

Curriculum Vitae

Jonathan H. Rylander, Ph.D

CONTACT INFORMATION

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CURRENT RANK: Assistant Professor
DEPARTMENT: Mechanical Engineering

RESEARCH INTERESTS

- To characterize the underlying injury mechanisms for orthopaedic problems such as Femoroacetabular Impingement and Osteoarthritis
- To develop/assess treatment interventions for orthopaedic conditions through innovative, objective, quantifiable methods
- To identify early detection/risk markers for orthopaedic conditions
- To refine/develop new devices that could aid in prevention and treatment for orthopaedic conditions

EDUCATION AND TRAINING

Post Doctoral Researcher: (2012-2014) Department of Kinesiology and Health Education, University of Texas at Austin, TX.
Department of Orthopaedics and Rehabilitation, Center for the Intrepid, Brooke Army Medical Center, San Antonio, TX

Advisors: Jonathan Dingwell (UT Austin)
Jason Wilken (CFI San Antonio)

Ph.D. (2005 – 2012) Mechanical Engineering, School of Engineering, Stanford University, CA. Degree Conferral September 2012.
Dissertation: Functional Testing Provides Unique Insights into the Pathomechanics of Femoroacetabular Impingement and an Objective Basis for Evaluating Treatment Outcome.

Advisors: Thomas Andriacchi, PhD
Marc Safran, MD

Masters of Science (2005 – 2007) Mechanical Engineering, School of Engineering, Stanford University, CA. Degree Conferral June 2007.

Advisor: Thomas Andriacchi, PhD

Bachelor of Science (2001 – 2005) Mechanical Engineering, Cockrell School of Engineering, The University of Texas at Austin, TX. Degree Conferral May 2005.

RESEARCH POSITIONS

- Research Assistant** (October 2011-January 2012) BioMotion Lab, Mechanical Engineering, School of Engineering, Stanford University, CA.
- Pre-Doctoral Fellow/
Biomeccical Engineer** (July 2007-October 2011) Bone and Joint Research and Rehabilitation Center, Veterans Affairs Palo Alto Health Care System, CA.
- Honors Intern Researcher** (May 2004-August 2004) Applied Research Laboratories, Austin Texas

TEACHING EXPERIENCE

- Guest Lecturer** (September 2013) Department of Kinesiology and Health Education, The University of Texas at Austin: KIN326K: Biomechanical Analysis of Movement. Instructor: Dr. Jonathan Dingwell
- Teaching Assistant
Guest Lecturer** (January 2012-June 2012, January 2009- June 2009, January 2007- June 2007) Department of Mechanical Engineering, Stanford University: ME382A/B: BioMedical Device Design and Evaluation. Instructor: Dr. Thomas Andriacchi
- Teaching Assistant
Guest Lecturer** (January 2008- June 2008) Department of Mechanical Engineering, Stanford University: ME280: Skeletal Development and Evolution. Instructor: Dr. Dennis Carter
- Grader** (September 2003-December 2003) Department of Mechanical Engineering, University of Texas at Austin: ME 136L: Materials Engineering Laboratory. Instructor: Dr. Desiderio Kovar
- Grader** (September 2003-December 2003) Department of Mechanical Engineering, University of Texas at Austin: ME 336: Materials Processing. Instructor: Dr. David Bourell
- Curriculum Development** (March 2012) Completed Engr 312: Science and Engineering Course Design. Instructors Dr. Robyn Dunbar, Dr. Sheri Sheppard

SCHOLARSHIPS AND AWARDS

- 2012 ORS William H. Harris, MD Award
Orthopaedic Research Society, San Francisco, CA
- 2009-2011 VA Pre-Doctoral Associated Health Rehabilitation Research
Fellowship, Veterans Affairs Palo Alto Health Care System, CA
- 2009 Co-Recipient of the Orthopaedic Research and Education
Foundation grant, Rosemont, IL

2008	Harold and Marcia Wagner Engineering Fellowship Teaching Award, Dept of Mechanical Engineering, Stanford University CA
2005	Stanford Graduate Fellowship in Science and Engineering, Department of Mechanical Engineering, Stanford University CA
2005	The Outstanding Engineering Student Award for the graduating class of 2005, University of Texas at Austin, TX
2004	Honors Internship at Applied Research Laboratories, University of Texas at Austin, TX
2003	Inducted into Tau Beta Pi Engineering Honors Society, University of Texas at Austin, TX
2003	Inducted into Pi Tau Sigma Mechanical Engineering Honors Society, University of Texas at Austin, TX
2001	Society of Automotive Engineering Scholarship, University of Texas at Austin, TX

LIST OF PUBLICATIONS

Refereed Journal Articles

Rylander J: CORR Insights on Subject-specific Patterns of Femur-labrum Contact are Complex and Vary in Asymptomatic Hips and Hips With Femoroacetabular Impingement. Invited Commentary for Clinical Orthopaedics and Related Research, Accepted Sept 2014.

