

CURRICULUM VITAE  
**Michael D. Harris, PhD**

**CONTACT INFORMATION:**

Program in Physical Therapy  
Washington University School of Medicine  
Campus Box 8502  
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St. Louis, Missouri 63108  
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**PRESENT POSITION:**

Assistant Professor of Physical Therapy  
Assistant Professor of Orthopaedic Surgery  
Washington University in St Louis School of Medicine

Assistant Professor of Mechanical Engineering and Materials Science  
Washington University in St Louis

**EDUCATION:**

2007                    **Bachelor of Science in Biomedical Engineering**  
University of Utah    Salt Lake City, UT

2013                    **PhD in Bioengineering**  
University of Utah    Salt Lake City, UT  
Dissertation Title: The Geometry and Mechanics of Normal and  
Pathomorphologic Human Hips

**ACADEMIC POSITIONS / EMPLOYMENT:**

10/2005 – 08/2008    **Research Assistant**  
Musculoskeletal Research Laboratories  
University of Utah, Salt Lake City, Utah  
Supervisor: Dr. Jeffrey Weiss, PhD

07/2007 – 02/2008    **Research & Development Intern**  
Otto Bock Healthcare  
Salt Lake City, UT  
Supervisor: Sarah McCarvill

08/2008 – 04/2013    **Graduate Research Assistant**

Orthopaedic Research Laboratory  
University of Utah, Salt Lake City, Utah  
Advisor: Dr. Andrew Anderson, PhD  
Secondary Advisor: Dr. Jeffrey Weiss, PhD

- 04/2013 – 10/2015    **Postdoctoral Research Fellow**  
Center for Orthopaedic Biomechanics  
University of Denver, Denver, Colorado  
Mentors: Kevin Shelburne, PhD, Paul Rullkoetter PhD, and Bradley Davidson, PhD
- 12/2015 – 6/2016    **Instructor, Program in Physical Therapy**  
**Instructor, Department of Orthopaedic Surgery**  
Washington University School of Medicine, St Louis, Missouri
- 7/2016 – present    **Assistant Professor, Program in Physical Therapy**  
**Assistant Professor, Department of Orthopaedic Surgery**  
**Assistant Professor, Department of Mechanical Engineering and Materials Science**  
Washington University School of Medicine, St Louis, Missouri

**HONORS and AWARDS:**

- 2006-2007    Biomedical Engineering Society Student Chapter Officer, University of Utah  
2006 – present    Tau Beta Pi National Engineering Honor Society  
2007    University of Utah Undergraduate Research Scholar  
2007    1<sup>st</sup> Place Bioengineering Undergraduate Poster and Presentation Research Symposium  
2008    Campbell Endowed Graduate Fellowship recipient from the University of Utah College of Engineering  
2009, 2010    University of Utah Graduate Student Travel Award  
2010, 2011, 2012    Obyn Memorial Endowed Scholar in the Department of Orthopaedics  
2011    David R. and Isabelle E. Atherton Scholarship in the School of Medicine recipient  
2012    Featured cover article for the July 2012 issue of the *Journal of Orthopaedic Research*  
2012    LSPeery Discovery Program in Musculoskeletal Restoration Scholar  
2012    University of Utah Orthopaedic Center Bone Award  
2016    Washington University Musculoskeletal Research Center Winter Symposium Travel Award – Best Poster

**EDITORIAL / SERVICE RESPONSIBILITIES:**

- Judge    World Congress of Biomechanics Student Paper Competition (2014)  
Reviewer    *Journal of Biomechanical Engineering*  
Reviewer    *Annals of Biomedical Engineering*  
Reviewer    *Journal of Orthopaedic Research*  
Reviewer    *Journal of Applied Biomechanics*  
Reviewer    *Computer Methods in Biomechanics and Biomedical Engineering*

Reviewer	<i>The Anatomical Record</i>
Reviewer	<i>Journal of Biomechanics</i>
Scientist Reviewer	Congressionally Directed Medical Research Programs, Peer Reviewed Medical Research Program (2016, 2017)
Reviewer	Orthopaedic Research Society Annual Meeting abstracts (2017,2018)
Reviewer	Orthopaedic Research and Education Foundation research grants (2017)
Reviewer	<i>Geriatric Orthopaedic Surgery and Rehabilitation</i>
Reviewer	<i>PLOS ONE</i>
Reviewer	<i>Journal of Engineering in Medicine</i>
Member	Research Advisory Council – Washington University Program in Physical Therapy

