rounds, Department of Physical Medicine and Rehabilitation, University of Pittsburgh, Pennsylvania
- 2016 Bone Health Considerations: The Female Paralympic Athlete, American Congress of Sports Medicine Annual Conference, Boston, Massachusetts
- 2016 Developing and Building the Evidence Base is a Team Effort: How Healthcare Leadership Can Support Research, Career Advancement and Leadership Skills for Women in Healthcare, Harvard CME Course, Boston, Massachusetts
- 2017 Skeletal Impact of Spinal Cord Injury, Keynote Address, South Carolina Spinal Cord Injury Research Fund Scientific Conference, Charleston, South Carolina
- 2017 Skeletal Impact of Spinal Cord Injury, Grand Rounds, Department of Physical Medicine and Rehabilitation, Sidney Kimmel Medical College at Thomas Jefferson University, Philadelphia, Pennsylvania
- 2017 Circulating PAMM, A Novel Antioxidant and Ant-inflammatory Protein, is a Potential Biomarker of Injury Severity after Acute SCI, Oral Presentation, American Spinal Injury Association Annual Conference, Albuquerque, New Mexico
- 2017 Updates in SCI Research, Insurance Rehabilitation Study Group Spring Conference, Oral Presentation, Ft. Lauderdale, Florida
- 2017 Spinal Cord Injury Research: Dental Pulp Stem Cell Therapy and Osteoporosis, Oral Presentation, St. Joseph Medical Center, Kansas City, Missouri
- 2018 Spinal Cord Injury Research: Dental Pulp Stem Cell Therapy and Osteoporosis, Oral Presentation, Arkansas Trauma Conference, Hot Springs, Arkansas
- 2018 Skeletal Impact of Spinal Cord Injury, Webinar, South Carolina Spinal Cord Injury Association
- 2018 Lipoxin A4 and Resolvin D1 Preserve Neural Inductive Capacity of Dental Pulp Stem Cells Cultured under Inflammatory Conditions: Implications for SCI Stem Cell Therapy, Oral Presentation, American Spinal Injury Association Annual Conference, Rochester, Minnesota
- 2018 Dietary and supplementation needs for people with spinal cord injury, Interdisciplinary Workshop, Academy of Spinal Cord Injury Professionals, Inc., New Orleans, Louisiana.

International

- 2008 Treatment of Sublesional Osteoporosis after SCI: Current Evidence, Practice Patterns, Outcome Measures & Novel Therapies. ACRM-ASNR Joint Educational Conference, Toronto, Canada
- 2010 Research Methodologies: Methods to study osteoclast differentiation and function. Postgraduate Course (M.S. and PhD) in Pediatric Dentistry and Periodontics. Dental School, University of Sao Paulo, Brazil
- 2011 Research Methodologies: Methods to study osteoclast differentiation and function. Postgraduate Course (M.S. and PhD) in Pediatric Dentistry and Periodontics. Dental School, University of Sao Paulo, Brazil
- 2012 Research Methodologies: Methods to study osteoclast differentiation and function. Postgraduate Course (M.S. and PhD) in Pediatric Dentistry and Periodontics. Dental School, University of Sao Paulo, Brazil
- 2013 Research Methodologies: Methods to study osteoclast differentiation and function. Postgraduate Course (M.S. and PhD) in Pediatric Dentistry and Periodontics. Dental School, University of Sao Paulo, Brazil.
- 2013 Statins May Prevent Longitudinal Bone Loss at the Knee in Chronic SCI, 52nd Annual Meeting of the International Spinal Cord Society, Istanbul, Turkey.

- 2014 Neuroregenerative properties of dental pulp stem cells and their future potential use to improve neurological outcomes in SCI. Postgraduate Course (M.S. and PhD) in Pediatric Dentistry and Periodontics. Dental School, University of Sao Paulo, Brazil.
- 2016 Bone Health Considerations: The Female Paralympic Athlete, International Convention on Science, Education and Medicine in Sport, Santos, Brazil.
- 2018 The Discriminative Ability of FRAX to Identify Prevalent Post-SCI Lower Extremity Osteoporotic Fractures, Oral Presentation, 12th World Congress of the International Society of Physical and Rehabilitation Medicine, Paris, France.
- 2018 Bisphosphonate use is associated with lower levels of the bone-derived hormone osteocalcin in men with spinal cord injury, Oral Presentation, 57th Annual Meeting of the International Spinal Cord Society, Sydney, Australia.

Report of Local Teaching and Training

Teaching of Students in Courses

Year	Course Title	Type of Student	Role in Course
2008	HMS PDII OSCE	HMS	Examiner
2008	HST OSCE	HST	Examiner
2009	HST OSCE	HST	Examiner

Formal Teaching of Residents, Clinical Fellows and Research Fellows

Year	Title	Type of Student	Level of Effort
2006	Boston Medical Center EMG Rotation	PMR Resident	4 hours/week
2007	Boston Medical Center EMG Rotation	PMR Resident	4 hours/week
2008	Boston Medical Center EMG Rotation	PMR Resident	4 hours/week

Laboratory and Other Research Supervisory and Training Responsibilities

Year	Role	Level of Effort
2005-present	Research Supervisor	daily mentorship for 2-3 months/trainee