Rylander J, Shu B, Safran M, Andriacchi T: Functional Testing Provides Unique Insights into the Pathomechanics of Femoroacetabular Impingement and an Objective Basis for Evaluating Treatment Outcome. *Journal of Orthopaedic Research*, 2013 31(9): 1461-8.

Rylander J, Shu B, Andriacchi T, Safran M: Preoperative and Postoperative Sagittal Plane Hip Kinematics in Patients with Femoroacetabular Impingement During Level Walking. *American Journal of Sports Medicine*. 2011 39:36S

Koo S, **Rylander J, Andriacchi T:** Knee Joint Kinematics During Walking Influences the Spatial Cartilage Thickness Distribution in the Knee. *Journal of Biomechanics*. 2011 44(7): 1405-9.

Shu B, **Rylander J, Andriacchi T, Safran M:** Femoroacetabular Impingement Patients Exhibit Hip Flexion Angle Abnormalities During Level Walking. *Medicine and Science in Sports and Exercise*. 2010 42:5

Manuscripts in Preparation

Rylander J, Wilken J, Cusumano J, Dingwell J: Coronal Plane Treadmill Stepping Control Strategies in Individuals with Transtibial Amputation during Perturbed and Unperturbed Walking

Rylander J, Boyer K, Andriacchi T, Beaupre G: The use of questionnaires for assessing the mechanical stimuli from daily activities

Rylander J, Shu B, Boyer, K, Safran M, Andriacchi T: Jogging as a Functional Outcome Metric for the Surgical Treatment of Femoroacetabular Impingement

Rylander J, Heitman D, Scanlan S, Keller J, Donahue J, Andriacchi T, Dillingham M: Altered Kinematics and Kinetics in Activities of Daily Living in Individuals Following Surgical Repair of Proximal Hamstring Injury

Conference Abstracts

Rylander J, Wilken J, Cusumano J, Dingwell J. (2014) Strategies for controlling lateral stepping movements in human walking. Accepted for presentation at the 44th Meeting of the Society for Neuroscience, Washington DC.

Rylander J, Wilken J, Cusumano J, Dingwell J. (2014) Able Bodied Persons and Individuals with Transtibial Amputation Employ Similar Control Strategies in the Frontal Plane during Treadmill Walking. Proceedings of the 7th World Congress of Biomechanics, Boston MA.

Rylander J, Beltran E, Wilken J, Dingwell J. (2014) Healthy Persons with Unilateral Amputation and Able Bodied Controls Respond Similarly to Visual Field Perturbations while Walking. Trans of the 60th Meeting of the Orthopaedic Research Society, New Orleans, LA.

Safran M, **Rylander J**, Shu B, Andriacchi T. (2014) Can Bracing Affect Altered Gait Patterns in Femoroacetabular Impingement? Trans of the 2014 American Academy of Orthopaedic Surgeons Annual Meeting, New Orleans, LA.

Rylander J, Wilken J, Cusumano J, Dingwell J. (2013) Coronal Plane Treadmill Stepping Control Strategies in Individuals with Transtibial Amputation. Proceedings of the 43rd Meeting of the Society for Neuroscience, San Diego, CA.

Rylander J, Blazek K, Boyer K, Safran M, Andriacchi T. (2013) Hip Flexion Angle Abnormality Associated with Hip Osteoarthritis Risk. Trans of the 59th Meeting of the Orthopaedic Research Society, San Antonio, TX.

Rylander J, Shu B, Boyer K, Safran M, Andriacchi T. (2012) Jogging as a Functional Outcome Metric for the Surgical Treatment of Femoroacetabular Impingement. Proceedings of the 4th International Society of Hip Arthroscopy Annual Scientific Meeting, Boston, MA.

Rylander J, Shu B, Asay J, Safran M, Andriacchi T. (2012) Hip Kinematics Pre- and Post- Operatively in Subjects with Femoroacetabular Impingement During Stair Climbing. Trans. of the 58th Meeting of the Orthopaedic Research Society, San Francisco, CA.

Rylander J, Heitman D, Scanlan S, Dillingham M, Andriacchi T. (2012) Objective and Subjective Outcome Measures for the Surgical Treatment of Proximal Hamstring Avulsion Injuries. Trans. of the 58th Meeting of the Orthopaedic Research Society, San Francisco, CA.

