

Joseph A. Zeni, Jr., PT, PhD

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LICENSURE

Delaware Physical Therapist #: J1-0002049

EDUCATION

Quinnipiac University – 2001 – BS – Health Science
Quinnipiac University – 2003 – MPT – Physical Therapy
University of Delaware – 2008 – PhD – Biomechanics and Movement Science
University of Delaware – 2009 – Post-Doc – Clinical Outcomes Research

CURRENT APPOINTMENT

Assistant Professor

University of Delaware - Dept. of Physical Therapy, Newark, DE: 2009-present

Assistant Professor (Secondary Appointment)

University of Delaware – Biomechanics and Movement Science: 2009- present

PROFESSIONAL HISTORY

Research Assistant and Laboratory Coordinator

University of Delaware – Dept. of Mechanical Engineering, Newark, DE: 2005-2008

Staff and Per Diem Physical Therapist

Rubin Institute for Advanced Orthopaedics – Baltimore, MD: 2003-2008

AWARDS AND HONORS

2011 Comprehensive Opportunities in Rehabilitation Research Training (CORRT) Scholar
2010 Rose Excellence in Research Award: APTA
2010 Faculty Member for 3rd Annual Delaware Orthopaedic Symposium
2009 New Investigator Research Award (Finalist) – Orthopaedic Research Society

RESEARCH AND GRANTS

Research Interests

Investigations into the biomechanical factors that result in the progression of osteoarthritis and treatment interventions aimed at reducing disability associated with knee pathology. Particular interest in altered movement patterns after total joint replacement and the relationship to disease progression in the non-

operated limb. Currently working on innovative and engaging physical therapy interventions to reduce movement asymmetry after total joint replacement and maximize long-term functional outcomes.

1. **(2011) Principal Investigator: K12 HD055931-** Maximizing Functional and Biomechanical Outcomes after Total Knee Arthroplasty. *Funded 9/1/11*
2. **(2010) Principal Investigator: Pilot Project Grant from NIH P20-RR16458-** Comparison of Methods of Viscosupplementation on Function and Pain in Patients with Knee Osteoarthritis. *Funded 1/1/10*
3. **(2009) Co-investigator: Supplemental Grant to NIH P20-RR16458** – Joint loading and the progression of osteoarthritis. *Funded 9/1/09*

STUDENTS AND TRAINEES

MENTEES

1. MS Co-advisor – Kevin McGinnis, BS: University of Delaware BIOMS MS Program (graduated 2011)
2. PhD Co-advisor – Portia Flowers, MS: University of Delaware BIOMS PhD program (Currently Enrolled)
3. PhD Advisor – Federico Pozzi, MS: University of Delaware BIOMS PhD Program (Currently Enrolled)
4. PhD Advisor – Sumayeh Abujaber, MS: University of Delaware BIOMS PhD Program (Currently Enrolled)
5. On-site Advisor – Alexandra Lambert, Peter White Fellow (1 credit, 2011)
6. On-site Advisor – Katherine McWilliams, Peter White Fellow (3 credits, 2011)
7. On-site Advisor – Joshua Winters, PhD, University of Delaware BIOMS Program (Currently Enrolled)

THESIS COMMITTEES

1. Kevin McGinnis – MS Thesis: *Dynamic Joint Stiffness And Co-Contraction In Subjects After Total Knee Arthroplasty* (2011)
2. Stephen Suydam – MS Thesis: *Ballistic movements: A unique approach to EMG normalization and its effect on joint moment estimation* (2011)
3. Ali Alnahdi - PhD Thesis: *Altered Loading and Quadriceps Strength after Unilateral Total Knee Arthroplasty* (Expected Graduation 2012)
4. Tyler Richardson – MS Thesis: *Evaluation Of Interlimb Symmetry In Individuals With Knee Osteoarthritis During Gait* (Expected Graduation 2012)

SERVICE

AD-HOC REVIEWER

Physical Therapy Journal
Journal of Orthopedic Research
Journal of Biomechanics
Clinical Biomechanics
Arthritis Care and Research
Gait and Posture Journal
Age
Medical Engineering and Physics Journal

