

CURRICULUM VITAE

Sheri P. Silfies, PT, PhD

109 Sumter Drive, Mooresville, NC 28117
C (267) 251-2423
e-mail: silfies@mailbox.sc.edu

EDUCATION:

BS	University of Scranton, Scranton, PA Major: Physical Therapy	1987
MS	Indiana University of Pennsylvania, Indiana, PA Major: Exercise Physiology/ Education Thesis: Applied Physiology in Postbaccalaureate, Entry-level Physical Therapy Curricula Advisor: Gary Dean, PhD	1994
PhD	MCP Hahnemann University, Philadelphia, PA Major: Rehabilitation Sciences Dissertation: Trunk Muscle and Motor Control Impairments in Patients with Lumbar Instability Advisor: Andrew Karduna, PhD	2002

ACADEMIC EMPLOYMENT:

University of South Carolina, Arnold School of Public Health, Department of Exercise Science Doctoral Program in Physical Therapy Associate Professor (Tenure-track)	Aug 2018-
Drexel University, Department of Physical Therapy & Rehabilitation Sciences, Philadelphia, PA Adjunct Associate Professor Tenured Associate Professor Graduate Faculty Research Appointment, College of Nursing and Health Professions Assistant Professor (tenure-track appointment) Assistant Professor (non-tenure-track)	Aug 2018- 2009-2018 April 2005- 2003-2009 2002-2003
MCP Hahnemann University, Programs in Physical Therapy, Philadelphia, PA Assistant Professor (non-tenure-track) Instructor (non-tenure-track)	2000-2002 1999-2000
College Misericordia (now Misericordia University), Physical Therapy Department, Dallas, PA Assistant Professor (non-tenure-track) Instructor and Academic Coordinator of Clinical Education (non-tenure-track)	1994-1999 1992-1994

RESEARCH APPOINTMENTS:

University of South Carolina, Arnold School of Public Health, Columbia, SC Mentor- Behavioral- Biomedical Interface Program Adjunct Associate Professor, Department of Exercise Science Visiting Professor, Department of Physical Therapy	June 2019- 2016-2018 2014-2015 AY
University of Denver, Denver, CO Visiting Professor, Department of Mechanical Engineering	2014-2015 AY
Yale University School of Medicine, New Haven, CT Postdoctoral Fellowship /Research Associate, Department of Orthopedics and Rehabilitation Mentor/ Supervisor: Jacek Cholewicki, PhD	2002 – 2004

CLINICAL EMPLOYMENT:

Drexel University Physical Therapy Practice (consultant and treating therapist)	2007- 2018
Per Diem Staff Physical Therapist, Allied Services Rehabilitation, 1992 -1994, Consultant	1994- 1999
Allegheny & Chesapeake Physical Therapist, Inc., Johnstown, PA Clinical Director/ Director of Craniomandibular Dysfunction Program Center Coordinator of Clinical Education and Education Director	1988- 1992 1990 -1992
East Hills Rehabilitation and Fitness Institute, Johnstown, PA Staff Physical Therapist	1987-1988

PROFESSIONAL LICENSURE/REGISTRATION:

Pennsylvania: Physical Therapist -PT 006279-L (by examination, 1987)
South Carolina: Physical Therapy PT 9093 PT (by transfer, 2018)
APTA: Board Certified Clinical Specialist in Orthopedic Physical Therapy (1995 - 2005)

HONORS AND AWARDS:

APTA, Section on Research, Traveling Fellowship Award	2014- 2015
Alpha Eta National Honor Society, Faculty Inductee	May 2008
ISSLS Prize Low Back Pain Research, International Society for the Study of the Lumbar Spine	2005
Foundation for Physical Therapy Research Doctoral Scholarship	1997 - 1998

TEACHING:

University of South Carolina

PHYT 701 Human Musculoskeletal and Gross Anatomy	(DPT)	Fall Course
EXSC 755 Applied Human Biomechanics	(MS, PhD)	Spring Course
PHYT 888 Research Project in Physical Therapy	(DPT)	
EXSC 499 Independent Research Study	(UG)	
BIOL 399 Independent Research Study	(UG)	
EXSC 798 Project in Exercise Science	(MS)	

Drexel University

Entry-Level Doctor of Physical Therapy Program

Evidence-based Practice (director/instructor)
Kinesiology (director/ instructor)
Orthopedic Spine (director/ instructor)
Musculoskeletal Tissue Pathology (course director/ instructor)
Biomechanics (director /instructor)
Clinical Topics in Spinal Rehabilitation (course director/ instructor)
Applied Biomechanics (course director/ instructor)
Human Gross Anatomy (instructor)
Research Practicum (mentor)
Final Project (mentor)

Post-Professional Doctor of Physical Therapy

Applied Tissue Biomechanics (director/ instructor)
Clinical Topics in Spinal Rehabilitation (director/ instructor)
Evidence-based Rehabilitation (director/instructor)

DHSc in Rehabilitation Sciences

Application of Evidence to Practice (director/instructor)
Spinal Rehabilitation (instructor)
Research Practicum (mentor)
Clinical Question Development (mentor)
Scholarship I, II, III (mentor)

PhD in Rehabilitation Sciences

Biomechanics I (director / instructor)
Foundations of Rehabilitation Research (director/ instructor)
Independent Study (mentor)
Research Practicum (mentor)
Teaching Practicum (mentor)
Dissertation Research (mentor)

Drexel School of Medicine

PhD Neuroscience/ Neuroengineering

Motor Systems (lecturer)

Misericordia University

Human Gross Anatomy (director/ instructor)
Analysis of Human Movement/ Movement Science (director/ instructor)
Clinical Science I (Musculoskeletal- extremity and spine) (series director/ instructor)
Clinical Decision Making (director/ instructor)
Special Topics (course director/ instructor)
Advanced Joint Anatomy and Biomechanics (cadaver course)

RESEARCH SUPERVISION:

University of South Carolina

Postdoctoral Fellowship

Current

Courtney Butowicz, PhD, CSCS 2018-
K99/R00 Impact Score 38 6/2019
Linking Cortical Sensorimotor Changes to Impaired Movement Control in Lower Limb Amputees

Doctoral Degree

PhD

Dissertation Chair

Current

Committee Member

Current

Charles Smith, MS, CSCS 1/2020-
Candidacy Status
Proposal Defense

Graduated

Max Jordon, PT, DPT (University of South Carolina) 2014-2019
Candidacy Status 3/2016
Proposal Defense 5/2017
University of South Carolina
Mentor: Paul Beattie, PT, PhD
Title: Effects of Spinal Manipulation on Somatotopic Organization in Individuals
With Low Back Pain

Silfies, Sheri

Grants: 1 submitted, 1 funded -Orthopaedic Section APTA

Faculty: University of Tennessee

Doctor of Physical Therapy

Current

Committee Chair

J. Kutcha, C. Powell, and O. Williams

2018-

Project: Association between Extensor Muscle Force Control and Temporary Low Back Pain Development during the Prolong Standing Test in Healthy Adults

Committee Member

Jordan Bartholf, John Snyder, Elyse Douglas

2019-

Project: The Association Between Previous Injury, Lower Extremity Motor Competency, Mental Health and Injury Prediction in Reserve Officers' Training Corps Cadets

Co-mentor with Dr. Arnot

W. Austin, D. Wiles, and T. DeHaven

2018-

Project: Predicting Lower Extremity Injury in U of SC ROTC: A Preliminary Study

Co-mentor with Dr. Arnot

Graduated

Keira Everatt and Allison Goodwin

2017

Project: The Effect Of Abnormal Morphology Of Trunk Muscles On Low Back Pain:

A Systematic Review

Committee Member

Masters Research Projects

Jacob Moore

12/2019-

Project: Measurement Properties of Strength Testing Methods and Devices for Lower Limb Muscles

Andrew Jacobs

1/2020-

Project: Development and Reliability of a Force Matching Protocol for Trunk Extensor Muscles

Undergraduate Research Supervision

Kerrigan Sunday (Biomed Eng)

1/2019 –

Honors College Surf Grant (10/19/19-6/30/20)

Stephanie Hals (Biology)

8/2019 -

Alexa Bellias (Biology)

8/2019 -

Holly Bennett (Exer Sci)

9/2019-

Lauren Palmariello (Biology/Sports Management)

10/2019 -

Drexel University

Doctoral Degree (PhD/DHSc) in Rehabilitation Sciences

Dissertation Chair

Current

Travis Pollen, MS

2016-

Candidacy Status

04/ 2018

Proposal Defense

02/ 2019

Title- A Multifactorial Model of Risk Factors for Non-Contact Musculoskeletal Injury in Collegiate Swimmers: A Prospective Study