Formally Supervised Trainees

Year	Name and Degrees	Current Position
2004	David Meguerdichian, MD	Instructor in Medicine, Brigham and Women's Hospital
2006	Robert Holland, MD	Physiatrist, Staten Island Rehabilitation, NY
2006	Jose Mena, MD	Physiatrist, The University of Miami
2007-2008	Bethlehem Solomon	Epidemiologist, Decision Resources Group, Bristol-Myers Squibb Team
2007	Andrew Geller, MD	Associate Professor, PMR, Emory University SOM
2007	Jessica Bell, DO	Physiatrist, Midcoast Osteopathic, Topsham, ME
2008	Lara Boyle	MD/PhD candidate, Columbia University
2008	Caresse Spencer, MD	Critical Care Medicine Fellow, Emory University SOM
2009	Reza Entezarion, DMD	Dentist, Crown Isle Dental, British Columbia, Canada
2010	*Jordan Silverman, MD	Faculty of Medicine, University of Toronto
2010	Ariane Zamarioli, PhD	Faculty of Biomechanics and Rehabilitation, University of Sao Paulo, Ribeirao Preto, Brazil
2011	Kadir Carruthers, MD	Resident, PMR, University of Pittsburgh SOM
2011	Elizabeth Beck, MD	Physiatrist, Courage Kenny Rehabilitation Associates, Minneapolis, MN
2012	*Cheri Blauwet, MD	Instructor, Department of PMR, Harvard Medical School
2012	Jonah Saltzman	Undergraduate, Harvard University
2012	*Jayne Donovan, MD	Instructor, Department of PMR, Harvard Medical School
2012	Kimberly Seidel, MD	Resident, PMR, Mayo Clinic
2014	Mary Iaccarino, MD	Instructor, Department of PMR, Harvard Medical School

2015	*Kathy Chou	Medical Student, Rowan University School of Osteopathic Medicine, Stratford, NJ
2017-2018	*Andrew Park	Resident, PMR, UC Denver SOM

*Indicates Best Paper Award recipient for project mentored in Morse lab.

Local Invited Presentations

- 2006 Role of Neuro-Osteogenic Interactions in SCI-Induced Osteoporosis. Research Seminar, Department of PMR, HMS
- 2007 Bone Loss Following Spinal Cord Injury; Not Your Mother's Osteoporosis. Grand Rounds, Department of PMR, HMS
- 2009 Osteoporosis and Growth Plate Abnormalities Following Spinal Cord Injury. Research Presentation, Partners PMR Day. Department of PMR, HMS
- 2010 SCI-Induced Osteoporosis: Impact of Spinal Cord Injury on the Bone Microenvironment. CIMIT Forum, Brigham and Women's Hospital
- 2013 Bone Health in SCI. Resident Education Seminar, Department of Physical Medicine and Rehabilitation, Harvard Medical School, Boston, Massachusetts
- 2014 Building New Models of Care: SCI, TBI, and Burn Injury Rehabilitation. The Ralph and Irene Epstein Rosenthal Memorial Lecture, Department of PMR, HMS.
- 2015 Advances in Heterotopic Ossification: A Review of Current Research and Development of a Risk Scoring. Grand Rounds, Department of Physical Medicine and Rehabilitation, Harvard Medical School, Boston, Massachusetts
- 2015 Dental Pulp Stem Cells Promote Neurorecovery in a Rodent Model of Spinal Cord Injury, Gordon Center Research and Education Day, Spaulding Rehabilitation Hospital, Boston, Massachusetts
- 2016 Bone Health in SCI. Resident Education Seminar, Department of Physical Medicine and Rehabilitation, Harvard Medical School, Boston, Massachusetts
- 2017 Skeletal Impact of Spinal Cord Injury, Grand Rounds, Department of Physical Medicine and Rehabilitation, UC Denver, Colorado

Grant Support

Current Funding

- 2018-2021 Assistive Technology and Functional Outcomes following Spinal Cord Injury (Monden PI)
Department of Defense SCI170159 (\$638,000)
Role: Co-investigator
The aims of this study are to: (1) examine perceived barriers to or facilitators of assistive technology (AT) access and utilization and the impact on functional and psychosocial outcomes after tetraplegia, (2) assess for variations in use of AT across insurance providers and socioeconomic status in Veterans and civilians with tetraplegia, (3) assess the relationship between AT use and productivity (employment/school), and (4) assess the relationship between AT and psychosocial outcomes.
- 2016-2021 Re-Inventing Yourself after Spinal Cord Injury: A Multi-Site Randomize Controlled Trial of an Intervention to Improve Outcomes after Spinal Cord Injury
NIDILRR, Department of Health and Human Services (Charlifue PI, \$2,478,780)
Role: Consultant
The aims of this study are to: (1) The goal of this study is to test the an intervention to help individuals with SCI build skills that help them adapt to the stresses associated with a chronic physical disability, alleviate the consequences of anxiety and depression, and enhance subjective well-being.