Complementary Therapies in Medicine Journal
American Society of Biomechanics Annual Meeting
Journal of Rehabilitation Research and Development
Reumafonds (Dutch Arthritis Association)
Saudi Medical Journal
BioMed Central Musculoskeletal Disorders
Archives of Physical Medicine
Orthopaedic Research Society Annual Meeting
Bupa Foundation Medical Research Charity Grant Reviewer
British Medical Bulletin
Journal of Applied Biomechanics

PROFESSIONAL ORGANIZATION AND SOCIETIES

PROFESSIONAL MEMBERSHIP

American Physical Therapy Association
American Society of Biomechanics
Osteoarthritis and Research Society International
Orthopedic Research Society

TEACHING

Course Instructor: Clinical Gross Anatomy (PHYT 622)

Course Instructor: Functional Anatomy and Biomechanics (PHYT604)

Course Instructor: Advanced Regional Anatomy (PHYT626)

PUBLICATIONS

1. **Zeni J**, Richards JG, Higginson JS (2008). *Two simple methods for determining gait events during treadmill and overground walking using kinematic data.* Gait Posture 27(4): 710-4.
2. **Zeni J** and Higginson, JS. (2009) *Differences in gait parameters between healthy subjects and persons with moderate and severe knee osteoarthritis: A result of altered walking speed?* Clinical Biomechanics 24(4): 372-8. doi:10.1016/j.clinbiomech.2009.02.001
3. **Zeni J** and Higginson, JS. (2009) *Dynamic knee joint stiffness in persons with a progressive increase in severity of knee osteoarthritis.* Clinical Biomechanics. 24(4): 366-71. doi:10.1016/j.clinbiomech.2009.01.005
4. **Zeni J**, Snyder-Mackler, L. (2009) *Clinical outcomes following simultaneous bilateral knee replacement: A two year prospective study.* Journal of Arthroplasty. Published online. doi:10.1016/j.arth.2009.02.016
5. **Zeni J**, Rudolph K and Higginson JS. (2010) *Alterations of quadriceps and hamstring coordination is present in persons with medial compartment knee osteoarthritis.* Journal of Electromyography and Kinesiology. 20(10): 148-54. doi:10.1016/j.jelekin.2008.12.003
6. **Zeni J**, Snyder-Mackler, L. (2010) *Early Post-operative function predicts long term outcomes after total knee replacement: The importance of contralateral limb strength.* Physical Therapy Journal. 80(1): 43-54 doi:10.2522/ptj.20090089. **(Rose Excellence in Research Award Paper)**
7. **Zeni J**, Snyder-Mackler, L. (2010) *Most Patients Gain Weight in the Two Years After Total Knee Arthroplasty: Comparison to a Healthy Control Group.* Osteoarthritis and Cartilage. 18(4): 510-514 doi:10.1016/j.joca.2009.12.005

8. **Zeni J** and Higginson, JS. (2010) *Gait parameters and stride-to-stride variability during familiarization to walking on a split-belt treadmill*. Clinical Biomechanics. 25(4): 383-386 doi:10.1016/j.clinbiomech.2009.11.002
9. **Zeni J**, Snyder-Mackler, L. (2010) *Pre-operative predictors of stair climbing ability after total knee replacement*. Journal of Bone and Joint Surgery. 92: 1130-1136 doi:10.2106/JBJS.I.00299
10. **Zeni J**, Snyder-Mackler, L. (2010) *Clinical predictors of elective total joint replacement in persons with end-stage knee osteoarthritis*. BMC Musculoskeletal Disorders. 86(11): doi:10.1186/1471-2474-11-86
11. Mizner R, Petterson S, Clements K, **Zeni J**, Irrgang J, Snyder-Mackler L. (2010) *Measuring Functional Improvement after Total Knee Arthroplasty Requires both Performance-Based and Patient-Report Assessments: A Longitudinal Analysis of Outcomes*. Journal of Arthroplasty. Aug;26(5):728-37. PMID: 20851566; PMC3008304.
12. **Zeni J** and Higginson, JS. (2011) *Knee osteoarthritis affects the distribution of joint moments during gait*. The Knee. Jun;18(3):156-9. doi:10.1016/j.knee.2010.04.003
13. Alnahdi A, **Zeni J**, Snyder-Mackler L. (2011) *Gait after unilateral total knee arthroplasty*. Journal of Orthopaedic Research. May;29(5):647-52. doi: 10.1002/jor.21323. PMID: 21184513.
14. Hartigan EH, **Zeni J Jr**, Di Stasi S, Axe MJ, Snyder-Mackler L. (2011) *Preoperative Predictors for Non-Copers to Pass Return to Sports Criteria After ACL Reconstruction*. J Appl Biomech. Jul 29. [Epub ahead of print]
15. Nazarian DG, **Zeni J**. (2011) *Management of a pelvic mass following a worn uncemented total hip arthroplasty*. J Arthroplasty. 2012 Feb;27(2):323.e17-20. May 6 2011. [Epub ahead of print]
16. McClelland JA, **Zeni, JA**, Haley R, Snyder-Mackler L. (2012) *Functional and Biomechanical Improvement in a Patient after Total Knee Arthroplasty: The Benefits of Symmetry Retraining*. Journal of Orthopaedic and Sports Physical Therapy