Manuscripts: 2 published, 2 in progress

Abstract: 5 National Conferences

<i>Graduate College Doctoral Fellowship (Gold)</i>	2016-18
"The Science of Core Training and Injury Prevention," Fitness and Fishnets Podcast	2019
Eric Folkins, PT, DPT, OCS, CSCS	2016 -
Candidacy Status	07/ 2018
Proposal Defense	09/ 2019
Title- Clinical Tests Predictive of Temporary Low Back Pain Development During Prolonged Standing In Healthcare Students	
<i>Abstract: 5 National Conferences</i>	
<i>Academy of Physical Therapist Education- 2020 Adopt-a-Doc grant winner</i>	12/2019
Graduates	
Scott Biely, DPT, PhD, OCS, MTC	2004 - 2012
Graduation	05/ 2012
Candidacy Status	05/ 2008
Title: <i>Identifying the Subgroup of Patients with Mechanical Low Back Pain that have Clinical Lumbar Instability</i>	
<i>Manuscripts: 3 published</i>	
<i>Abstracts: 7 National Conferences; 1 International Conference; 1 Invited Presentation</i>	
<i>Grants: 2 submitted; 1 funded</i>	
Faculty: Neumann University	
Rupal Mehta, PT, PhD	2005 -2012
Graduation	10/ 2012
Candidacy Status	09/ 2009
Title: <i>Effects of Lumbar Stabilization Exercises on Trunk Postural Control, Strength and Endurance in a Subgroup of Patients with Nonspecific Low Back Pain Attributed to Motor Control Impairment</i>	
<i>Manuscripts: 3 published</i>	
<i>Abstracts: 4 National Conferences; 1 International Conference</i>	
<i>Grants: 1 submitted, not funded</i>	
Clinical Researcher: Baida Home Health, Delaware	
Peemongkon Wattananon, PT, PhD	2008 - 2014
Graduation	04/ 2014
Candidacy Status	09/ 2011
Proposal Defense	05/ 2013
Title: <i>Movement Coordination Impairment in Non-Specific Low Back Pain: Understanding Aberrant Kinematic Patterns and Our Ability to Change Them</i>	
<i>Manuscripts: 5 published</i>	
<i>Abstract: 4 National Conferences, 2 International Conferences</i>	
<i>Grants: 2 submitted, not funded</i>	
Faculty: Mahidol University, Thailand	
Bryan Spinelli, PT, PhD, OCS, CLT#	2007- 2016
Graduation	06/ 2016
Candidacy Status	06/ 2009
Proposal Defense	11/ 2012
Title: <i>Shoulder Girdle Impairments Associated with Breast Cancer Survivors</i>	
Manuscript: 4 published	
<i>Abstracts: 5 National Conferences</i>	
<i>Grants: 3 submitted, 2 funded</i>	
Awards: Drexel University Outstanding Promise Award	
Faculty: Thomas Jefferson University, Philadelphia, PA	
Won Sung, DPT, PhD	2010 - 2016
Graduation	06/ 2016

Candidacy Status 01/ 2012
 Proposal Defense 04/ 2015
 Title: *Validation of Clinical Tests Used to Identify Patients Who Would Benefit From Trunk Stabilization Exercises: Preliminary Steps to Refine Test Interpretation and Improve Intervention Prescription*
 Manuscripts: 2 published
 Abstract: 11 National Conferences
 Grants: 1 submitted, not funded
 Clinical Researcher: University of Pennsylvania, Good Shepherd Penn Partners
 Adjunct Faculty: Arcadia University & Drexel University

Courtney Butowicz, PhD, CSCS 2012- 2016
 Office of Graduate Student Fellowship 2012-13
 Graduation 06/ 2016
 Candidacy Status 01/ 2014
 Proposal Defense 09/ 2015
 Working title- *Comprehensive Performance Based Movement Screening Tool for Athletes*
 Manuscripts: 12 published
 Abstracts: 5 National, 1 International Conference
 Awards: Drexel University Research Excellence Award
 Postdoctoral Fellow: Walter Reed Medical Center, Washington, DC
 Postdoctoral Fellow: University of South Carolina, SC

Marisa Pontillo, DPT, PhD, SCS# 2009- 2016
 Graduation 06/ 2016
 Candidacy Status 08/ 2012
 Proposal Defense 12/ 2013
 Title- *The Relationship between Core Stability and Shoulder Injuries in Athletes*
 Manuscripts: 5 published
 Abstract: 4 National Conferences
 Grants: 1 submitted; 1 funded
 Clinical Researcher: University of Pennsylvania, Good Shepherd Penn Partners

Dissertation Committee Member

Current

Mary Whitten, PT, DPT, CHT 2014 –
 Candidacy Status 12/2017
 Proposal Defense 02/ 2019
 Title- *A Delphi Study Establishing Consensus In The Therapeutic Management Of Post-traumatic Elbow Stiffness*

Graduates

Anne Galgon, PT, PhD, NCS 2002 - 2009
 Title: *Postural Learning during Practice of a Sequential Reaching Task*
 Drexel University PhD 06/ 2009
 Faculty: University of the Sciences, Philadelphia

Elizabeth Wang-Hsu, PT, PhD 2006- 2015
 Title: *Effectiveness of Impairment-Specific Exercise Intervention in Reducing Fall Risk for Older Adults*
 Drexel University PhD 6/ 2015
 Manuscripts: 2 in progress
 Abstract: 2 National Conferences
 Grants: 3 submitted; 1 funded
 Research Clinician: University of Pennsylvania, Good Shepherd Penn Partners

Dwight Higgins, PhD 2009-2015

Drexel University, College of Medicine
 Neurobiology and Anatomy Department, PhD
 Mentor: Michele Lemay, PhD
 Title: *Locomotor Recovery Adaptations to Walking on Graded Surfaces in the Spinal Cat*
 Faculty: Wilmington University

Han Chen, MD, MPH, PhD 2011-2017
 Drexel University PhD 6/ 2017
 Title: *Performance-Based Assessment Framework for Community-Dwelling Older Adults*
 Mentor: Susan Smith, PT, PhD
 Abstract: 3 International and National Conferences
 Manuscripts: 1 published, 1 in review
 MD Researcher: Department of Rehabilitation Medicine, Southwest Hospital –
 Army Medical University

Nathaniel Bridges, PhD 2013-2017
 Biomedical Engineering, Science and Health Systems
 Mentor: Karen Moxon, PhD; Drexel Neurorobotics Lab
 Title: *Developments Towards Postural-centric Brain Machine Interfaces*
 Postdoctoral Fellow: Center for the Intrepid

Jonathan Garcia 2014-2017
 Candidacy Status 8/ 2015
 Proposal Defense 9/ 2016
 Biomedical Engineering, Science and Health Systems
 Mentor: Karen Moxon, PhD; Drexel Neurorobotics Lab
 Grants: DOE GAANN grant – Drexel iCare for Healthcare GAANN Fellow (secondary mentor)
 Status: *Transferred to another Drexel degree program*

Doctor of Physical Therapy- Graduate Research Projects Advised

Graduated

Cunningham, Dougherty, Kaka DPT Project: Item Inter-rater reliability on Drexel Dancer Performance Screening Tool (Ebaugh, Butowicz, Silfies mentors)	2016
Caffaro, Paster, Wylie DPT Project: Development and Training of the Movement Assessment Screening Tool (Ebaugh, Butowicz, Tomaszewski, Silfies mentors)	2016
Chisch, Pecoraro DPT Project: Pilot research on novel strength testing device. (Goodstadt, Silfies mentors)	2016
Josh Lamb, DPT Project: Use of lumbar stabilization and leg strengthening to treat low back pain in a male construction worker	2014
Michael Roberto, DPT Project: Use of NMES alone to lumbar paraspinals decreases pain while improving function and performance: a case study	2013
Magda Southard, SPT, and Julie Wagner, SPT Project: Lumbar Stabilization Exercises: Home Exercise Video	2009- 2011
Michael Alex Haddad, DPT	2008 - 2010

Silfies, Sheri

Project: Sagittal Plane Kinematics of the Thoracic Spine during Forward Bending:
A Pilot Study

Austin Ream, DPT 2007 - 2008
Project: Kinematic Patterns during Forward Bending Motion
Abstracts: 1 National conference

Janelle Mongan, DPT 2005 - 2006
Project: Clinical Utility of an Automatic Blood Pressure Cuff for Determining
Ankle-Brachial Index: A Case Series

Andrew Seo, DPT 2004 - 2005
Project: Trunk Extensor Muscle Imbalances in Chronic Low Back Pain Patients
with Degenerative Disc Disease
Abstracts: 1 National Conference

Becky Austerer, DPT 2004 - 2005
Project: Clinical and Biomechanical Changes of Neuromuscular Impairments in a
Patient with Clinical Lumbar Instability: A Case Report
Abstracts: 1 National Conference

Shawn Maloney, DPT 2003 - 2004
Project: Dynamic Lumbar Stabilization Using a Motor Learning Paradigm
for the Treatment of a Patient with Clinical Spinal Instability: A Case Report

Physical Therapy Orthopaedic Residency Research Projects Advised (Resident)

Piggott A, Goodstadt N, Ramakrishnan A, Balasubramanion S, Silfies SP. (2018) Test-retest reliability and concurrent validity of a novel portable adaptable strength testing device. *J Ortho Sports Phys Ther*, 48(1):A165-66

Green, R, Sullivan, C, Butowicz, C*, Silfies, SP (2017) Normative Data for Clinical Tests of Core Stability. *J Ortho Sports Phys Ther*, 47(1)A182

Hagan, J, Maschi, R, Goodstadt, N, Silfies, SP. (2015) Neuromuscular Electrical Stimulation To The Lumbar Multifidus In Combination With a Novel Function-Specific Core Stabilization and Trunk Strengthening Program: A Case Report. *J Ortho Sports Phys Ther*, 45(1)A114