- 2016-2021 Rocky Mountain Regional Spinal Injury System
90SI5015-01-00
NIDILRR, Department of Health and Human Services (\$2,415,292)
Role: Co-Project Director
The goals of this project are to (1) harness our existing multidisciplinary system of rehabilitation care designed specifically to meet the needs of individuals with SCI to extend the Model Systems knowledge base, (2) contribute to improving long term SCI outcomes through participation in site-specific and collaborative clinical trials and research projects, (3) contribute to the SCI model systems national database through longitudinal assessment of long term SCI outcomes, (4) Contribute to improved long term SCI outcomes by conducting a research project designed to reduce sublesional neuropathic pain following SCI.
- 2016-2021 Lifestyle intervention targeting enhanced health and function for persons with chronic SCI in caregiver/care-receiver relationships: effects of caregiver co-treatment
H133A150065 (Nash PI)
NIDILRR, Department of Health and Human Services
Role: Co-investigator
The goals of this project are to: 1) determine the efficacy of a lifestyle intervention to improve health and function of individuals with SCI.
- 2015-2020 Effects of Ekso-assisted gait training on Bone Health and Quality of Life: A Randomized Clinical Trial
Department of Defense W81XWH-14-SCIRP-CTA (\$2,478,827)
Role: PI
The goals of this project are to 1) determine whether exoskeleton-assisted gait training increases bone strength in the paralyzed lower extremity and 2) determine whether exoskeleton-assisted gait training improves quality of life after SCI. Secondly, to determine whether gait training improves the following related outcomes and mediators of quality of life: mood, pain, and cortical activity of related emotional networks in the brain.
- 2015-2020 R01 AR064793-01A1 (Battaglino PI)
NIH/NIAMS
Role: Co-investigator
Regulation of gastric and osteoclast acidification by Snx10
The specific aims to be addressed in this project are: 1) Determine the cellular mechanisms by which Snx10 regulates osteoclast function. 2) Determine the role of osteoclastic expression of Snx10 on bone homeostasis *in vivo*. 3) Determine the whole of gastric expression of Snx10 on bone homeostasis *in vivo*.

Past Funding

Years

Grant title

Grant type and number

Role on project (total direct costs)

Description of the major goals

- 2014-2015 Skeletal and Clinical Effects of Exoskeleton Assisted Gait
Department of Defense SC130295 (Bonato, Morse, Troy Co-PI, \$379,188)
Role: Co-PI
The goals of this project are to quantify the kinematics and kinetics, and loads on lower limb bones during ambulation using an exoskeleton system
- 2013-2016 Hybrid-FES Exercise to Prevent Cardiovascular Declines in Acute Spinal Cord Injury

NIH/ NHLBI R01HL117037-01A1 (Taylor PI)

Role: Co-Investigator

The major goals of this project is to examine the impact of a 6 month FES-RT intervention on key metrics of exercise capacity and to characterize changes in myocardial structure and function that accompany 6 months of FES-RT; and to quantify changes in key indices of cardiovascular health and control with FES-RT; and to document alterations in body composition and insulin sensitivity resulting from FES-RT.

2013-2016 Vitamin D, Respiratory Function, and Illness in Chronic SCI
VA Rehabilitation R&D Merit Review RX000792 (Garshick PI)

Role: Co-Investigator

The goal of this study was to longitudinally assess the relationship between vitamin D levels, pulmonary function, and the risk of future chest illness.

2013-2015 Dental Pulp Stem Cells to Promote Neuroregeneration
The Gordon Foundation (\$308,362)

Role: PI

The goal of this study is to study the differentiation potential of dental pulp stem cells *in vitro*, and to determine the impact of cell transplantation on neurological recovery in a rodent model of contusion SCI.

2013-2015 Boston Marathon Bombing Study
Craig H. Neilsen Foundation (\$292,050)

Role: PI

The goal of this study is to determine factors associated with functional outcome, quality of life, return to work, and psychiatric complications in survivors of the Boston Marathon Bombing.

2012-2014 Determinants of Telomere Length in Chronic SCI: A Pilot Study
VA Rehabilitation R&D Merit Review Pilot (Garshick PI)

Role: Co-Investigator

Telomeres are made up of repeat sequences of nucleotides at the ends of human chromosomes. By using telomere length as a molecular biomarker, it is proposed to study spinal cord injury as a disease state that promotes accelerated aging at the cellular level. It is hypothesized that greater central obesity determined by DXA scan and greater systemic inflammation assessed by plasma C-reactive protein and interleukin-6 will be associated with shorter telomere length, and that persons with shorter telomere length will have reduced pulmonary function. This project will obtain data regarding these associations in 350 persons with chronic SCI.

2012-2013 Cardiac Atrophy and Exercise-Induced Cardiac Remodeling in Chronic SCI
Center for Integration of Medicine and Innovative Technology (CIMIT) (\$50,000)

Role: PI

The goals of this project are to (1) determine the extent of myocardial atrophy, functional cardiac deterioration, and impaired exercise capacity in subjects with motor complete thoracic SCI, (2) determine the myocardial response to repetitive FES-RT in subjects with motor complete thoracic SCI, and (3) examine the impact of FES-RT on exercise capacity and to determine the relationships between improved exercise capacity and cardiovascular adaptations in subjects with motor complete thoracic SCI who perform FES-RT.

2011-2016 Spaulding Harvard Spinal Cord Injury Model System
NIDILRR, Department of Health and Human Services 90SI5007-02-02 (\$3,437,517)

Role: Project Director

The goals of this project are to (1) harness our existing multidisciplinary system of rehabilitation

care designed specifically to meet the needs of individuals with SCI to extend the Model Systems knowledge base, (2) contribute to improving long term SCI outcomes through participation in site-specific and collaborative clinical trials and research projects, (3) contribute to the SCI model systems national database through longitudinal assessment of long term SCI outcomes, (4) Contribute to improved long term SCI outcomes by conducting a research project designed to reduce sublesional neuropathic pain following SCI and (5) continue to refine our extensive program of dissemination of clinical and research findings related to SCI.