### **PROFESSIONAL SOCIETIES and ORGANIZATIONS:**

2006 – present	Tau Beta Pi, Engineering Honor Society
2015 – 2017	American College of Sports Medicine
2015 – 2017	Gait and Clinical Movement Analysis Society
2015 – present	Washington University Institute of Clinical and Translation Sciences
2016 – present	Orthopaedic Research Society
2016 – present	American Society of Biomechanics
2017 – present	Washington University Musculoskeletal Research Center

### **RESEARCH SUPPORT:**

#### Ongoing

Washington University Musculoskeletal Research Center 2018 Pilot & Feasibility Award (\$40,000) 4/1/2018 – 3/31/2019

Awarded through NIH/NIAMS P30AR057235 (PI = Silva)

*Muscle Performance after Periacetabular Osteotomy*

**Role = PI**

K01AR072072 NIH/NIAMS (\$554,225) 4/1/2018 – 3/30/2023

*Muscle Geometry and its Influence on Function in Patients with Developmental Dysplasia of the Hip*

**Role = PI**

#### Pending

#### Completed

5R01HL077683-08 NIH/NHLBI (\$1,600,000) 1/1/2004 – 06/30/2008

PI = Jeff Weiss

*Angiogenesis and the Extracellular Matrix*

**Role: Undergraduate Research Assistant (execution)**

1R01AR053344 NIH/NIAMS (\$1,800,000) 7/1/2007 – 6/30/2013

PI = Jeff Weiss (co-I= Andrew Anderson, co-I= Chris Peters)

*Biomechanics of the Dysplastic Hip*

**Role: Research Assistant (methodology, execution)**

Interdisciplinary Research Seed Grant (\$11,000) 1/1/2010 – 12/31/2011

PI = Chris Peters (co-I = Ross Whitaker)

*Statistical Shape Modeling of Femoroacetabular Impingement*

**Role: Graduate Research Assistant (methodology, execution)**

S10-RR026565 (\$222,000) 4/1/2010 – 5/21/2012

PI = Andrew Anderson (co-Is = Ingrid Nygaard, Chris Peters, Jeff Weiss, Kent Bachus, Jeff Weiss, Dick Norman, Bruce MacWilliams, Stacey Bamberg, Jim Martin, David Carrier, Paul LaStayo, Roy Bloebaum, Ken Foreman, Lee Dibble, Greg Clark)

*Tandem Instrumented Treadmill for Accurate Assessment of in-vivo Joint Kinetics*

**Role: Graduate Research Assistant (writing, submission, execution)**

1I01RX000262-01A1 (\$750,000) 10/1/2010 – 9/30/2013

VA: RR&D Merit Review Award (Parent I01)

PI=Kent Bachus (co-Is= Robert Tashjian, Roy Bloebaum, Gregory Stoddard)

*Predicting Skeletal Stability of Endoprostheses for Above Elbow Amputee*

**Role: Graduate Research Assistant (writing, methodology, execution)**

National Center for Simulation in Rehab. Research (\$15,000) 6/27/2011 – 9/1/2011

Visiting Scholar and Professor – Stanford University

PI = Andrew Anderson

*Coupling Patient-Specific Finite Element Analysis with Musculoskeletal Modeling to study Acetabular Dysplasia and Femoroacetabular Impingement*

**Role: Graduate Research Assistant (writing, methodology, execution)**

University of Utah Seed Grant (\$28,000) 7/1/2011 – 12/31/2012

PIs= Heath Henninger, Robert Tashjian

*In Vivo Determination of Scapula Kinematics after Reverse Total Shoulder Arthroplasty*

**Role: Graduate Research Assistant (methodology, execution)**

R21-AR3466184 (\$411,125) 12/1/2012 – 11/30/2014

PI = Andrew Anderson (co-I= Chris Peters, Bo Foreman)

*Musculoskeletal and Finite Element Modeling of Femoroacetabular Impingement*

**Role: Research Associate (writing, submission, methodology)**

Knoebel Center for the Study of Aging Pilot Grant (\$64,000) 5/1/2014-6/1/2015

PI = Bradley Davidson (Co-PI Kevin Shelburne)

*Improving rehabilitation after Lower-extremity Joint replacement Surgery by considering regional Interdependence in the Musculoskeletal System*