Roberto, M, Goodstadt, N, Silfies, SP. (2015) NMES to the lumbar multifidus in conjunction with trunk stabilization exercises returns patient to a high level of competition following an L4-L5 microdiscectomy. *J Ortho Sports Phys Ther*, 45(1)A21

Masters Degree in Rehabilitation Sciences

Committee Chair

Graduates

Heather Smith, PT, MHS, OCS 1999 - 2002
Title: The Use of Dynamic Lumbar Stabilization Exercise in Acute Low Back Pain:
A Case Study

Department of Physical Therapy & Rehabilitation Sciences
MCP Hahnemann University 12/ 2002
Abstracts: 1 State Conference

Anthony Damiano, PT, MHS, OCS 1998 - 2003
Title: The McKenzie Approach to Physical Therapy Diagnosis of Functional Lumbar
Instability in a 14-Year-Old Male Gymnast: A Case Report
Department of Physical Therapy & Rehabilitation Sciences

Drexel University	05/ 2003
Anand Bhattacharya, PT, MHS Title: Trunk Control during Standing Reach: Is Control Strategy Altered by Mechanical Low Back Pain? Department of Physical Therapy & Rehabilitation Sciences Drexel University	2005 - 2007
<i>Abstracts: 1 National Conference; 1 International Conference</i> <i>Manuscript: 1 published</i>	09/ 2007
Evan Ross, MS Biomedical Engineering	2006 - 2007 06/ 2007

Undergraduate Research

Graduates

Michael Barkofski, Robert McCollum, Alex Santangelo, Amanda Storm School of Biomechanical Engineering & Sciences Senior Design Project Project: <i>Sensor for Measuring Maximum Isometric Force in Physical Therapy Exercise Equipment</i> Co-mentors: Sri Balasubramanion, Noel Goodstadt	2014
Omkar Baxi, Cong Bai Li, Ian McDonald, Silpa Reedy School of Biomechanical Engineering & Sciences Senior Design Project Project: <i>Designing a control-moment gyroscope to introduce perturbations to an existing trunk control testing apparatus</i> Co-mentor: Dr. Marco Cannella <i>Honorable Mention Award at Graduation</i>	2010
Rohini Ghatge Health Sciences BS/DPT Program Pennoni Honors College STAR Scholars Program Project: <i>Reliability of Electromyographic Measures of Trunk Neuromuscular Control</i>	2008

RESEARCH AND SCHOLARSHIP:

ONGOING GRANT FUNDING (* PhD Student; \$ amounts represent total costs)

1. National Institutes of Health/ NICHD

R01 HD095959 Silfies(Co-PI) \$1,572,794 9/2018-5/2022

Linking Altered Cortical Sensorimotor Integration with Movement Impairments in Back Pain

Aim 1: Determine the differences in brain activation during sensory stimulation and performance of spinal movement tasks between individuals who have cLBP compared to those in an asymptomatic control group. **Aim 2:** Evaluate the impact of reductions in cortical integration on trunk movement and postural control. **Aim 3:** Explore the association between pain-related cognitive-behavioral measures (e.g., fear of movement, anxiety, depression) and reductions in cortical integration in individuals with cLBP. **Impact:** Establishing the presence of sensorimotor brain changes, verifying their impact on movement and exploring the moderating effects of pain-related cognitive-behavioral will provide a pathway forward based on important underlying mechanisms of cLBP. **Role:** Co-PI with Jennifer Vendemia, Department of Psychology, University of South Carolina

Beattie and Stewart are co-investigators with salary support
Current Year 2 = \$402.929

2. Dean's Grant (Drexel University)

College of Nursing & Health Professions (Wenger PI) \$10,000 11/2019-12/2020

Interprofessional Chronic Pain Care: A Train the Trainer Program (3T)

Objective: To create a pilot technology platform that will enable high quality beta and feasibility feedback about train the trainer concept and design for interprofessional chronic pain care.

Role: Co-I

Current Year =\$10,000 (no salary support)

COMPLETED SUPPORT

1. American Physical Therapy Association

Clinical Research Grant Program Jordon* (PI) \$23,000 6/2017-8/2019
Orthopaedic Section, American Physical Therapy Association

Effects Of Spinal Manipulation On Somatotropic Organization In Individuals With Low Back Pain

Role: Co –I Beattie, Silfies, Vendemia

2. Wallace H. Coulter Foundation

Translation Research Biomedical Engineering Silfies (Co-PI) \$100,000 7/2016- 9/2018

Portable Adaptable Strength Testing Device

The aims of this study are to 1) complete development, 2) determine instrument safety and reliability, 3) determine clinical reliability and validity, and 4) complete software application development.

Role: Co –PIs- Goodstadt, Ramakrishnan, Balasubramanian

3. ASPIRE Grant

Campbell- Stewart (PI) \$15,000 5/2015-8/2017

University of South Carolina

Deficits in Planning Reach Distance after Stroke: Motor Capacity or Learned Non-Use

Role: Consultant

4. ExCITE Center Grant

Silfies (Co-PI) \$5,000 9/2015-8/2016

Drexel University

Research and development of the next prototype for a novel, portable and adaptable clinical force measurement system that changes any weight machine into a strength-testing device.

Role: Co-PIs- Goodstadt, Balasubramanian, Ramakrishnan

5. Visiting Professor Grant

Fritz, Beattie (Co-PI) \$14,815 1/2015-6/2015

University of South Carolina grant funding teaching and research collaboration.

Research collaboration (fMRI) somatosensory and motor cortex changes associated with chronic low back pain.

Role: Consultant

6. American Physical Therapy Association

Sports Legacy Fund Pontillo* (Co-PI) \$5,000 3/2013-6/2016

Relationship between Core Stability and Shoulder Injuries in Athletes

The specific aims of this study are to 1) determine the strength of the association between clinical and lab-based measures of core stability in the athletic population and 2) identify the clinical and lab-based measures of core stability that are significant predictors of shoulder injuries in athletes.

Role: Co-PI

7. American Physical Therapy Association

Orthopaedic Section Research Grant Ebaugh (PI) \$10,000 6/2011-8/2014

Validity of Clinical Assessments of Resting Scapular Alignment and Scapulohumeral Movement Patterns

The goals of this research project are to: 1) determine the ability of clinical assessments of resting scapular alignment and scapulohumeral movement patterns to identify individuals with shoulder pain, 2) establish the relationship between clinical assessments of resting scapular alignment and scapulohumeral movement patterns, and 3) use instrumented scapulohumeral kinematic data to expand the current understanding of the coordination and control of scapulohumeral movement.

Role: Co-Investigator

8. National Institutes of Health/NICHD

K01 HD053632 Silfies (PI) \$427,000 6/2007-5/2012

Recurrent Low Back Pain: Linking Mechanism to Outcomes

The goal of this project was to develop reliable and responsive methods of measuring trunk neuromuscular control and assessing the efficacy of core stabilization exercises in patients with mechanical low back pain attributed to functional lumbar instability.

Role: PI

Mentor: Simon Giszter, PhD, Neurobiology and Anatomy, Drexel College of Medicine

9. American Physical Therapy Association

Orthopaedic Section Research Grant Silfies (Co-PI) \$24,375 4/2008-8/2010

Validation of Clinical Observation of Aberrant Movement Patterns in Patients with Mechanical LBP

The goal of this project was to determine the clinical utility of the observation of aberrant movement patterns in patients with mechanical low back pain, by assessing inter-rater reliability and predictive validity of physical therapist observation and trunk kinematics during clinical examination.

Role: Co-PI with Scott Biely*, Susan Smith

10. Planning Grant (Drexel) Silfies (Co-PI) \$5,000 1/2005-1/2006

Drexel University, College of Nursing and Health Professions

Role of Unresolved Musculoskeletal Impairments in the Development of Recurrent and Chronic LBP

Role: Co-PI with Susan Smith

11. Pilot Grant (Drexel) Silfies (PI) \$14,000 5/2005-5/2006

Drexel University, College of Nursing and Health Professions

Stability and Responsiveness of Seated Postural Control Variables in Patients with Acute Musculoskeletal LBP

Role: PI

12. National Institute of Disability and Rehabilitation Research

H133F030024 Silfies (PI) \$45,000 9/2003-8/2004

Switzer Research Fellowship Program

Is Passive Spine Instability a Determinant of Trunk Motor Control Differences between Asymptomatic Individuals and Patients with Chronic Low Back Pain?

The primary aims of this research project were to determine the differences in trunk motor control strategies between asymptomatic individuals and patients with chronic low back pain during a standardized functional task and establish whether passive spine instability is the determinant of these motor control differences.

Role: PI

13. American Physical Therapy Association

Orthopaedic Section Research Grant Silfies (PI) \$5,000 9/1999-8/2000

Classification of Low Back Pain Patients based upon Trunk Electromyographic and Kinematic Patterns

The goals of this project were to identify differences among LBP subjects with lumbar instability, LBP subjects without lumbar instability, and healthy subjects' muscle and movement patterns during a functional reaching task.