2010-2016 Adiposity and Bone Loss in Spinal Cord Injury
NIH/NIAMS 1R01AR059270-01 (\$3,615,279)
Role: PI

The goals of this project are to (1) determine the degree of bone formation, bone resorption, and rate of bone loss longitudinally at the distal femur and proximal tibia in 300 subjects with chronic SCI with varying degrees of neurologic impairment and in 50 able-bodied subjects, (2) determine the relationship between regional fat distribution assessed directly from DXA scan data and longitudinal change in BMD at the distal femur and proximal tibia, and (3) assess the relationship between circulating levels of adipose derived hormones (leptin and adiponectin) with bone loss at the distal femur and proximal tibia.

2010-2016 FES-Rowing versus Zoledronic Acid to Improve Bone Health in SCI: A Comparative Clinical Trial
Department of Defense W81XWH-10-1-1043 (\$2,128,759)
Role: PI

The goals of this project are to (1) compare the effect of FES-row training alone versus FES-rowing plus Zoledronic Acid on bone density of the paralyzed lower extremity and (2) compare the effect of FES-row training alone versus FES-rowing plus Zoledronic Acid on bone micro architecture of the paralyzed lower extremity.

2009-2013 Brain Plasticity in Carpal Tunnel Syndrome and Its Response to Acupuncture
NIH/NCCAM 5R01AT004714-02 (Napadow PI)
Role: Co-investigator

The goals of this project are to (1) develop and optimize functional MRI (fMRI) neuroimaging biomarkers for CTS and correlate these biomarkers with more established peripheral clinical and functional deficit metrics (2) evaluate brain response to acupuncture at both local and distal acupoints in CTS patients, and correlate activity in specific limbic brain regions and the primary sensorimotor cortex with peripheral clinical pathophysiology and SI digit somatotopy, and (3) investigate the immediate and longitudinal response in central biomarkers to acupuncture therapy.

2009–2012 Respiratory Function, Mobility, and Systemic Inflammation in Chronic SCI (Garshick PI)
VA Rehabilitation Merit Review B6618R
Role: Co-Investigator

The goals of this project are to (1) define the cross-sectional association between circulating markers of systemic inflammation (C-reactive protein; CRP and interleukin-6; IL-6) and forced expiratory volume in one second (FEV₁) and forced vital capacity (FVC) in chronic SCI; (2) define clinical factors associated with circulating markers of systemic inflammation (CRP and IL-6), including mobility mode (i.e., motorized and hand-propelled wheelchair use), leisure time and other physical activity, level and completeness of SCI, BMI, urinary tract infection, mode of urination, and current or recent skin ulcers, and (3) assess relationships between reduced pulmonary function and cardiovascular and overall mortality between 1994 and 2007.

2009-2011 Bone Density and Circulating Mediators of Bone Metabolism in Chronic SCI

NIH/NICHD 3R21HD057030-02S1 (\$136,902)

Role: PI

The goals of this project are to (1) assess longitudinal change in BMD in 40 persons with chronic SCI and 10 able-bodied persons previously studied in year 1 of the parent grant, (2) assess the relationship between regional fat distribution and longitudinal change per year in BMD, and (3) assess the relationship between circulating levels of adipose derived hormones (leptin, adiponectin, Interleukin-6 (IL-6), and Tumor Necrosis Factor) with loss of BMD at the distal femur and proximal tibia, and (4) use microarray technology to compare gene expression profiles of circulating osteoclast precursors to identify metabolic pathways and specific genes modulating ongoing bone loss in chronic SCI.

2008-2011 Bone Density and Circulating Mediators of Bone Metabolism in Chronic SCI
NIH/NICHD R21 HD057030A (\$438,450)

Role: PI

The goals of this project are to determine the effect of injury level and severity on bone mineral density (BMD) at non-traditional skeletal sites (distal femur and proximal tibia) in chronic SCI and to determine the relationship between bone mineral density (BMD) at the distal femur and proximal tibia, markers of bone turnover, and circulating levels of the RANKL/OPG pathway.

2007-2008 Assessment of Osteoporosis in Chronic Spinal Cord Injury (Garshick PI)
Department of Veterans Affairs Health Services R&D Service

Role: Co-Investigator

The goals of this project were to identify risk factors for fracture-related hospitalization in 315 veterans with SCI, use an internet-based survey to assess current practice patterns regarding the diagnosis and treatment of osteoporosis in the VHA nationally, and review best practices suggested by the literature, and since DXA scanners are designed for use in the able-bodied, assess physical barriers to providing DXA scan services, and the precision of bone mineral density (BMD) data obtained in SCI.

2005-2008 Investigation of Neuro-Osteogenic Interactions Following Spinal Cord Injury
NIH/NICHD K12 HD001097-08 (White PI)

Role: Career Development Award Recipient

The goals of this project are to determine the effect of bone denervation in humans on the osteoclastogenic potential of circulating preosteoclasts, to assess the role of neuropeptide modulation of osteoclastic bone resorption following spinal cord injury and to determine by microarray analysis the changes in circulating preosteoclast gene expression due to bone denervation following spinal cord injury.