Rylander J, Shu B, Asay J, Safran M, Andriacchi T. (2011) Altered Stair Climbing Mechanics in Subjects with Femoroacetabular Impingement. Proceeding of the 35th American Society of Biomechanics Conference, Long Beach, CA.

Rylander J, Shu B, Safran M, Andriacchi T. (2011) Hip Kinematics Pre- and Post- Operatively in Subjects with Femoroacetabular Impingement During Level Walking. Trans. of the 57th Meeting of the Orthopaedic Research Society, Long Beach, CA.

Rylander J, Shu B, Safran M, Andriacchi T. (2011) Hip Sagittal Plane Kinematics in Subjects with Femoroacetabular Impingement Pre- and Post-Operatively. Proceedings of the 2nd Bio Mechanical Engineering Conference, Stanford, CA.

Shu B, **Rylander J**, Andriacchi T, Safran M. (2010) Reshaping the Hip, Reshaping the Walk: Gait Abnormalities in FAI and the Effect of Surgery." Proceedings of the 2nd International Society of Hip Arthroscopy Annual Scientific Meeting, Cancun, Mexico. *Winner: ISHA Trainee Prize 2010.*

Rylander J, Shu B, Safran M, Andriacchi T. (2010) Hip Flexion Angle Abnormalities in Subjects with Femoroacetabular Impingement During Level Walking. Trans.of the 56th Meeting of the Orthopaedic Research.Society, New Orleans, LA.

Rylander J, Shu B, Safran M, Andriacchi T. (2010) The Effects of Femoroacetabular Impingement on Hip Kinematics During Level Walking. Proceedings of the 1st Bio Mechanical Engineering Conference, Stanford, CA.

Shu B, **Rylander J**, Andriacchi T, Safran M. (2010) Femoroacetabular Impingement Patients Exhibit Hip Flexion Angle Abnormalities During Level Walking. Proceeding of the 57th Meeting of the American College of Sports Medicine, Baltimore, MD.

Rylander J, Boyer K, Andriacchi T, Beaupre G. (2009) Assessing the Appropriate Number of Days Needed to Approximate Physical Activity Level in Active Elderly. Proceedings of the ASME 2009 Summer Bioengineering Conference June 17-21, Resort at Squaw Creek, Lake Tahoe, CA, USA

Boyer K, **Rylander J**, Andriacchi T, Beaupre G. (2009) Inter-subject variability in ground reaction force – walking speed relationship is related to different motion of center of mass. Proceedings of the ASME 2009 Summer Bioengineering Conference June 17-21, Resort at Squaw Creek, Lake Tahoe, CA, USA

Boyer K, **Rylander J**, Andriacchi T, Beaupre G. (2009) Gender and age specific relationships exist between walking and bone density. Proceedings of the XXII Congress of the International Society of Biomechanics. July 5- 9th, Cape Town, South Africa

Rylander J, Boyer K, Andriacchi T, Beaupre G. (2008) The Challenge of Monitoring Activity Level in the Elderly. Proceeding of the 32nd American Society of Biomechanics Conference in joint with North American Congress of Biomechanics, Ann Arbor, MI.

Boyer K, **Rylander J.**, Kiratli B, Andriacchi T, Beaupre G. (2008) Physical Activity for maintaining healthy bone density with aging. Proceeding of the 32nd American Society of Biomechanics Conference in joint with North American Congress of Biomechanics, Ann Arbor, MI.

Briant P, **Rylander J**, Bevil S, Andriacchi T. (2007) Effects of Altered Loading on Collagen Matrix Deformation in Articular Cartilage. Trans. of the 53rd Meeting of the Orthopaedic Research Society, San Diego, CA.

Koo S, **Rylander J**, Andriacchi T. (2007) The Anterior-Posterior Thickness Variation of Femoral Cartilage in the TibioFemoral Joint is Influenced by the Knee Flexion Angles During Walking.

Proceeding of the 31st American Society of Biomechanics Conference, Palo Alto, CA: *Finalist for the Clinical Biomechanics Award.*

Invited Presentations

Rylander J, Shu B, Safran M, Andriacchi T (2012) Functional Testing Provides Unique Insights into the Pathomechanics of Femoroacetabular Impingement and an Objective Basis for Evaluating Treatment Outcome, Invited Podium presentation, 58th Meeting of the Orthopaedic Research Society, San Francisco, CA.

ADDITIONAL EXPERIENCE

Manuscript Reviewer

Journal of Orthopaedics, Clinical BioMechanics, Journal of Biomechanics, Public Library of Science (PLOS) One. Journal of Engineering in Medicine

ACTIVE PROFESSIONAL MEMBERSHIPS

2013-Present	Member of the Society for Neuroscience
2011-Present	Member of Orthopaedic Research Society
2008-Present	Member of American Society of Biomechanics