Role: PI

OTHER RESEARCH EXPERIENCE:

Lab Director	Applied Neuromechanics Laboratory at University of South Carolina	2018-
Lab Director	Rehabilitation Sciences Research Laboratories at Drexel University	2005- 2018

PUBLICATIONS:

Peer-Reviewed

* PhD Student; ** Masters Student or Resident; *** DPT student, # undergraduate student
JIF-Web of Science; SJR-SCImago; RGIF-Research Gate

1. Pontillo M*, Butowicz C*, Thigpen CA, Sennett B, Ebaugh DD, **Silfies, SP.** (2019) Comparison of Core Neuromuscular Control and Lower Extremity Postural Stability in Athletes with and without Shoulder Injuries, *Clin*

Biomec 2019 Nov 18;71:196-200. doi: 10.1016/j.clinbiomech.2019.11.008. (JIF:1.863; Journal Ranking: 38 out of 77 in Orthopedics)

2. Butowicz, C*, Pontillo, M*, Ebaugh, **Silfies, SP** (2019) Comprehensive movement system screen (MSST) for athletes: Development and measurement properties *Brazil J of Phys Ther* 1 Nov 2019 [Epub ahead of print] (JIF:1.699; Journal Ranking: 35 out of 65 in Rehabilitation)
3. Butowicz, C, **Silfies SP**, Vendemia J, Farrokhi S, Hendershot B. (2019) Characterizing the low back pain experience in persons with unilateral lower limb loss, *Pain Med* 2019 Nov 9. pii: pnz293. doi: 10.1093/pm/pnz293. [Epub ahead of print] (JIF: 2.820; Journal Ranking: 32 out of 155 in Medicine, General & Internal)
4. Sung W*, Ebaugh DD, Hicks G, Stackhouse S, Smith SS, Wattananon P, **Silfies SP**. (2019) Individuals With and Without Low Back Pain use Different Motor Control Strategies to Achieve Spinal Stiffness During the Prone Instability Test, *Journal Ortho Sport Phys Ther*, 49(12):899-907 (JIF: 3.090; Journal Ranking: 9 out of 65 in Rehabilitation; Official Journal of the Academy of Orthopaedic Physical Therapy) Citation 1
5. Butowicz, C, Acasio JC, **Silfies SP**, Nussbaum M, Hendershot B, (2019) Trunk postural control differences among persons with lower limb loss: Influences of chronic low back pain, *Gait & Posture* 74: 236-241. (JIF: 2.273; Journal Ranking: 31 out of 81 in Orthopedics)
6. Wattananon, P, **Silfies, SP**, Tretriluxana J, Jalayondeja W (2019): Lumbar multifidus and erector spinae muscle activation pattern changes in patients with non-specific low back pain during prone hip extension, *PM&R*, 2019; 11 (7): 694-702. (JIF: 1.850; Journal Ranking: 25 out of 65 in Rehabilitation) Citations 1
7. Pontillo M*, **Silfies SP**, Butowicz C*, Thigpen CA, Sennett B, Ebaugh DD (2018) Comparison of core stability and balance in athletes with and without shoulder injuries. *Int J Sports Phys Ther*. 2018 Dec; 13(6): 1015–1023. PMID: [30534467](https://pubmed.ncbi.nlm.nih.gov/30534467/) (RGIF: 1.68; Official Journal of the American Academy of Sports Physical Therapy) Citations 1
8. Mitchell KD, Chen H*, **Silfies SP**. (2018) Test-retest Reliability, Validity and Minimal Detectable Change of the Balance Evaluation Systems Test to Assess Balance in Persons with Multiple Sclerosis, *Int Journal of MS Care* 20(5); pp 231-237. <https://doi.org/10.7224/1537-2073.2016-118> (SJR: 0.65; Official Journal of the International Organization of Multiple Sclerosis Rehabilitation Therapists) Citations 1
9. Sung W*, Wong A**, Pourshogi A, Pourrezaei K, **Silfies SP** (2018) Near infrared spectroscopy confirms recruitment of specific lumbar extensors through neuromuscular electrical stimulation, *Physiotherapy Theory and Practice*, 2018, June 28:1-8.DOI: [10.1080/09593985.2018.1488908](https://doi.org/10.1080/09593985.2018.1488908) (JIF:1.998; Journal Ranking: 48 out of 65 in Rehabilitation)
10. Wattananon, P*, Ebaugh, D, Biely, S, Smith, S, Hicks G, **Silfies, SP**. (2017) Kinematic characterization of clinically observed aberrant movement patterns in patients with non-specific low back pain: A cross-sectional study, *BMC Musculo* 2017 Nov 15;18(1):455. doi: 10.1186/s12891-017-1820-x. (JIF:1.998; Journal Ranking: 34 out of 77 in Orthopedics) Citations 5
11. Wattananon, P, Intawachirarat N, Canella M, Sung W, **Silfies, SP** (2017) Reduced instantaneous center of rotation movement in patients with low back pain, *Eur Spine J* 2018 Jan;27(1):154-162. DOI 10.1007/s00586-017-5054-2 (JIF:2.634; Journal Ranking: 20 out of 77 in Orthopedics) Citations 3
12. Spinelli B*, **Silfies SP**, Jacobs L, Brooks A, Ebaugh DD. (2016) Scapulothoracic and Glenohumeral Motion during Functional Reaching Tasks in Women with a History of Breast Cancer and Healthy Age-Matched Controls. *Rehab Oncology*, 2016; 34(4), 127-136 (SJR .20; Official Journal of the Oncology Section of the American Physical Therapy Association) Citations 3
13. Beattie P, **Silfies SP**, Jordon M* (2016) The Evolving Role of Physical Therapists in the Long-Term Management of Chronic Low Back Pain: Longitudinal Care Using Assisted Self-Management Strategies *Brazilian J Phys Ther* 2016, Nov-Dec; 20(6):580-591; <http://dx.doi.org/10.1590/bjpt-rbf.2014.0180> (JIF:1.699; Journal Ranking: 35 out of 65 in Rehabilitation) Citations 34

14. Butowicz, C*, Ebaugh, DD, Noehren, B, **Silfies, SP**. (2016) Validation of Two Clinical Measures of Core Stability. *Int J Sports Phys Ther*, 2016; 11(1), 15-23. (RGIF: 1.68; Official Journal of the American Academy of Sports Physical Therapy) Citations 34
15. Mehta, R*, Cannella, M, Henry, S, Smith, S, Giszter, S, **Silfies, SP**. (2015-online) Trunk Postural Muscle Timing Is Not Compromised In Low Back Pain Patients Clinically Diagnosed with Movement Coordination Impairments, *Motor Control* 2017 Apr; 21(2): 133-157.; <http://dx.doi.org/10.1123/mc.2015-0049> (JIF:1.037; Journal Ranking: 230 out of 256 in Neuroscience) Citations 11
16. **Silfies, SP**, Ebaugh, DD, Pontillo, M*, Butowicz, CM*. (2015) Critical Review of the Impact of "Core Stability" on Upper Extremity Athletic Injury and Performance, *Brazilian J Phys Ther*, 2015;19(5):360-368 <http://dx.doi.org/10.1590/bjpt-rbf.2014.0108> (JIF:1.699; Journal Ranking: 35 out of 65 Rehabilitation) Citations 62
17. Sung W*, Abraham M, Plastaras, C, **Silfies SP**. (2015) Trunk Motor Control Deficits in Acute and Subacute Low Back Pain are Not Associated with Pain or Fear of Movement, *Spine J*, 2015; 15(8):1772-1782. PMID:25862508 [PubMed - in process] DOI:10.1016/j.spinee.2015.04.010 (JIF:2.660; Journal Ranking: 11 out of 74 in Orthopedics) Citations 22
18. Spinelli B*, Wattananon P*, **Silfies, SP**, Ebaugh D, Talaty, M. (2014) Using Kinematics and a Dynamic Systems Approach to Enhance Understanding of Clinically Observed Movement Patterns, *Man Ther*, 20(1):221-226. NIHMSID # 616172; DOI: <http://dx.doi.org/10.1016/j.math.2014.07.012> (JIF:1.714; Journal Ranking: 22 out of 65 in Rehabilitation) Citations 23
19. Biely, SA*, **Silfies, SP**, Smith, S, Hicks, G. (2014) Clinical Observation of Standing Trunk Movements: What Do the Aberrant Movement Patterns Tell Us? *J Ortho Sports Phys Ther*. 2014; 44(4):263-273. PubMed PMID: 2445037 (JIF:3.011; Journal Ranking: 4 out of 64 in Rehabilitation; Official Journal of the Academy of Orthopaedic Physical Therapy) Citations 45
20. Mehta, R*, Cannella, M, Smith, S, **Silfies, SP** (2010) Altered Trunk Motor Planning in Patients with Non-Specific Low Back Pain, *J Motor Behavior*. 42(2):135-144. PubMed PMID:20207604 (JIF:1.650; Journal Ranking: 183 out of 239 in Neuroscience) Citations 48
21. Giszter, SF, Hart, C, **Silfies, SP** (2010) Spinal cord modularity, its evolution, development, and its possible relevance to low back pain in man: an exploration and speculation. *Exp Brain Res*, 200(3-4):283-306. PMCID: PMC2861904 (JIF:2.296; Journal Ranking: 151 out of 239 in Neuroscience) Citations 36
22. **Silfies, SP**, Mehta, R*, Smith, S, Karduna, A. (2009) Differences in Feedforward Trunk Muscle Activity in Subgroups of Patients with Mechanical Low Back Pain, *Arch Phys Med Rehabil*, 90:1159-69. (JIF:2.814; Journal Ranking: 6 out of 33 in Rehabilitation) Citations 152
23. **Silfies, SP**, Bhattacharya A**, Biely, S*, Smith, S, Giszter, S. (2009) Trunk Control during Standing Reach: A Dynamical System Analysis of Movement Strategies in Patients with Mechanical Low Back Pain. *Gait Posture*, 29:370-376. PMCID: PMC2671394 (JIF: 2.576; Journal Ranking: 9 out of 56 in Orthopedics) Citations 84
24. **Silfies, SP**, Cholewicki, J, Reeves, NP*, Green, H. (2007) Lumbar Position Sense and the Risk of Low Back Injuries in College Athletes: a Prospective Cohort Study. *BMC Musculoskelet Disord*, 8(129):129. doi:10.1186/1471-2474-8-129 <http://www.biomedcentral.com/1471-2474/8/129> (JIF: 1.323; Journal Ranking: 22 out of 48 in Orthopedics) Citations 61
25. Reeves, NP*, Cholewicki, J, **Silfies, SP**. (2006). Muscle Activation Imbalance and Low-Back Pain in Varsity Athletes. *Journal of Electromyogr Kinesiol*, 16(3): 264-272. (JIF:1.725; Journal Ranking: 9 out of 27 in Rehabilitation) Citations 60
26. Biely, SA*, Smith, SS, **Silfies, SP**. (2006) Clinical Update: Assessment and Treatment of Clinical Spinal Instability, *Orthopedic Practice*, 18(3):11-18. Citations 39