2004-2005 Assay of Known Modulators of Bone Metabolism and their Relation to Bone Mineral Density
Following Acute Spinal Cord Injury
Foundation for PMR (\$10,000)

Role: PI

The goals of this project were to identify determinants of circulating RANKL and OPG levels in patients with spinal cord injury.

Report of Scholarship

Publications

1. **Morse L**, Chen D, Franklin D, Xiong Y, Chen-Kiang S. Induction of cell cycle arrest and B cell terminal differentiation by CDK inhibitor p18 and IL-6. *Immunity* 1997; 6:47-56.

2. Burke DT, Hoberman C, **Morse LR**, Pina B. A new procedure for gastrostomy tube replacement verification: A case report. *Arch Phys Med Rehab* 2005; 86:1484-1486.
3. Schinchuk L, **Morse L**, Huanchahuari N, Arum S, Chen T, Holick M. Vitamin D deficiency and metabolic bone disease in rehabilitation inpatients. *Arch Phys Med Rehabil* 2006; 87:904-908.
4. Pham L, Purcell P, **Morse L**, Stashenko P, Battaglini RA. Expression analysis of nha-oc/NHA2: a novel osteoclast-specific gene. *Gene Expr Patterns* 2007; 7:846-851.
5. Battaglini RA, Pham L, **Morse LR**, Vokes M, Sharma A, Odgren P, Sasaki H, Stashenko P. NHA-oc/NHA2: a mitochondrial cation-proton Antiporter selectively expressed in osteoclasts. *Bone* 2008;42:180-192.
6. **Morse LR**, Stolzmann K, Nguyen H, Jain N, Zayac C, Gagnon D, Tun C, Garshick E. Association between mobility mode and C-reactive protein levels in men with chronic spinal cord injury. *Arch Phys Med Rehab* 2008;89:726-731.
7. **Morse LR**, Nyugen H, Jain N, Williams W, Tun C, Battaglini R, Stashenko P, Garshick E. Age and motor score predict osteoprotegerin levels in chronic SCI. *J of Musculoskeletal Interactions* 2008; 8:50-57.
8. **Morse L**, Teng Y, Newton K, Du Y, Liao W, Kohler T, Mueller R, Graves D, Stashenko P, Battaglini RA. Spinal cord injury causes rapid osteoclastic resorption and growth plate abnormalities in growing rats. *Osteoporos Int* 2008; 19:645-652.
9. **Morse LR**, Stolzmann K, Hallett L, Waddimba A, Gagnon D, Lazzari A, Garshick E. Osteoporotic fractures and hospitalization risk in chronic spinal cord injury. *Osteoporos Int* 2009; 20:385-392.
10. **Morse LR**, Geller A, Stolzmann K, Matthes K, Lazzari A, Garshick E. Barriers to providing dual energy X-ray absorptiometry services to individuals with spinal cord injury. *Am J Phys Med Rehabil* 2009; 88:57-60.
11. **Morse LR**, Giangregori L, Battaglini RA, Holland R, Craven BC, Stolzmann K, Lazzari A, Sabharwal S, Garshick E. VA based survey of osteoporosis management in spinal cord injury. *PM&R* 2009; 1:240-244.
12. **Morse LR**, Lazzari A, Battaglini RA, Stolzmann K, Matthes K, Gagnon D, Davis S, Garshick E. Dual energy X-Ray absorptiometry of the distal femur may be more reliable than the proximal tibia in spinal cord injury. *Arch Phys Med Rehabil* 2009; 90:827-831.
13. Xu Y, Young M, Battaglini RA, **Morse LR**, Fontana CR, Pagonis TC, Kent R, Stashenko P, Soukos NS. Endodontic antimicrobial photodynamic therapy: Assessment of safety on fibroblasts and osteoblasts in vitro. *J Endod.* 2009 Nov;35(11):1567-72.
14. Xu Y*, **Morse LR***, da Silva R, Odgren PR, Sasaki H, Stashenko P, Battaglini RA. PAMM: A redox regulatory protein that modulates osteoclast differentiation. *Antioxid Redox Signal.* 2010 Jul 1;13(1):27-37. * The first 2 authors contributed equally to this work.
15. Sasaki H, Suzuki N, Alshwaimi E, Xu Y, Battaglini R, **Morse L**, Stashenko P. 18beta-Glycyrrhetic acid inhibits periodontitis via glucocorticoid-independent nuclear factor-kappaB inactivation in interleukin-10-deficient mice. *J Periodontal Res.* 2010 Dec;45(6):757-63.
16. Huang X, **Morse LR**, Xu Y, Zahradka J, Sychrová H, Stashenko P, Fan F, Battaglini RA. Mutational analysis of NHAoc/NHA2 in *Saccharomyces cerevisiae*. *Biochim Biophys Acta.* 2010 Dec;1800(12):1241-7.
17. Garshick E, Stolzmann KL, Gagnon DR, **Morse LR**, Brown R. Systemic Inflammation and Reduced Pulmonary Function in Chronic Spinal Cord Injury. *PM R.* 2011 May;3(5):433-9.
18. **Morse LR**, Xu Y, Solomon B, Bolye L, Yoganathan S, Stashenko P, Battaglini R. Severe Spinal Cord Injury Causes Immediate Multi-cellular Dysfunction at the Chondro-Osseous Junction. *Transl. Stroke Res.* 2011 Dec 1;2(4):643-650.
19. Zhu C, **Morse LR**, Battaglini R. SNX10 is required for osteoclast formation and resorption activity. *Journal of Cellular Biochemistry,* 2012 May;113(5):1608-15.
20. **Morse LR**, Sudhakar S, Danilack V, Tun C, Lazzari AA, Gagnon D, Garshick E, Battaglini RA. Association between Sclerostin and Bone Density in Chronic SCI. *J Bone Miner Res.* 2012 Feb;27(2):352-9.

21. Nelson-Filho P, Lucisano MP, Da Silva RA, Da Silva RS, Serra MC, Gerlach RF, Neto FC, Carneiro ZA, Zamarioli A, **Morse L**, Battaglino R. Systemically alendronate was incorporated into dental tissues but did not cause morphological or mechanical changes in rats teeth. *Microsc Res Tech*. 2012 Sep;75(9):1265-71.
22. Battaglino RA, Sudhakar S, Tun C, Lazzari AA, Garshick E, Zafonte R, **Morse LR**. Circulating sclerostin is elevated in short-term and reduced in long-term SCI. *Bone*. 2012. Sep;51(3):600-5.
23. **Morse LR**, Sudhakar S, Lazzari AA, Tun C, Garshick E, Zafonte R, Battaglino RA. Sclerostin: A Candidate Biomarker of SCI-induced Osteoporosis. *Osteoporosis International*. 2013 Mar;24(3):961-8.
24. Dhond R, Ruzich E, Witzel T, Maeda Y, Malatesta C, **Morse LR**, Audette J, Hamalainen M, Kettner N, Napadow V. Spatiotemporal Mapping Cortical Neuroplasticity in Carpal Tunnel Syndrome. *Brain*. 2012 Oct;135(Pt 10):3062-73.
25. Battaglino RA, Lazzari A, Garshick E, **Morse LR**. Spinal Cord Injury-Induced Osteoporosis: Pathogenesis and Emerging Therapies. *Curr Osteoporos Rep*. 2012 Dec;10(4):278-85.
26. Saltzman J, Battaglino RA, Salles L, Jha P, Sudhakar S, Garshick E, Stott HL, Zafonte R, **Morse LR**. BCMA, APRIL and BAFF are candidate mediators of SCI-induced autoimmunity. *J Neurotrauma*. 2013 Mar 15;30(6):434-40.
27. Zamarioli A, Battaglino R, **Morse LR**, Sudhakar S, Maranhão D, Okubo R, Volpon J, Shimano A. Standing Frame and Electrical Stimulation Therapies Partially Preserve Bone Strength in a Rodent Model of Acute Spinal Cord Injury. *Am J Phys Med Rehabil*. 2013 May;92(5):402-10.
28. Blauwet C, Sudhakar S, Doherty A, Garshick E, Zafonte R, **Morse LR**. Participation in Organized Sports is Positively Associated with Employment in Adults with Spinal Cord Injury. *Am J Phys Med Rehabil*. 2013 May;92(5):393-401.
29. Moreno-Duarte I, **Morse LR**, Alam M, Bikson M, Zafonte R, Fregni F. Targeted neuromodulation for the treatment of chronic pain in spinal cord injury. *NeuroImage*, 2013 May 30. pii: S1053-8119(13)00599-5.
30. Lucisano MP, Nelson-Filho P, **Morse L**, Battaglino R, Watanabe PC, da Silva RA, da Silva LA. Radiodensitometric and DXA analyses for the measurement of bone mineral density after systemic alendronate therapy. *Braz Oral Res*. 2013;27(3). pii: S1806-83242013000300252.
31. Maeda Y, Kettner N, Sheehan J, Kim J, Cina S, Malatesta C, Gerber J, McManus C, Mezzacappa P, **Morse LR**, Audette J, Napadow V. Altered brain morphometry in carpal tunnel syndrome is associated with median nerve pathology. *NeuroImage: Clinical. Neuroimage (Amst)*. 2013;2:313-319.
32. Maeda Y, Kettner N, Lee J, Kim J, Cina S, Malatesta C, Gerber J, McManus C, Im J, Libby A, Mezzacappa P, **Morse LR**, Park K, Audette J, Napadow V. Acupuncture evoked response in contralateral somatosensory cortex reflects peripheral nerve pathology of carpal tunnel syndrome. *Medical Acupuncture*, 2013 Aug;25(4):275-284.
33. Maeda Y, Kettner N, Lee J, Kim J, Cina S, Malatesta C, Gerber J, McManus C, Im J, Libby A, Mezzacappa P, **Morse LR**, Park K, Audette J, Napadow V. Acupuncture evoked response in somatosensory and prefrontal cortices predicts immediate pain reduction in carpal tunnel syndrome. *Evid Based Complement Alternat Med*. 2013;2013:795906. Epub 2013 Jun17.
34. Tan C, Battaglino R, **Morse LR**. Spinal Cord Injury and Osteoporosis: Causes, Mechanisms, and Rehabilitation Strategies. *Int J Phys Med Rehabil* 2013,1:27.
35. Saltzman J, Battaglino RA, Stott HL, **Morse LR**. Neurotoxic or Neuroprotective? Current Controversies in SCI-Induced Autoimmunity. *Curr Phys Med Rehabil Rep* (2013) 1:174–177.
36. Choi E, Carruthers K, Zhang L, Thomas N, Battaglino RA, **Morse LR**, Widrick JJ. Concurrent muscle and bone deterioration in a murine model of cancer cachexia. *Physiological Reports*, 2013 Nov;1(6):e00144.
37. Ye L, **Morse LR**, Battaglino RA. Snx10: a newly identified locus associated with human osteopetrosis. *IBMS BoneKEy*. 2013(10). pii: 421.
38. Danilack V, Stolzmann KL, Gagnon DR, Brown R, Tun C, **Morse LR**, Garshick E. Associations with Chest Illness and Mortality in Chronic Spinal Cord Injury. *J Spinal Cord Med*. 2014 Nov;37(6):662-9.

39. Doherty A, Battaglino R, Donovan J, Gagnon D, Lazzari A, Garshick E, Zafonte R, **Morse LR**. Adiponectin is a candidate biomarker of lower extremity bone density in men with chronic spinal cord injury. *J Bone Miner Res*. 2014 Jan;29(1):251-9.
40. Maeda Y, Kettner N, Holden J, Lee J, Kim J, Cina S, Malatesta C, Gerber J, McManus C, Im J, Libby A, Mezzacappa P, **Morse LR**, Park K, Audette J, Tommerdahl M, Napadow V. Functional deficits in carpal tunnel syndrome reflect reorganization of primary somatosensory cortex. *Brain*. 2014 Jun;137(Pt 6):1741-52.
41. Taylor JA, Picard G, Porter A, **Morse LR**, Pronovost M, Deley G. Hybrid FES exercise training alters the relationship between spinal cord injury level and aerobic capacity. *Arch Phys Med Rehabil*. 2014 Nov;95(11):2172-9.
42. Tan C, Battaglino R, Doherty A, Gupta R, Lazzari A, Garshick E, Zafonte R, **Morse LR**. Adiponectin is Associated with Bone Strength and Fracture History in Paralyzed Men with Spinal Cord Injury. *Osteoporos Int*. 2014 Nov;25(11):2599-607.
43. Ye L, **Morse LR**, Zhang L, Sasaki H, Mills J, Odgren P, Sibbel G, Zamarioli A, Battaglino RA. Osteopetrorickets due to Snx10 deficiency in mice results from both failed osteoclast activity and loss of gastric acid-dependent calcium absorption. *PLoS Genet*. 2015 Mar 26;11(3):e1005057.
44. Jette AM, Slavin MD, Ni P, Kisala PA, Tulskey DS, Heinemann AW, Charlifue S, Tate DG, Fyffe D, **Morse L**, Marino R, Smith I, Williams S. Development and initial evaluation of the SCI-FI/AT. *J Spinal Cord Med*. 2015 May;38(3):409-418.
45. Jain NB, Ayers GD, Harris MB, **Morse L**, O'Connor, Garshick E. Traumatic Spinal Cord Injury in the United States, 1993-2012. *JAMA*. 2015 Jun 9;313(22):2236-43.
46. Troy K, **Morse LR**. Measurement of Bone: Diagnosis of SCI-induced Osteoporosis and Fracture Risk Prediction. *Top Spinal Cord Inj Rehabil*. 2015;21(4):267-274.
47. Gou F, Fu Z, Huang S, Chen T, Papasian C, **Morse LR**, Xu Y, Battaglino RA, Yang X, Jiang Z, Xin H, Fu M. Adipocyte-derived PAMM Suppresses Macrophage Inflammation by Inhibiting MAPK Signaling. *Biochem J*. 2015 Oct 5.
48. Xu Y; **Morse LR**; Bezerra da Silva R; Wang D, Battaglino RA. A Short Report: PAMM, a Novel Antioxidant Protein, Induced by Oxidative Stress. *Redox Biol*. 2015 Sep 21;6:446-453.
49. Fernandes Marcondes B, Amaris A, Nery F, Doherty A, Brandao R, Tate D, Zafonte R, DO, **Morse L**, Fregni F. Pain Severity and Mobility One Year after Spinal Cord Injury. *European Journal of Physical and Rehabilitation Medicine*. 2015 Nov 27.
50. Hart J, **Morse LR**, Tun C, Brown R, Garshick E. Cross-sectional associations of pulmonary function with systemic inflammation and oxidative stress in individuals with chronic spinal cord injury. *J Spinal Cord Med*. 2016 May;39(3):344-52
51. Maeda Y, Kettner N, Kim J, Kim H, Cina S, Malatesta C, Gerber J, McManus C, Libby A, Mezzacappa P, Mawla I, **Morse L**, Park K, Audette J, Napadow V. Primary somatosensory/motor cortical thickness distinguishes paresthesia- from pain-dominant carpal tunnel syndrome. *Pain*. 2016 May;157(5):1085-93.
52. Garshick E, Mulroy S, Graves D, Greenwald K, Horton J, **Morse L**. An Active Lifestyle Is Associated With Reduced Dyspnea and Greater Life Satisfaction in Spinal Cord Injury. *Arch Phys Med Rehabil*. 2016 Mar 4. pii: S0003-9993(16)00149-0.
53. Marino R, Schmidt-Read M, Kirshblum S, Dyson-Hudson T, Tansey K, **Morse LR**, Graves D. Reliability and validity of S3 pressure sensation as an alternative to deep anal pressure in neurological classification of persons with spinal cord injury. *Arch Phys Med Rehabil*. 2016 Feb 24.
54. Slavin M, Ni P, Tulskey D, Kisala P, Heinemann A, Charlifue S, Fyffe D, Graves D, Marino R, **Morse LR**, Rosenblum D, Tate D, Worobey L, Dawson M, Jette A. The Spinal Cord Injury-Functional Index/Assistive Technology (SCI-FI/AT) Short Forms. *Arch Phys Med Rehabil*. 2016 Oct;97(10):1745-1752.
55. **Morse LR**, Nguyen N, Battaglino RA, Guarino AJ, Gagnon D, Zafonte R, Garshick E. Wheelchair use and Lipophilic Statin Medications May Influence Bone Loss in Chronic Spinal Cord Injury: Findings from the FRASCI Study. *Osteoporos Int*. 2016 Dec;27(12):3503-3511. PubMed PMID: 27412619.

56. Maeda Y, Kim H, Kettner N, Kim J, Cina S, Malatesta C, Gerber J, McManus C, Ong-Sutherland R, Mezzacappa P, Mawla I, **Morse LR**, Kaptchuk T, Audette J, Napadow V. Rewiring the primary somatosensory cortex in carpal tunnel syndrome with acupuncture. *Brain*. 2017 Apr 1;140(4):914-927
57. Fang Y, **Morse LR**, Nguyen N, Tsantes NG, Troy KL. Anthropometric and Biomechanical Characteristics of Body Segments in Persons with Spinal Cord Injury. *J Biomech*. 2017 Apr 11;55:11-17.
58. Thibaut A, Carvalho S, **Morse LR**, Zafonte R, Fregni F. Delayed pain decrease following M1 tDCS in spinal cord injury: A randomized controlled clinical trial. *Neurosci Lett*. 2017 Aug 16;658:19-26.
59. Carvalho S, **Morse LR**, Zafonte R, Fregni F. Study adherence in a tDCS longitudinal clinical trial with people with spinal cord injury. *Spinal Cord*. 2017 Dec 13.
60. Thibaut A, Zafonte R, **Morse LR** and Fregni F (2017) Understanding Negative Results in tDCS Research: The Importance of Neural Targeting and Cortical Engagement. *Front. Neurosci*. 11:707.
61. Carvalho S, Leite J, Bonin C, **Morse LR**, Zafonte R, Fregni F. Feasibility of remotely-supervised tDCS in a person with neuropathic pain due to Spinal Cord Injury. *J Spinal Cord Med*. 2018 Mar 28:1-2.
62. Associations between lean mass and leptin in men with chronic spinal cord injury: results from the FRASCI-muscle study. Park AJ, Battaglino RA, Nguyen N, **Morse LR**. *PLoS One*. 2018 Jun 27;13(6):e0198969.
63. Statins and Bone Health: A Mini Review. **Morse LR**, Coker J, Battaglino RA. *Actual. Osteol* 2018; 14(1): 31-35.
64. Keeney T, Slavin M, Kisala P, Ni P, Heinemann A, Charlifue S, Fyffe D, Marino R, **Morse LR**, Worobey L, Tate D, Rosenblum D, Zafonte R, Tulsy D, Jette AM. Sensitivity of the SCI-FI/AT in Individuals with Traumatic Spinal Cord Injury. *Arch Phys Med Rehabil*. 2018 Sep;99(9):1783-1788.
65. **Morse LR**, Troy K, Nguyen N, Battaglino R, Goldstein R, Gupta R, Taylor JA. Combination Therapy with Zoledronic Acid and FES-row Training Mitigates Bone Loss in the Paralyzed Legs: Results of a Randomized Comparative Clinical Trial. Under Revision, *JBMR Plus*.
66. Battaglino R, Nguyen N, **Morse LR**. Bisphosphonate use is associated with lower levels of the bone-derived hormone osteocalcin in men with spinal cord injury. Under Review, *Osteoporosis International*.
67. Monden, K.R., Philippus, A., **Morse, LR.**, Ketchum, J., Boals, A., Trost, Z. Unique predictors of perceived injustice and depression after spinal cord injury – evidence for distinct psychological constructs. Under Review, *Spinal Cord*.
68. Battaglino RA, Jha P, Weimin L, **Morse LR**. FKBP12: a partner of Snx10 required for vesicular trafficking in osteoclasts. Under Revision, *Journal of Cellular Biochemistry*.
69. Battaglino RA, Nguyen N, **Morse LR**. BAFF is Associated with Testosterone and Smoking Status in Non-ambulatory Men with Chronic Spinal Cord Injury. Under Review, *J Neurotrauma*.

Professional Educational Materials or Reports, in print or other media

1. Vranceanu AM, Zhao M, **Morse L**, Ring D. A multidisciplinary approach to arm illness. *Orthopedics Journal of Harvard Medical School*. Volume 10, 2008.

Book Chapters

1. **Morse LR**, Battaglino RA, Widrick JJ. Menopauses and the Musculoskeletal System, in *Pain in Women, A Clinical Guide*, A Bailey and C Bernstein ed.,; Springer Publishing, Allison Bailey, 255-275, 2013.
2. Hogaboom NS, Morse LR, Boninger ML. Overuse Injuries and Fractures in Spinal Cord Injury. *Spinal Cord Medicine*, Third Edition, Steven Kirshblum and Vernon Lin, Springer Publishing.