**Role: Postdoctoral Researcher (conceptualization, writing, execution)**

R01EB015497 NIH/NIBIB (\$1,150,000) 8/1/2012 – 8/1/2016  
PI = Kevin Shelburne  
*Multi-scale Finite Element Musculoskeletal Modeling Framework Applied to Current Issues in Joint Replacement*  
**Role: Postdoctoral Researcher (execution)**

R01-EB016701 (\$1,699,034) 4/1/2013 – 3/31/2017  
PI = Andrew Anderson (co-I= Jeff Weiss, Chris Peters, Ross Whitaker)  
*Population-Based Shape and Biomechanical Analysis of Hip Pathoanatomy*  
**Role: Research Associate (writing, submission, methodology)**

DePuy Synthes (\$758,708) 3/2015 – 3/2017  
PI = Paul Rullkoetter  
*A Proposal for Research Partnership in Total Hip Replacement*  
**Role: Postdoctoral Researcher (methodology, execution)**

7/2016 – 5/2017  
Washington University Program in Physical Therapy Pilot Funding Award (\$2000)  
*Carbon Fiber Off-loading Ankle Foot Orthosis Design Optimization*  
**Role = PI**

R41DK109731-01 NIH/NIDDK (\$186,737) 5/24/2016 – 5/23/2018  
PI = Michael Dailey, Dequan Zou  
*Carbon Fiber Off-Loading Orthosis*  
**Role = Co-Investigator (methodology, execution)**

#### **TEACHING TITLE AND RESPONSIBILITIES:**

Guest Lecturer MEMS 5564 Orthopaedic Biomechanics – Cartilage/Tendon (2016, 2018)  
Washington University, Department of Mechanical Engineering and Material Science

Guest Lecturer BME 4200 Biomechanics (2016)  
St Louis University, Department of Biomedical Engineering

Instructor IPMS 5510 Movement Science II – Biomechanics (2017)  
Washington University School of Medicine, Program in Physical Therapy

Guest Instructor IPMS Case Integration III (2017, 2018)  
Biomechanics research tools and application for physical therapists  
Washington University School of Medicine, Program in Physical Therapy

#### **TRAINEE ADVISEMENT:**

PhD Primary Advisor Ke Song, MS – PhD candidate, Mechanical Engineering

	Washington University in St Louis 2016 - present
Research Advisor	Hannah Steele, BS – DPT student & Research Assistant Washington University in St Louis 2016
Independent Study Mentor Work-study Supervisor	Carly Krull – BS student (class 2018), Biomedical Engineering Washington University in St Louis 2017-2018; currently Research Assistant at Ohio State University Spine Research Institute
Research Advisor	Lauren Westen, BS – DPT student & Research Assistant Washington University in St Louis 2017 – present
Committee Member	Clarissa Levasseur, BS – MS student, Biomedical Engineering St Louis University 2016 – 2017; currently Research Engineer at University of Pittsburgh Biodynamics Laboratory
Committee Member	Elie Harrison – PhD candidate, Movement Science Washington University in St Louis 2017 – present
Committee Member	Christian Weber – PhD candidate, Biomedical Engineering Washington University in St Louis 2017 – present
Postdoctoral Mentor	Brecca Gaffney, PhD – Postdoctoral Scholar, Program in Physical Therapy 2018-2019 L’Oreal USA Women for Science Fellow Washington University in St Louis 2017 – present
Independent Study Mentor	Divya Joshi – BS student (class 2018), Biomedical Engineering Washington University in St Louis 2017
Independent Study Mentor Supervisor	Jacqueline Foody – BS student (class 2019), Biomedical Engineering Washington University in St Louis Independent Study (2018) Research Assistant 2018 - present
Independent Study Mentor	Maria Wanner – BS student (class 2019), Biomedical Engineering Washington University in St Louis 2018

Supervisor	Julia Blumkaitis, BA – Research Assistant Washington University in St Louis 2018 – present
Independent Study Mentor Work Study Supervisor	Molly Shepherd – BS student (class 2019), Washington University in St Louis Independent Study (2018) Research Assistant 2018 – present
Committee Member	Quenten Hooker – TL1 Predoctoral Clinical Research Program, Washington University in St Louis 2018 – present
Committee Member	Alex Reiter – PhD candidate, Mechanical Engineering and Materials Science Washington University in St Louis 2018 – present