27. Cholewicki, J, **Silfies, SP**, Shah, RA, Greene, HS, Reeves, NP*, Alvi, K, Goldberg, B. (2005). ISSLS Prize 2005: Delayed Trunk Muscle Reflex Responses Increase the Risk of Low Back Injuries. *Spine*, 30(23): 2614-2620. (JIF: 2.817; Journal Ranking: 5 out of 41 in Orthopedics) Citations 387
28. **Silfies, SP**, Squillante, D, Maurer, P, Westcott, S, Karduna, A. (2005). Trunk Muscle Recruitment Patterns in Specific Chronic Low Back Populations. *Clin Biomech*, 20(5): 465-473. (JIF:1.505; Journal Ranking: 21 out of 56 in Orthopedics) Citations 205
29. **Silfies, SP**, Cholewicki, J, Radebold, A. (2003).The Effects of Visual Input on Postural Control of the Lumbar Spine in Unstable Sitting. *Hum Mov Sci*, 22 (3): 237-252. (JIF: .822; Journal Ranking: 139 out of 198 in Neuroscience) Citations 71
30. Cholewicki, J, Alvi, K, **Silfies, SP**, Bartolomei, J. (2003). Comparison of Motion Restriction and Trunk Stiffness Provided by Three Thoraco-Lumbo-Sacral Orthoses. *JSpinal Disord Tech*, (16)5: 461-8. (JIF: .742; Journal Ranking: 23 out of 42 in Orthopedics) Citations 30

Invited Commentary and Editorials

1. **Silfies SP**, Vendemia, J, Beattie P, Stewart JC, Jordon M* (2017) Changes in Brain Structure and Activation May Augment Abnormal Movement Patterns: An Emerging Challenge in Musculoskeletal Rehabilitation, *Pain Medicine* 2017, Nov; 18(11):2050-2054. doi.org/10.1093/pm/pnx190 (JIF: 2.820; Journal Ranking: 32 out of 155 in Medicine, General & Internal) Citations 1
2. Beattie, P and **Silfies, SP**. (2015) Improving Long-Term Outcomes for Chronic Low Back Pain: Time for a New Paradigm? *J Orthop Sports Phys Ther*, 2015; 45(5): 236-239. PMID:25827120 [PubMed - in process] doi: 10.2519/jospt.2015.0105. (JIF:2.551; Journal Ranking: 14 out of 74 in Orthopedics; Official Journal of the Academy of Orthopaedic Physical Therapy) Citations 18

Manuscripts in Review

1. **Silfies, SP**, Jordon M*, Beattie P, Vendemia J. Assessment of Motor Cortex Activation during Trunk Muscle Activation Tasks: Protocol Development (*J Neurophysiology-R2*) (JIF: 2.766; Journal Ranking: 14 out of 64 in Multidisciplinary Sciences)
2. **Pollen T***, **Roe C***, **Johnson D**, **Silfies SP**, **Noehren B**. Identifying Deficits in Trunk Neuromuscular Control in Patients Following Anterior Cruciate Ligament Reconstruction (*MMSE* in review)
3. Wattananon P, **Silfies SP**, Wang H. Patients with low back pain use stiffening strategy to compensate for movement control during active prone hip rotation: a cross-sectional study (*Musculoskeletal Sci & Practice* in review)

Manuscripts in Progress

1. Ramakrishnan, A, Giszter, S, **Silfies, SP**. Alterations in trunk muscle synergies in Individuals with low back pain. (target *J Neurophys*) (JIF: 2.502; Journal Ranking: 167 out of 261 in Neuroscience)
2. **Silfies SP**, Butowicz C, Camp A#, Hendershot B, Davidson B. Systems engineering combined with motor control approach to identify core control in individuals with and without LBP during a novel unstable sitting task (target *J Neurophys*) (JIF: 2.502; Journal Ranking: 167 out of 261 in Neuroscience)

Published Refereed Abstracts * PhD Student; ** DPT, Masters or Resident, # undergraduate student, Presenter

1. Jordon M*, Beattie P, **Silfies SP**, Bialosky JE, Steward JC. (2020) Individual with Chronic Low Back Pain Exhibit Alterations in Brain Activation during Lumbopelvic Motor Tasks. *J Ortho Sports Phys Ther*, 50(1):CSM129

2. Jordon M*, Beattie P, **Silfies SP**, Bialosky JE, Steward JC. (2020) Task-Based Functional Connectivity During Performance of Lumbopelvic Motor Tasks: An fMRI Study in Healthy Participants. *J Ortho Sports Phys Ther*, 50(1):CSM12
3. Smith C*, Hetherington A, **Silfies SP**, Stewart J. (2019) Joint Motion and Muscle Activation Scaling during 3-Dimensional Reach Actions, *J Sports & Exer Physio* (41) S49
4. Folkins E,* Tomlin W,** Wiley D,** Vourderis N,** Mark A**, Sebastian J,** Shen D,** Duong A,** Cavallaro M,** Pollen T,* **Silfies SP**. (2019) Test-retest reliability of the Movement System Screening Tool: A novel musculoskeletal screening tool. *J Ortho Sports Phys Ther*, 49(1):CSM16
5. Pollen T*, Folkins E*, Morhring J*, Noehren B, Ebaugh D, **Silfies SP**. (2018) Construct Validity of Three Tests of Core Neuromuscular Control. *Med Sci Sports Exerc* 50:572 DOI: 10.1249/01.mss.0000536973.96790.17
6. Jordon M*, **Silfies SP**, Beattie P, Vendemia J. (2018) Brain Activation During Lumbopelvic Exercises: An fMRI Study. *J Ortho Sports Phys Ther*, 48(1):A13-14
7. Piggott A*, Goodstadt N, Ramakrishnan A, Balasubramanian S, **Silfies SP**. (2018) Test-retest reliability and concurrent validity of a novel portable adaptable strength testing device. *J Ortho Sports Phys Ther*, 48(1):A165-66
8. Jordon M*, **Silfies SP**, Beattie P, Vendemia S, Vendemia J. (2017) Spinal Manipulation Increases Motor Cortex Activity in Healthy Adults: Preliminary Results from an fMRI Study. *J Ortho Sports Phys Ther*, 47(1):A105
9. Butowicz, C*, Pontillo, M*, Ebaugh, DD, Onato, J, Volpe, S., **Silfies, SP** (2017) Movement System Performance Differences in Athletes with and without a Non-traumatic Shoulder Injury. *J Ortho Sports Phys Ther*, 47(1):A34.
10. Green, R**, Sullivan, C**, Butowicz, C*, **Silfies, SP** (2017) Normative Data for Clinical Tests of Core Stability. *J Ortho Sports Phys Ther*, 47(1):A182.
11. Sung W*, Ebaugh DD, Hicks G, Stackhouse S, Smith S, Wattananon P, **Silfies SP**. (2017) Lumbar spine stiffness changes and muscle activation during the prone instability test. *J Ortho Sports Phys Ther*, 47(1):A151-2.
12. Butowicz, C.M*, Pontillo, M., Milner, C.E., Ebaugh, D., **Silfies, S.P.** (2016). Differences In Core Stability Between Collegiate Football Players With And Without Shoulder Pain. *Medicine & Science in Sports & Exercise* 48(5 Suppl 1):286. doi: 10.1249/01.mss.0000485860.64888.e0.
13. Sung, W*, **Silfies, SP** (2016) Trunk Muscle Activation and Synergy Patterns During the Multifidus Lift and Prone Instability Test, *J Ortho Sports Phys Ther*, 46(1):A141
14. Pontillo, M*, Ebaugh, D, Milner, C, Butowicz, C*, **Silfies, SP** Sennett, B. (2016) Relationship between Clinical and Biomechanical Testing of Core Stability in Athletes, *J Ortho Sports Phys Ther*, 46(1):A49
15. Pontillo, M*, Ebaugh, D, Milner, C, Butowicz, C*, **Silfies, SP**, Sennett, B. (2016) Comparison of Core Stability in Athletes with and without Shoulder Injuries, *J Ortho Sports Phys Ther*, 46(1):A195
16. **Silfies, SP**, Jordon M*, Beattie, P, Vendemia, J, Vendemia, S (2016) Linking Brain Activity With Changes In Trunk Movement Patterns In Patients with Recurrent and Chronic Back Pain, *J Ortho Sports Phys Ther*, 46(1):A22
17. Butowicz, C*, Milner, C, Ebaugh, D, Tomaszewski, S, **Silfies, SP** (2015). Relationships among injury history, flexibility and FMS score in college dance majors. *Medicine & Science in Sports & Exercise*, 47(5S), Suppl S549-552.
18. Pontillo, M*, Ebaugh, D, Milner, C, Butowicz, C*, **Silfies, SP** (2014). Relationships between Clinical and Biomechanical Measures of Core Stability. *Medicine & Science in Sports & Exercise*, 47(5S), Suppl S853-856.