PRESENTATIONS

1. DeGennaro S and **Zeni J**. *The Effects of Strain and Counterstrain versus Muscle Energy Technique on Hamstring Extensibility*. Connecticut Physical Therapy Association Annual Meeting, Hartford, CT November, 2002.
2. Bhavé A, Mont M, Brown C, **Zeni J**, Tennis S, Etienne G. *A New Cost Effective Customized Knee Device for Knee Flexion Contractures in Patients who had Undergone Total Knee Arthroplasty*. American Physical Therapy Combined Sections Meeting. Boston, MA 2005.
3. **Zeni J**, Higginson JS. *Familiarization to Treadmill Walking: Kinetic, Kinematic and Temporospacial Parameters*. NIH IDEa Conference. Washington, DC 2006.
4. **Zeni J**, Higginson JS. *Familiarization to Walking on a Split-Belt Treadmill: Kinetic, Kinematic and Temporospacial Parameters*. American Society of Biomechanics Conference. Blacksburg, VA 2006.
5. **Zeni J**, Higginson JS. *Influence of Walking Speed and Severity of Knee Osteoarthritis on Medial Compartment Loading*. American Society of Mechanical Engineering Bioengineering Conference. Keystone, CO 2007.
6. **Zeni J**, Higginson JS. *Estimation of knee joint compression force in subjects with medial compartment knee osteoarthritis*. American Society of Biomechanics Annual Conference, Palo Alto CA 2007.
7. **Zeni J**, Higginson JS. *Influence of speed on kinetics and coordination in knee osteoarthritis*. Northeast American Society of Biomechanics Meeting. College Park, MD 2007.
8. **Zeni J**, Higginson JS. *Dynamic knee joint stiffness in persons with medial compartment knee osteoarthritis*. CBER Day. Newark, DE 2008.
9. **Zeni J**, Snyder-Mackler, L. *Most persons gain weight following primary total knee arthroplasty*. Orthopedic Research Society Annual Meeting. Las Vegas, NV 2009