## **BIBLIOGRAPHY:**

### **Peer-reviewed Journal Articles**

1. Henak CR, Ellis BJ, **Harris MD**, Anderson AE, Peters CL, Weiss JA: Role of the acetabular labrum in load support across the hip joint. *Journal of Biomechanics*. Aug 2011, 44(12):2201-6.
2. Hansen BJ, **Harris MD**, Anderson LA, Weiss JA, Peters CL, Anderson AE: Correlation between radiologic measures of acetabular morphology with 3D femoral head coverage in patients with acetabular retroversion. *Acta Orthopaedica*. Jun 2012, 83(3): 233-9.
3. **Harris MD**, Anderson AE, Henak CR, Ellis BJ, Peters CL, Weiss JA: Finite element prediction of cartilage contact stresses in normal human hips. *Journal of Orthopaedic Research*. Jul 2012, 30(7):1133-39. (cover article)
4. Barg A, **Harris MD**, Henninger HB, Amendola RL, Saltzman CL, Hintermann B, Anderson AE: Medial distal tibial angle: comparison between weight-bearing mortise view and hindfoot alignment view. *Foot and Ankle International*. Aug 2012, 33(8):655-61.
5. **Harris MD**, Reese SP, Weiss JA, Peters CL, Anderson AE: Three-dimensional quantification of femoral head shape in controls and patients with cam-type femoroacetabular impingement. *Annals of Biomedical Engineering* Jun 2013, 41(6): 1162-1171.
6. Henak CR, Carruth EC, Anderson AE, **Harris MD**, Ellis BJ, Peters CL, Weiss JA: Finite element predictions of cartilage contact mechanics in hips with retroverted acetabula. *Osteoarthritis and Cartilage*. Oct 2013, 21(10): 1522-1529.

7. **Harris MD**, Datar M, Jurrus ER, Whitaker RT, Peters CL, Anderson AE: Statistical shape modeling of cam femoroacetabular impingement. *Journal of Orthopaedic Research* Oct 2013, 31(10): 1620-1626.
8. **Harris MD**, Kapron AL, Peters CL, Anderson AE: Correlations between the alpha angle and femoral head asphericity: Implications and recommendations for the diagnosis of cam femoroacetabular impingement. *European Journal of Radiology* May 2014, 83(5): 788-796.
9. Ivester J, Cyr AJ, **Harris MD**, Kulis M, Rullkoetter P, Shelburne KB: A reconfigurable high-speed stereo-radiography system for sub-millimeter measure of in-vivo joint kinematics. *ASME Journal of Medical Devices* 2015, 9(4):041009-041009-7.
10. Gaffney BM, **Harris MD**, Davidson BS, Stevens-Lapsley JE, Christiansen CL, Shelburne KB: Multi-joint compensatory effects of unilateral total knee arthroplasty during high-demand tasks. *Annals of Biomedical Engineering* Aug 2016, 44(8):2529-41.
11. **Harris MD**, Cyr AJ, Azhar AA, Fitzpatrick CK, Rullkoetter PJ, Maletsky LP, Shelburne KB: A combined experimental and computational approach to subject-specific analysis of knee joint laxity. *Journal of Biomechanical Engineering* Aug 2016, 138(8).
12. Atkins PR, Elhabian SY, Agrawal P, **Harris MD**, Whitaker RT, Weiss JA, Peters CL, Anderson AE: Quantitative comparison of cortical bone thickness using statistical shape modeling in patients with cam femoroacetabular impingement. *Journal of Orthopaedic Research* Aug 2017, 35(8):1743-1753.
13. **Harris MD**, MacWilliams BA, Foreman KB, Peters CL, Weiss JA, Anderson AE: Higher medially directed joint reaction forces are a characteristic of dysplastic hips: a comparative study using subject-specific musculoskeletal models. *Journal of Biomechanics* Mar 2017, 54:80-87. (highlighted article)
14. Pascual-Garrido C, **Harris MD**, Clohisy JC: Innovations in joint preservation procedures for the dysplastic hip “the periacetabular osteotomy.” *Journal of Arthroplasty* Sep 2017, 32(9S): S32-S37.
15. Ali AA, **Harris MD**, Shalhoub S, Maltesky LP, Rullkoetter PJ, Shelburne KB: Combined measurement and modeling of specimen-specific knee mechanics for healthy and ACL-deficient conditions. *Journal of Biomechanics* May 2017, 54:117-24. (highlighted article)
16. Kefala V, Cyr AJ, **Harris MD**, Hume DR, Davidson BS, Shelburne KB: Assessment of knee kinematics in older adults using high-speed stereo radiography. *Medicine and Science in Sports and Engineering* Nov 2017, 49(11):2260-2267.
17. Pascual-Garrido C, Guilak F, Rai MF, **Harris MD**, Lopez MJ, Todhunter RJ, Clohisy JC: Canine hip dysplasia: a natural animal model for human developmental dysplasia of the hip. *Journal of Orthopaedic Research* Jul 2018, 36(7): 1807-1817.



18. Hume DR, Kefala V, **Harris MD**, Shelburne KB: Comparison of marker-based and stereo radiography knee kinematics in activities of daily living. *Annals of Biomedical Engineering* Nov 2018, 46(11):1806-1815.
19. Song K, Anderson AE, Weiss JA, **Harris MD**: Musculoskeletal models with generic and subject-specific geometry estimate different joint biomechanics in dysplastic hips. *Computer Methods in Biomechanics and Biomedical Engineering* 2018, doi 10.1080/10255842.2018.1550577.
20. Gaffney BMM, Hillen TJ, Nepple JJ, Clohisy JC, **Harris MD**: Statistical shape modeling of femur shape variability in female patients with hip dysplasia. *Journal of Orthopaedic Research* 2018, doi 10.1002/jor.24214.

### Conference Abstracts and Papers

1. Birchler BA, Guilkey JE, **Harris MD**, Krishnan LK, Weiss JA: Extracting the material properties of multicellular structures using large scale computational simulations: validation with a surrogate. 2<sup>nd</sup> Annual Mountain West Biomedical Engineering Conference, Park City, UT, Sept 2006. (Poster)
2. **Harris MD**: Mechanical characterization of surrogate loaded gels for use in angiogenesis computer model validation. *Univ. of Utah Undergrad. Res. Abstracts*. May 2007.
3. **Harris MD**, Weiss JA: Mechanical characterization of surrogate loaded gels for use in angiogenesis computer model validation. Bioengineering Undergraduate Research Symposium, Salt Lake City, UT, April 2007. (Poster)
4. **Harris MD**, Anderson AE, Ellis BJ, Maas SA, Joshi S, Glaunes J, Peters CL, Weiss JA: Finite element prediction of cartilage contact pressures in normal human hips. 55<sup>th</sup> Annual Meeting of the Orthopaedic Research Society. Las Vegas, NV, February 2009. (Poster # 2197)
5. **Harris MD**, Anderson AE, Ellis BJ, Maas SA, Joshi SC, Glaunes J, Peters CL, Weiss JA: Finite element predictions of cartilage mechanics in human hips. Proceedings of the ASME 2009 Summer Bioengineering Conference, Lake Tahoe, CA, June 2009. (Mow Symposium Podium Presentation; Paper Number: SBC2009-206487).
6. Alexander A, **Harris MD**, Anderson AE, Weiss JA, Prastawa M, Joshi S: Estimation of regional biomechanical properties within a population using a representative surface average. 5<sup>th</sup> Annual Mountain West Biomedical Engineering Conference, Park City, UT, September 2009. (Poster #1).
7. Adams CR, Ellis BJ, **Harris MD**, Anderson AE, Peters CL, Weiss JA: Effect of the acetabular labrum on cartilage contact stresses and load distribution in the hip. 56<sup>th</sup> Annual Meeting of the Orthopaedic Research Society, New Orleans, LA, March 2010.

8. **Harris MD**, Hansen BJ, Anderson L, Reese SP, Peters CL, Weiss JA, Anderson AE: Regional 3D measures of acetabular coverage in retroverted dysplastic hips. 56<sup>th</sup> Annual Meeting of the Orthopaedic Research Society, New Orleans, LA, March 2010. (Poster # 1361).
9. **Harris MD**, Davis RS, MacWilliams BA, Peters CL, Anderson AE: Musculoskeletal modeling of acetabular dysplasia – kinematics, muscle, and joint reaction forces. Proceedings of the ASME 2010 Summer Bioengineering Conference, Naples, FL, June 2010. (Paper Number: SBC2010-19658).
10. **Harris MD**, Davis RS, MacWilliams BA, Peters CL, Weiss JA, Anderson AE: Differences in joint angles, muscle forces, and joint contact forces between normal and dysplastic hips. 57<sup>th</sup> Annual Meeting of the Orthopaedic Research Society, Long Beach, CA, January 2011. (Poster # 1360).
11. Barg A, Anderson AE, **Harris MD**, Henninger HB, Nickisch F, Hintermann B, Saltzman CL. Radiographic measurement of medial distal tibial angle, part I: Comparison between weight-bearing mortise and special hindfoot alignment view radiographs. 27<sup>th</sup> Annual Summer Meeting, American Orthopaedic Foot & Ankle Society (AOFAS), Keystone, Colorado, July 13-16, 2011.
12. Barg A, **Harris MD**, Henninger HB, Hintermann B, Anderson AE. Radiographic measurement of medial distal tibial angle, part II: Influence of ankle position (rotation, dorsiflexion/plantar flexion) and radiograph technique on obtained results. 27<sup>th</sup> Annual Summer Meeting, American Orthopaedic Foot & Ankle Society (AOFAS), Keystone, Colorado, July 13-16, 2011.
13. Drew AJ, **Harris MD**, Gross SJ, Bachus, KJ: Virtual implantation for implant design optimization and surgical planning. 2011 Utah Biomedical Engineering Conference, Salt Lake City, UT, September 2011.
14. **Harris MD**, Reese SP, Weiss JA, Peters CL, Anderson AE: 3D morphological assessment of cam femoroacetabular impingement. 2011 Utah Biomedical Engineering Conference, Salt Lake City, UT, September 2011.
15. **Harris MD**, Datar M, Jurrus E, Peters CL, Whitaker RT, Anderson AE: Statistical shape modeling of cam-type femoroacetabular impingement. 2012 Computational Methods in Biomechanics and Biomedical Engineering (10<sup>th</sup> International Symposium) , Berlin, Germany, April 2012.
16. Henninger HB, **Harris MD**, Petersen K, Burks R, Tashjian R: Comparison of methods to predict scapular notching from radiographs after reverse total shoulder arthroplasty. ASME Summer Bioengineering Conference, Fajardo, Puerto Rico, June 2012.
17. **Harris MD**, Kapron AL, Peters CL, Anderson AE: Correlations between 2D radiographic and 3D model-based measurements of femoral asphericity. 2013 Annual Meeting of the Orthopaedic Research Society, San Antonio, TX, January 2013. (Podium Presentation, Paper # 50).
18. **Harris MD**, Datar M, Jurrus ER, Whitaker RT, Peters CL, Anderson AE: Statistical shape modeling of cam femoroacetabular impingement. 2013 Annual Meeting of the Orthopaedic Research Society, San Antonio, TX, January 2013. (Poster #1744).

19. Henak CR, Carruth E, **Harris MD**, Ellis BJ, Anderson AE, Peters CL, Weiss JA: Cartilage contact mechanics in hips with retroverted acetabula. 2013 Annual Meeting of the Orthopaedic Research Society, San Antonio, TX, January 2013. (Poster #986).
20. Gilliland J, **Harris MD**, Anderson L, Hanrahan CJ, Anderson AE, Peters CL, West H: Association of pelvic incidence with pincer type femoroacetabular impingement. 2013 Meeting of the Skeletal Society of Radiology. March 2013.
21. **Harris MD**, Peters CL, Erickson J, Henak CR, Kapron AL, Abraham CL, Weiss JA, Anderson AE: Pathomechanics of FAI and hip dysplasia: current clinical and translational science perspectives. 2013 Annual Meeting of the American Academy of Orthopaedic Surgeons, Chicago, IL, March 2013. (Scientific Exhibit #11)
22. Henak CR, Carruth ED, Anderson AE, **Harris MD**, Ellis BJ, LPeters C, Weiss JA: Finite element predictions of cartilage contact mechanics in hips with retroverted acetabula. ASME Summer Bioengineering Conference, Sunriver, OR, June 2013.
23. Peters CL, Weiss JA, **Harris MD**, Henak CR, Kapron AL, Anderson AE: Patient-specific computational modeling to facilitate our understanding of hip pathomorphology. 11<sup>th</sup> International Symposium of the Computer Methods in Biomechanics and Biomedical Engineering. Salt Lake City, UT, April 2013. (Invited speaker)
24. Decker M, **Harris MD**, Meyers C, Shelburne KS, Davidson BS: The effects of sex and knee support level on quasi-stiffness of the knee and dynamic stability during landing. 60<sup>th</sup> Annual Meeting of the Orthopaedic Research Society. New Orleans, LA, March 2014. (Poster # 1690)
25. Gaffney BG, Davidson BS, **Harris MD**, Stevens-Lapsley JE, Christiansen CL, Shelburne KS: Limb asymmetry during high-level functional tasks after unilateral total knee arthroplasty. 60<sup>th</sup> Annual Meeting of the Orthopaedic Research Society. New Orleans, LA, March 2014.
26. **Harris MD**, MacWilliams BA, Foreman B, Peters CL, Weiss JA, Anderson AE: Hip joint mechanics in young adults with acetabular dysplasia: joint angles, moments, muscle forces, and reaction forces during walking. 7<sup>th</sup> World Congress of Biomechanics, Boston, MA, July 2014. (poster 874).
27. Cyr AJ, **Harris MD**, Kefala V, Gordon MH, Rullkoetter PJ, Davidson BS, Shelburne KS: Implant tracking using a high-speed stereo radiography system. 7<sup>th</sup> World Congress of Biomechanics, Boston, MA, July 2014.
28. Gaffney BG, Davidson BS, **Harris MD**, Stevens-Lapsley JE, Christiansen CL, Shelburne KB: Quadriceps force and movement strategies during high-demand activities after unilateral total knee arthroplasty. 7<sup>th</sup> World Congress of Biomechanics, Boston, MA, July 2014.
29. Weiss JA, Anderson AE, Peters CL, Henak CR, **Harris MD**, Abraham CL, Kapron AL, Ellis BJ, Maas SA: Patient-specific analysis of hip chondrolabral mechanics: studies of hip pathomorphology. 7<sup>th</sup> World Congress of Biomechanics, Boston, MA, July 2014.

30. Anderson AE, Kapron AL, **Harris MD**, Weiss JA, Henak CR, Peters CL, Aoki SK, Abraham CL, Maas SA, Ellis BJ: Patient-specific motion capture and biomechanical modeling of acetabular dysplasia and femoroacetabular impingement. 7<sup>th</sup> World Congress of Biomechanics, Boston, MA, July 2014.
31. Atkins P, Mukherjee P, Singla S, Elhabian S, **Harris MD**, Weiss JA, Whitaker RT, Anderson AE: Statistical shape modeling of cortical bone thickness in patients with femoroacetabular impingement. BMES 2014 Annual Meeting, San Antonio, TX, October 2014 (presentation #827).
32. Gaffney BM, **Harris MD**, Davidson BS, Stevens-Lapsley JE, Christiansen CL: Multi-joint effects of total knee arthroplasty during high-demand tasks. Gait & Clinical Movement Analysis Society 2015 Annual Conference, Portland, OR, March 2015 (presentation #83008).
33. Atkins PR, Mukherjee P, Elhabian SY, Singla S, **Harris MD**, Weiss JA, Whitaker RT, Anderson AE: Comparison of proximal femoral cortical bone thickness between patients with femoroacetabular impingement and normal hips analyzed by statistical shape modeling. Orthopaedic Research Society 2015 Annual Meeting, Las Vegas, NV, March 2015 (paper #0015).
34. **Harris MD**, Cyr AJ, Azhar A, Fitzpatrick CK, Rullkoetter PJ, Shelburne KB: A combined experimental and computational approach to subject-specific analysis of human knee joint laxity. Orthopaedic Research Society 2015 Annual Meeting, Las Vegas, NV, March 2015 (presentation # 0234).
35. **Harris MD**, Houston T, Decker MJ, Davidson BS, Shelburne KB: Influence of ACL brace and orthopaedic tights on hip and knee mechanics during cutting maneuvers. American College of Sports Medicine 62<sup>nd</sup> Annual Meeting, San Diego, CA, May 26-30, 2015 (paper #4920).
36. **Harris MD**, Azhar A, Navacchia A, Cyr AJ, Hume D, Fitzpatrick CK, Rullkoetter PJ, Shelburne KB: A multi-scale finite element framework for modeling natural knee mechanics. 2015 Summer Biomechanics, Bioengineering, and Biotransport Conference, Snowbird, UT, June 17-20, 2015 (presentation #314).
37. Hume DR, **Harris MD**, