OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

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NAME: Sheri P. Silfies

eRA COMMONS USER NAME (credential, e.g., agency login): SILFIES1

POSITION TITLE: Associate Professor

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)

| INSTITUTION AND LOCATION | DEGREE(if applicable) | Completion DateMM/YYYY | FIELD OF STUDY |
| --- | --- | --- | --- |
| University of Scranton, Scranton, PA | BS | 05/1987 | Physical Therapy |
| Indiana University of Pennsylvania, Indiana, PA  | MS | 08/1994 | Exercise Physiology |
| MCP Hahnemann University, Philadelphia, PAYale University, New Haven, CT | PhDPost Doc | 08/20026/2003 | Rehabilitation SciencesSpine Biomechanics/ Motor Control |

**A. Personal Statement**

My research interests are in the areas of musculoskeletal low back pain, motor control, and core stability in athletes. My background also includes advanced clinical training and certification, and 25 years of clinical experience treating individuals with musculoskeletal back pain. My research has strongly contributed to supporting connections between impairments in trunk neuromuscular control and LBP. Findings from these studies have contributed to body of knowledge and support the suggestion that unresolved trunk neuromuscular impairments are contributing to recurrent and chronic symptoms. However, despite considerable work in this area, current measures of neuromuscular control are limited to individual aspects of control (e.g., muscle timing, proprioception) rather than modeling the behavior of the system (trunk/pelvis) and identifying key control parameters. My lab is exploring **innovative approaches for assessment of movement control (dynamic systems) and muscle synergies (independent component analysis) in patients with LBP. These approaches begin to move beyond assessing individual parameters of trunk neuromuscular control to indirectly assessing how the motor system functions and what changes about the system in patients with back pain.** Using a novel seated task, we can capture the behavior of the complex neuromuscular control of the trunk and pelvis by challenging both volitional control of posture and directed movement in an isolated manner. We are using data collected during this task to explore a unique modeling approach to elucidating mechanisms of poor trunk neuromuscular control. Our research in the area of core stability in athletes and it’s association to athletic injury is a recent addition to the lab. We adapted our methods for assessing trunk neuromuscular control to the athletic population and just completing work assessing core stability status in athletes with non-traumatic shoulder injuries.

**B. Position and Honors**

**Positions and Employment**

1987-1988 Physical Therapist, East Hills Rehabilitation and Fitness Institute, Johnstown, PA

1988-1992 Physical Therapist, Allegheny & Chesapeake Physical Therapist, Inc., Johnstown, PA

1992-1999 Physical Therapist, Allied Services, Scranton, PA

1992-1999 Assistant Professor, College Misericordia, Physical Therapy Department, Dallas, PA

1999-2002 Assistant Professor, MCP Hahnemann University, Department of Rehabilitation Sciences, Philadelphia, PA

2002-2003 Postdoctoral Associate, Yale University School of Medicine, Department of Orthopedics and Rehabilitation, New Haven, CT

2003-2004 Research Associate, Yale University School of Medicine, Department of Orthopedics and Rehabilitation, New Haven, CT

2003-2009 Assistant Professor, Drexel University, Physical Therapy and Rehabilitation Sciences, Philadelphia, PA (Tenure-Track Position)

2005- Director of Rehabilitation Sciences Research Laboratories, Drexel University, Philadelphia, PA

2009- Associate Professor, Drexel University, Physical Therapy and Rehabilitation Sciences, Philadelphia, PA

2014-2015 Visiting Professor, University of South Carolina, Department of Physical Therapy, Columbia, SC

2014-2015 Visiting Professor, University of Denver, Mechanical and Materials Engineering, Denver, CO

**Other Experience and Professional Societies**

1987- Member, American Physical Therapy Association (APTA)

2004- Member, American Society of Biomechanics

2006- Manuscript reviewer: *Pain Medicine, Archives of Physical Medicine and Rehabilitation, Clinical Biomechanics, Gait and Posture, Human Movement Science, Journal of Back and Musculoskeletal Rehabilitation*

2008-2013 Scientific Review Committee, Orthopaedic Section, APTA

2013- Scientific Review Committee, Clinical Practice Guidelines, APTA

2014-2015 Editorial Board Member, *Pain Medicine*

2015- Associate Editor, *Pain Medicine*

**Honors**

2005 International Society for the Study of the Lumbar Spine (ISSLS) Bioengineering Prize Award

2014 American Physical Therapy Association, Research Section, Traveling Fellowship Award

**C. Contribution to Science**

Butowicz, C\*, Ebaugh, DD, Noehren, B, **Silfies, SP**. (2016) Validation of Two Clinical Measures of Core Stability. *Int J Sports Phys Ther* (in press)

Mehta, R \*, Cannella, M, Henry, S, Smith, S, Giszter, S, **Silfies, SP**. (2016) Trunk Postural Muscle Timing Is Not Compromised In Low Back Pain Patients Clinically Diagnosed with Movement Coordination Impairments, *Motor Control* (in press)

**Silfies, SP**, Ebaugh, DD, Pontillo, M, Butowizc, 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

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

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.

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>

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 The*r. 2014; 44(4):263-273. PubMed PMID: 2445037

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.

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.

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.

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*, Gainsville, FL, p. 1004-5.

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

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

Silfies, SP, Canella, M, Wattananon, P, Mehta, R (2010). Dynamic Trunk Control in Unstable Sitting. *Proceeding of the 7th Interdisciplinary World Congress on Low Back and Pelvic Pain*, Los Angeles, CA p 583-4.

**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.

**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.

**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

**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>

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.

Biely, SA**\***, Smith, SS, **Silfies, SP**. (2006) Clinical Update: Assessment and Treatment of Clinical Spinal Instability, *Orthopedic Practice*, 18(3):11-18.

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.

**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.

**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.

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.

**A Complete List of my Published Work in My Bibliography:**

**http://www.ncbi.nlm.nih.gov/sites/myncbi/sheri.silfies.1/bibliography/40221535/public/?sort=date&direction=ascending**

**D. Research Support**

**Ongoing**

Legacy Fund Grant Silfies (Co-PI) 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

ExCITE Seed Funding Silfies (Co-PI) 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-PI

ASPIRE Grant Campbell- Stewart (PI) 5/2015-8/2016

University of South Carolina

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

Role: Consultant

**Completed Research Support**

Visiting Professor Grant Fritz, Beattie (PIs) 1/2015-6/2015

University of South Carolina

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

Role: Co-Investigator

Clinical Research Grant Program Ebaugh (PI) 6/2011-8/2014

Orthopaedic Section, American Physical Therapy Association

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

K01 HD053632 (NICHD) Silfies (PI) 6/2007-5/2012

Recurrent Low Back Pain: Linking Mechanism to Outcomes

The goals of this project were 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