10. Kubinski A, **Zeni J**, Higginson JS. *Compensations to a weighted walking challenge among varying osteoarthritis severities*. Orthopedic Research Society Annual Meeting. Las Vegas, NV 2009
11. **Zeni J**, Snyder-Mackler, L. *Clinical predictors of elective total knee replacement in persons with end-stage knee osteoarthritis*. CBER Day. Newark DE 2009
12. Richards C, **Zeni J**, Higginson JS. *Two methods to determine muscle forces and joint contact force: Comparison to experimental muscle activity*. American Society of Biomechanics Annual Meeting, State College, PA 2009.
13. **Zeni J**, Higginson JS. *The effects of gait speed on kinetic and kinematic variables in persons with varying severity of knee osteoarthritis*. OARSI Annual Meeting, Montreal, Quebec 2009.
14. **Zeni J**, Snyder-Mackler L. *Clinical predictors of elective joint replacement in persons with end-stage knee osteoarthritis*. OARSI Annual Meeting, Montreal, Quebec 2009.
15. **Zeni J**, Snyder-Mackler L. *Early post-operative measures predict one and two year outcomes after unilateral total knee arthroplasty: the importance of contralateral limb strength*. OARSI Annual Meeting, Montreal, Quebec 2009.
16. Hartigan E, **Zeni J**, DiStasi S, Snyder-Mackler L. *Pre-operative Predictors for Non-copers to Return to Sport Post-operatively*. APTA Combined Sections Meeting, San Diego, CA 2010.
17. Bade M, Wolfe P, **Zeni J**, Stevens-Lapsley J, Snyder-Mackler L. *Determination of optimal timing for total knee arthroplasty using preoperative clinical measures*. APTA Combined Section Meeting, San Diego, CA 2010
18. **Zeni J**, Snyder-Mackler L. *Revised Views on the Timing for TKA and Rehabilitation Protocols*. ORS Annual Meeting, New Orleans 2010.
19. Farquhar S, **Zeni J**, Snyder-Mackler L. *Linking Frontal Plane Mechanics during Stair Climbing to the Progression of Osteoarthritis in the Nonoperated Knee after Unilateral Total Knee Arthroplasty*. ORS Annual Meeting, New Orleans 2010
20. **Zeni J**, Snyder-Mackler L. *Preoperative Predictors of Persistent Stair-Climbing Impairment after TKA*. AAOS Annual Meeting, New Orleans 2010.
21. **Zeni J**, Snyder-Mackler L. *Post-operative Rehabilitation Following Total Knee Arthroplasty Should Include Weight Management*. ACSM Annual Meeting, Baltimore MD 2010.
22. **Zeni J**, Snyder-Mackler L. *The Delaware Osteoarthritis Profile: a comprehensive evaluation of disability and recovery*. OARSI Annual Meeting, Brussels, Belgium 2010
23. **Zeni J**, Snyder-Mackler L. *Revised views on the timing and rehabilitation for total knee arthroplasty*. OARSI Annual Meeting, Brussels, Belgium 2010
24. Alnahdi A, **Zeni JA**, McGinnis K, Snyder-Mackler L. *Gait After Unilateral Total Knee Arthroplasty: Frontal Plane Analysis*. ASB Meeting 2010, Providence, RI.
25. McGinnis K, **Zeni J**, Alnahdi, A, Snyder-Mackler, L. *Dynamic Knee Joint Stiffness and Knee Joint Moment After TKA*. ASB Meeting 2010, Providence, RI.
26. Alnahdi A, McClelland J, **Zeni J**, Snyder-Mackler L. *Quadriceps Strength and Gait after Unilateral Total Knee Arthroplasty*. ORS Meeting 2011, Long Beach, CA.
27. McClelland J, **Zeni J**, Marmon A, Snyder-Mackler. *Quadriceps strength is the best predictor of unilateral balance test two years following total knee arthroplasty*. APTA Combined Sections Meeting, New Orleans 2011
28. Alnahdi A, **Zeni J**, Snyder-Mackler. *Interlimb loading differences during sit to stand task after TKA*. APTA Combined Sections Meeting, New Orleans 2011
29. **Zeni J**, Alnahdi A, McGinnis K, Snyder-Mackler L. *Normative Sample for the Delaware Osteoarthritis Profile in Patients Pre- and Post- Total Knee Arthroplasty*. APTA Combined Sections Meeting, New Orleans 2011
30. Marmon AR, **Zeni JA Jr**. *Perception and Presentation of Function; Implications for Arthroplasty in Knee Osteoarthritis*. ACSM National Conference, in Medicine & Science in Sports & Exercise., May 2011.

31. **Zeni J**, Beeson H, Axe M, Snyder-Mackler. *Comparison of two hyaluronic acid formulations on functional outcomes in patients with knee osteoarthritis*. OARSI Annual Meeting, San Diego 2011
32. **Zeni J**, McClelland J, Snyder-Mackler. *A novel rehabilitation paradigm to improve movement symmetry and maximize long-term outcomes after total knee arthroplasty*. OARSI Annual Meeting, San Diego 2011
33. Logerstedt D, **Zeni J**, Snyder-Mackler L. *Functional performance and patient-reported knee function one year after total knee arthroplasty*. ESSKA, Geneva 2012