19. Spinelli, B, **Silfies, SP**, Ebaugh, D. (2015) The relationship between shoulder pain and dysfunction and upper extremity impairments, personal factors, and fear of physical activity in women with history of breast cancer. *Rehabilitation Oncology J*, 33(1):71.
20. Spinelli, B, **Silfies, SP**, Ebaugh, D. (2015) Differences in scapula and humeral resting alignment and motion between women with a history of breast cancer treated with mastectomy or lumpectomy and radiation. *Rehabilitation Oncology J*, 33(1):71-72.
21. Hagan, J**, Maschi, R, Goodstadt, N, **Silfies, SP**. (2015) Neuromuscular Electrical Stimulation To The Lumbar Multifidus In Combination With a Novel Function-Specific Core Stabilization and Trunk Strengthening Program: A Case Report. *J Ortho Sports Phys Ther*, 45(1):A114 Citation 1
22. Roberto, M,** Goodstadt, N, **Silfies, SP**. (2015) NMES to the lumbar multifidus in conjunction with trunk stabilization exercises returns patient to a high level of competition following an L4-L5 microdiscectomy. *J Ortho Sports Phys Ther*, 45(1):A21
23. Butowicz, C*, Pontillo, M*, Milner, C, Ebaugh, D, **Silfies, SP** (2014). Relationships between Functional Movement Screen, Y-Balance Test and Biomechanical Measures of Core Stability. *Medicine & Science in Sports & Exercise*, 46(5S), S690-696, May 2014.
24. Biely, SA*, **Silfies, SP**, Smith SS, Ebaugh DD (2014) Kinematic Analysis Of Movement-Pattern Differences In Subjects With And Without Nonspecific Low Back Pain. *J Ortho Sports Phys Ther*, 44(1):A40-41
25. Roberto, M***, Sung, W*, **Silfies, SP**, Ebaugh, DD (2014) Use of NMES alone to lumbar paraspinals decreases pain while improving function and performance: a case study. *J Ortho Sports Phys Ther*, 44(1):A124
26. Biely, SA*, Wattananon P*, **Silfies, SP**, Smith SS, Ebaugh DD (2013) Trunk Aberrant Movement Patterns: Linking Instrumented Kinematics To Clinical Observation. *J Ortho Sports Phys Ther*, 43(1):A74-75
27. Sung W*, **Silfies, SP**, Wattananon, P*, Abraham M, Plastaras, C. (2012) Trunk Neuromuscular Control is Impaired in Patients with Mechanical Low Back Pain and Improves Following a Lumbar Stabilization Program, PM & R, Volume 4, Issue 10, Suppl. pp. S187-188. doi:10.1016/j.pmrj.2012.09.628
28. Spinelli, BA*, Ebaugh, DD, Pontillo, M*, Cannella, M, **Silfies, SP** (2012). Differences in Instrumented Measures in Individuals with Ideal Visual Resting Scapular Alignment and Motion and Individuals with Resting Malalignment and Aberrant Scapular Motion. *J Ortho Sports Phys Ther*, 42(1):A86
29. Biely, SA*, **Silfies, SP**, Smith, S, Hicks, G, (2012). Clinical Observation of Standing Trunk Movements: What Do the Aberrant Movement Patterns Tell Us?, *J Ortho Sports Phys Ther*, 42(1):A37-38.
30. Biely, SA*, Smith, S, Haddad, MA***, **Silfies, SP**. (2010). Reliability and Validity of Clinical Observation of Lumbo-Pelvic Rhythm, *J Ortho Sports Phys Ther*, 40(1):A 72.
31. Bhattacharya A**; Biely, S*; **Silfies, SP**. (2009) Qualitative Analysis of Lumbopelvic Movement Patterns in Individuals with Mechanical Low Back Pain: A Kinematic Study, *J Ortho Sports Phys Ther*, 39(1):A84-85.
32. Mehta, R*, Smith, S, **Silfies, SP**. (2009). Trunk Muscle Timing and Amplitude Differences in Patients with Mechanical Low Back Pain during a Self-initiated Perturbation, *J Ortho Sports Phys Ther*, 39(1):A96.
33. Biely, SA*, Ream, A***, Smith, S, **Silfies, SP**. (2009). Improvement in Trunk Movement Pattern in a Patient with Low Back Pain, *J Ortho Sports Phys Ther*, 39(1):A31.
34. El-Kerdi, A*, Mehta, R*, Bhattacharya, A*, **Silfies, SP**. (2009). Reliability of Trunk Postural Control Parameters in Unstable Sitting, *J Ortho Sports Phys Ther*, 39(1):A95.
35. Mehta, R*, **Silfies, SP**. (2007). Postural Response of Trunk Muscles in Patients with Chronic Low Back Pain, *J Ortho Sports Phys Ther*, 37(1): A 63.

36. Biely, SA*, **Silfies, SP**. (2006). Analysis of Movement Coordination of the Lumbar Spine and Pelvis in Patients with Mechanical Low Back Pain Attributed to Osteoligamentous Damage and Controls, *J Ortho Sports Phys Ther*, 36(1): A15-16. Citations 2
37. Stephens, RA,** Bhargava, A*, **Silfies, SP**. (2005). Clinical and Biomechanical Changes of Neuromuscular Impairments in a Patient with Clinical Lumbar Instability: A Case Report. *J Ortho Sports Phys Ther*, 35(1):A61
38. **Silfies, SP**, Seo, AY** (2005). Trunk Extensor Muscle Imbalances in Chronic Low Back Pain Patients with Degenerative Disc Disease. *J Ortho Sports Phys Ther*, 35(1): A8.
39. **Silfies SP**, Ebaugh DD, Karduna AR. (2000). Reliability of Surface Electromyographic Amplitude and Fatigue Parameters of Back Extensor Muscles in Healthy Adults. *J Ortho Sports Phys Ther*, 30(1):A16

Refereed Conference Proceedings * PhD Student; ** DPT, Masters or Resident, # undergraduate student, Presenter

1. Smith CR*, Hetherington A, **Silfies SP**, Stewart J (2018) Scaling of muscle activation during 3D reach actions, Neuroscience 2018, Nov 3-7, San Diego CA
2. Chen H*, Palisano R, **Silfies S**, Melvin J, Li J, Smith S. (2018). Test-Retest Reliability, Minimal Detectable Change And Convergent Validity Of The Performance-Based Balance Scale (PBS) In Community-Living Older Adults, 12th International Society of Physical and Rehabilitation Medicine World Congress, Paris: France.
3. Butowicz, C.M., **Silfies, S.P.** (2017). Lumbopelvic Postural Control System Organization is Altered in Individuals with Low Back Pain, *Proceedings of the 41th Conference of the American Society of Biomechanics*, Denver, CO,
4. Butowicz, C.M*, Pontillo, M*, Milner, C.E., Ebaugh, D., **Silfies, S.P.** (2016). Dynamic Core Stability In Athletes With And Without Non-Traumatic Shoulder Pain, *Proceedings of the 40th Conference of the American Society of Biomechanics*, Raleigh, NC,
5. Wang-Hsu, E.* Palisano, R, **Silfies, SP**, Horak, F, Gracely, E, Smith SS. (2016) Effectiveness of impairment-specific exercises to improve balance and reduce fall risk in community-dwelling older adults: a randomized controlled trial, APTA Combined Sections Meeting, Anaheim, CA.
6. Butowicz, C*, Noehren, B, Ebaugh, D, **Silfies, SP**. (2015) Relationship between Clinical and Biomechanical Measures of Core Stability. *Proceedings of the 39th Conference of the American Society of Biomechanics*, Columbus Ohio, p.647-648
7. Sung, W*, Wong, A*, Porushogi, A, Pourrezai, K, **Silfies, SP**. (2015) Predicting Isolated Lumbar Multifidus Activation during Neuromuscular Electrical Stimulation with Near Infrared Spectroscopy. *Proceedings of the 39th Conference of the American Society of Biomechanics*, Columbus Ohio, p.1117-1118
8. Davidson B, **Silfies, SP**. (2015) Systems Engineering Approach To Identifying Core Control Strategies In Individuals With And Without Low Back Pain During A Novel Unstable Sitting Task. *Proceedings of the 39th Conference of the American Society of Biomechanics*, Columbus Ohio, p.228-229
9. Butowicz, C*, Pontillo, M*, Milner, C, Ebaugh, D, **Silfies, SP** (2014). Does Functional Movement Screen Performance Correlate with Measures of Core and Lower Extremity Stability? *7th World Congress of Biomechanics*, Boston, MA,
<http://www.abstractsonline.com/Plan/ViewAbstract.aspx?sKey=f8e163f5-02b2-4c33-9246-b56516af2d94&cKey=17d95f9e-f316-4d12-8722-218146149b14&mKey=0d04d93f-3cbf-4352-9f47-e1e75f25e684>
10. Sung, W*, Wattananon, P*, Spinelli, B*, **Silfies, SP** (2014). Identification of Dynamic Trunk Movement Control Impairments in Patients with Non Specific Low Back Pain Using a Novel Target Acquisition Test. *7th World Congress of Biomechanics*, Boston, MA,
<http://www.abstractsonline.com/Plan/ViewAbstract.aspx?sKey=9bdebef4-b29d-41ae-ab44-210b189fbb73&cKey=f4d7360c-664f-44c5-a682-1da97bba3f8d&mKey=%7b0D04D93F-3CBF-4352-9F47-E1E75F25E684%7d>

11. Wattananon, P*, Sung, W*, Ebaugh, D, **Silfies, SP** (2014). Can Kinematic Data Collected During Active Forward Bending Be Used to Identify Patients with Non-Specific Low Back Pain? *7th World Congress of Biomechanics*, Boston, MA, <http://www.abstractsonline.com/Plan/ViewAbstract.aspx?sKey=f8e163f5-02b2-4c33-9246-b56516af2d94&cKey=1a15fca0-d3fe-41c2-8b4c-5a07046d405b&mKey=%7b0D04D93F-3CBF-4352-9F47-E1E75F25E684%7d>
12. Wattananon, P*, Sung, W*, Spinelli B,* Biely, S*, **Silfies, SP** (2013). Quantification of reversal of lumbopelvic rhythm during active forward bending. *Proceedings of the 37th Conference of the American Society of Biomechanics*, Omaha, NE, p. 929-30.
13. Myers, C*, Shelburne, K, **Silfies, SP**, Davidson, BS (2013). Inverse Dynamics of Unstable Sitting: The Relationship between COP and movement control for increasing task difficulty. *Proceedings of the 37th Conference of the American Society of Biomechanics*, Omaha, NE, p. 949-50.
14. Wattananon, P*, Sung, W*, Biely, S*, Cannella, M, **Silfies, SP** (2012). Preliminary Study of Changes in Trunk Forward Bend Aberrant Patterns Post Core Stabilization Intervention. *Proceedings of the 36th Conference of the American Society of Biomechanics*, Gainesville, FL, p. 1004-5.
15. Wattananon, P*, Sung, W*, Biely, S*, Cannella, M, **Silfies, SP** (2011). Inter-rater Reliability of Rating Kinematic Plots of Forward Bend Movement Patterns. *Proceedings of the 35th Conference of the American Society of Biomechanics*, Long Beach, CA, p. 812-813
16. Silfies, SP, Cannella, M, Sung, W*, Wattananon, P*, Mehta, R* (2011). Trunk Neuromuscular Control is Reduced in Patients with Clinical Lumbar Instability. *Proceedings of the 35th Conference of the American Society of Biomechanics*, Long Beach, CA, p. 892-893
17. Goodstadt, N, **Silfies, SP**. (2011). Dynamic Lumbar Stabilization Augmented by NMES gets an Intercollegiate Wrestler Back on the Mat, Pennsylvania Physical Therapy Assoc Annual Meeting, Oct. 14-16, Valley Forge, PA.
18. Canella, M, **Silfies, SP** (2010). Automatic Procedure to Remove ECG from Trunk Muscle sEMG Using Independent Component Analysis. *Proceedings of the 7th Interdisciplinary World Congress on Low Back and Pelvic Pain*, Los Angeles, CA p 536-7.
19. Mehta, R*, Canella, M, Henry, S, **Silfies, SP** (2010). Improving Characterization of Trunk Muscle Postural Response to Rapid Extremity Movements. *Proceedings of the 7th Interdisciplinary World Congress on Low Back and Pelvic Pain*, Los Angeles, CA p 573-4.
20. Biely, S*, Wattananon, P*, Smith, S, **Silfies, SP** (2010). Clinical Utility of Observations of Aberrant Movement during Standing Forward Bend Testing: Preliminary Analysis. *Proceedings of the 7th Interdisciplinary World Congress on Low Back and Pelvic Pain*, Los Angeles, CA p 581-2.
21. **Silfies, SP**, Canella, M, Wattananon, P*, Mehta, R* (2010). Dynamic Trunk Control in Unstable Sitting. *Proceedings of the 7th Interdisciplinary World Congress on Low Back and Pelvic Pain*, Los Angeles, CA p 583-4.
22. Mehta, R*, Canella, M, Henry, S, **Silfies, SP** (2010). New Approach to Characterization of Trunk Neuromuscular Response to Rapid Voluntary Extremity Movements, *Proceedings of the 34th Conference of the American Society of Biomechanics*, Providence, RI. <http://www.asbweb.org/conferences/2010/abstracts/454.pdf>
23. Wenger, S, Goodstadt, N, **Silfies, SP**. (2010). Neuromuscular Electrical Stimulation: Its Use in Treating Clinical Lumbar Instability in an Adult Female Soccer Player, Pennsylvania Physical Therapy Association Annual Meeting, Oct. 22-24, Harrisburg, PA.
24. Mehta, R*, Cannella, M, Ebaugh, D, **Silfies, SP**. (2009). Validity of Surface EMG Electrode Placement for Trunk Musculature. *Proceedings of the 33rd Conference of the American Society Biomechanics*, State College, PA. http://www.asbweb.org/conferences/2009/asb_schedule.htm Citations 3
25. Canella, M, Mehta, R*, **Silfies, SP** (2009). Piecewise Linear Approximation To Filter Force Plate Signals,

26. **Silfies, SP**, Hart, C, Cannella, M, Giszter, SF (2009). Task-Independent and Task Specific Trunk Muscle Synergies are Recruited in Bending and Reaching. *Proceedings of the XIX Conference of the International Society for Posture & Gait Research*, Bologna, Italy, p 285-6.
27. **Cannella, M**, Bhattacharya, A**, Giszter, SF, **Silfies, SP**. (2009). Trunk Control Testing using Stationary Target Paradigm. *Proceedings of the XIX Conference of the International Society for Posture & Gait Research*, Bologna, Italy, p 354-5.
28. **Silfies, SP**, Bhattacharya, A.** (2007). Trunk Control during Standing Reach: Is Control Strategy Altered by Mechanical Low Back Pain? *6th Interdisciplinary World Congress of Low Back and Pelvic Pain. Conference Proceedings*, Barcelona, Spain, November 7-10.
29. **Biely, SA***, Smith, S, **Silfies, SP**. (2007). Reliability of Kinematic Measures of Trunk Motion: A Pilot Study. Northeast Conference, *American Society of Biomechanics*, University of Maryland, MD, March 30-31. <http://www.hhp.umd.edu/KNES/faculty/jkshim/NEASB/abstracts/36%20-40.pdf>
30. **El-Kerdi, A***, Smith, S, **Silfies, SP**. (2007). Reliability and Precision of Trunk Postural Control Parameters during Seated Balance. Northeast Conference, *American Society of Biomechanics*, University of Maryland, MD, March 30-31. <http://www.hhp.umd.edu/KNES/faculty/jkshim/NEASB/abstracts/36%20-40.pdf>
31. **Silfies, SP**, Cholewicki, J, Reeves, NP*, Greene, HS. (2006). Lumbar proprioception and low back injury in college athletes. *Proc. 33rd Annual Meeting, International Society for the Study of the Lumbar Spine (ISSLS)*, Bergen, Norway, June 13-17, 2006.
32. **Reeves, NP***, Cholewicki, J, **Silfies, SP**, Morrisette, D. (2006). Preparatory trunk muscle activity reduces the risk of low back injury. Paper presented at the *International Society for the Study of the Lumbar Spine, 33rd Annual Meeting Conference Proceedings*.
33. **Cholewicki, J**, **Silfies, SP**, Shah, RA, Greene, HS, Reeves, NP*, Alvi, K, Goldberg, B . (2005) ISSLS Prize 2005: Delayed Trunk Muscle Reflex Responses Increase the Risk of Low Back Injuries. Paper presented at the *International Society for the Study of the Lumbar Spine, 32nd Annual Meeting Conference Proceedings*, p. 63.
34. **Silfies, SP**, Karduna A. (2004) Trunk Muscle Activation Patterns in Individuals with Degenerative Disc Disease: A Comparison of Individuals with And without Low Back Pain; Paper presented at the *American Society of Biomechanics, 28th Annual Meeting Conference Proceedings*, Portland, OR. September 8-12.
35. **Silfies, SP**, Reeves, NP*, Cholewicki, J, Milner, TE. (2003) Trembling, Rambling and Random Walk Analysis in Postural Control during Seated Balance. Paper presented at the *American Society of Biomechanics*, Toledo, OH, September 24-27.
36. **Smith HL****, **Silfies, SP**. (2002). The use of dynamic lumbar stabilization exercise in acute low back pain: a case study, Pennsylvania Physical Therapy Association Annual Meeting, Harrisburg, PA.
37. **Michener, L**, **Silfies, SP**, Hutchinson, D, McClure, P. (1997). Accuracy of the Metrecom Skeletal Analysis System in Determining Linear and Angular Measures, Combined Sections Meeting APTA, Dallas, Texas, Feb

Book Chapters

1. Cholewicki, J, **Silfies, SP**. (2005). Clinical Biomechanics of the Lumbar Spine. *Greive's Modern Manual Therapy: The Vertebral Column*. J. Boyling and G. Jull. Philadelphia, Churchill Livingstone, 67-88. (ISBN: 0443071551) Citations 3
2. Clinical Cases in Physical Therapy, Butterworth and Heinemann, M Moran and M Brimer eds., 1995 (contributor)

Seminars

1. Lumbar Spine Motor Control and Movement Impairment Pathway
Treating the Cervical and Lumbar Spine: Can Art, Science and Practice Guidelines All Get Along?
American Physical Therapy Association; Annual Orthopaedic Section Meeting, Atlanta, GA, May 5-7, 2016

Research Presentation

1. **Silfies SP**, Butowicz C, Camp A, Hendershot B, Davidson B. (2019) Characterizing Motor Planning and Feedback Control Strategies in Individuals with Recurrent Low Back Pain, International Society of Biomechanics/ American Society of Biomechanics, Calgary, CN July 31, 2019
2. **Silfies SP**. Improvements in Trunk Neuromuscular Control in Patients with Non-specific Low Back Pain Following a Core Stabilization Program, NIH Pain Consortium 2011, Bethesda, MD, April 14, 2011
3. **Silfies SP** Dynamic Trunk Control in Unstable Sitting. 6th Annual Philadelphia Spine Symposium, December 14, 2010.
4. **Silfies SP**, Biely S. Clinical Utility of Observations of Aberrant Movement during Standing Forward Bend Testing: Preliminary Analysis. 6th Annual Philadelphia Spine Symposium, December 14, 2010.
5. **Silfies, SP**, Seo, AY*** (2005). Trunk Extensor Muscle Imbalances in Chronic Low Back Pain Patients with Degenerative Disc Disease. *APTA Combined Sections Meeting*, New Orleans, LA
6. **Silfies SP**, Karduna A. (2003). Muscle Fatigue and Spinal Instability: An Electromyographic Study, Paper presented at *World Congress of Biomechanics*, 39. <http://www.asb-biomech.org/onlineabs/2002.html>
7. **Silfies SP**, Karduna A. (2001). In-vivo Assessment of Panjabi's Theory of Spinal Instability Using EMG. Paper presented at the *North American Spine Society, 16th Annual Meeting Conference Proceedings*, pp 179-181.
8. **Silfies SP**, Ebaugh, DD, Pratt, NE. (1998) Depth of Soft Tissue and Skeletal Structures in the Upper Cervical Spine, APTA Scientific Meeting and Exposition, Orlando, FL, June 4-8

Invited Presentations and Lectures

1. Biomechanical and Clinical Measures of Core Stability. University of Denver, Neural Control of Movement Seminar Course, Feb 1, 2016
2. The Role of Trunk Neuromuscular Control in LBP and Athletic Injuries. University of South Carolina, Arnold School of Public Health, Seminar Series, April 17, 2015.
3. Recurrent Low Back Pain: Linking Mechanism to Outcomes. University of South Carolina, School of Medicine, Columbia, SC, February 16, 2015.
4. Core Stability and Athletic Injuries. University of South Carolina Graduate and SOM Sports Medicine Seminar, Columbia, SC, February 9, 2015.
5. Trunk Neuromuscular Control in Non-specific Low Back Pain and Athletic Injuries, Brotz Seminar Series, Marquette University, Milwaukee, WI, December 6-7, 2012
6. Clinical Lumbar Instability: Current Best Evidence, Good Shepherd Penn Partners, Penn Therapy & Fitness, Philadelphia, PA, July 2010
7. The ICF Model: Mechanical Low Back Pain, Good Shepherd Penn Partners, Penn Therapy & Fitness, Philadelphia, PA, March 2010

8. Clinical Decision Making, NE District Pennsylvania Physical Therapy Association, Easton, PA, October, 2002.
9. Spinal Diagnostic Imaging, University of the Sciences, Physical Therapy Program, Philadelphia, September 2000.
10. Evaluation of Spinal Dysfunction, University of the Sciences, Physical Therapy Program, Philadelphia, October 2000.

PATENT AND TECHNOLOGY TRANSFER:

International Patent Application– PCT/US17 /22398 Portable Load Testing Device	3/15/2017
U.S. Provisional Patent Application– 62/423,261	3/16/2016, 11/17/2016
U.S. Patent Application-16073657 Portable Load Testing Device	1/31/2019

PROFESSIONAL SERVICE:

Journal Editorial Board

Pain Medicine, Editorial Board Member	2014-2015
Pain Medicine, Section Co-editor, Rehabilitation Section	2015-

Manuscript Reviewer

Applied Bionics and Biomechanics	2004- 2010
Pain Medicine	2004 -
Archives of Physical Medicine and Rehabilitation	2006 -
Physiotherapy Theory and Practice	2006 -
Journal of Athletic Training	2007 -
Clinical Biomechanics	2008 -
Gait & Posture	2008 -
Human Movement Science	2010 -
Journal of Applied Biomechanics	2011 -
Journal of Back and Musculoskeletal Rehab	2011 -
Journal of Electromyography & Kinesiology	2013 -
Applied Ergonomics	2013 -
Journal Biomechanics	2013 -
PlusOne	2015 -
Sports Medicine	2015 -
Experimental Brain Research	2015 -

Reviewer for Grant Proposal

APTA Scientific Review Committee -Clinical Practice Guidelines	2013 -
Academy of Orthopaedic Physical Therapy	2008- 2013
Technology Foundation STW, Netherlands	2016
KU Leuven University	2014-2017

Review for Professional Monographs

Academy of Orthopedic Phys Ther Orthopaedic Monographs	2017-
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Membership in Scientific/Professional Societies

American Physical Therapy Association	1987 -
APTA Section on Research	2001 -
Academy of Orthopedic Physical Therapy	1988 -
American Academy of Sports Physical Therapy	2013 -
American Society of Biomechanics	2004 -
International Society of Posture and Gait Research	2008 - 2013

American College of Sports Medicine	2012-
North American Spine Society	2015 - 2017
Pennsylvania Physical Therapy Association	1987 - 2002
Chair, Membership Committee of NE District	1995 - 1997
Delaware Physical Therapy Association	2002 - 2018
North Carolina Physical Therapy Association	2018-

Positions Held In Professional Societies

American College of Sports Medicine	
Abstract Reviewer for Annual Conference	2016-
American Society of Biomechanics	
Conference Program Committee	2016
Abstract Reviewer for Annual Conference	2016-
Academy of Orthopedic Physical Therapy	
Clinical Practice Guideline Low Back Pain Revision Team	2016-
Research Committee	2003 - 2007
Abstract Reviewer for Combined Section Meeting	2001 -
APTA Section on Research	
Scientific Reviewer, Abstract Review Committee	2008 - 2011
Ad Hoc Abstract Reviewer	2010 - 2014

UNIVERSITY SERVICE:**University of South Carolina**

Discovery Day Research Judge	2019-
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Arnold School of Public Health

BBIP Mentor	2019
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Depart of Exercise Science

PhD Admissions and Curriculum Committee	2018-
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Program in Physical Therapy

Admissions Committee	2018-
Curriculum Committee	2018-
Accreditation Committee	2018
Faculty Search Committee	2019-

Drexel University

Drexel Research Day Judge	2004 - 2014
Faculty Senate Representative (Alternate)	2007 - 2010
Human Subjects Institutional Review Board IRB #1(member)	2008 - 2012
Human Research Protection, IRB #3 (member)	2012 - 2018
Lab Safety Committee (member)	2012 - 2015

Drexel College Nursing and Health Professions

Bylaws Committee (member)	2003 - 2006
Search Committee, Associate Vice Provost for Research	2009
Search Committee, Vice Provost for Research	2010
Research Committee (member)	2010- 2014
Clinical Practice Advisory Committee (member)	2012- 2014
Tenure and Promotions Committee (member)	2015 -2018

Department of Physical Therapy & Rehabilitation Sciences

Curriculum Committee (DPT). (chair)	2003 - 2006
PhD / DHSc Curriculum Committees	2004 - 2018
Faculty Advocacy Committee	2004 - 2014
PhD Student Scholarship Committee	2004 - 2018
Publicity and Marketing Committee	2004 - 2006
Equipment and Technology Committee	2006 - 2008
Program Assessment and Realignment Committee	2015 - 2016
Faculty Search Committees	
Tenure-track position (chair)	2003- 2004
Tenure-track position (member)	2007- 2008
Tenure-track position (chair)	2007- 2008
Tenure-track position (member)	2011- 2012
Tenure-track position (member)	2012- 2014
Joint tenure-track position (BME, member)	2012- 2014
Department Chair (chair)	2013- 2015

SPSCV
Updated: 1/26/2020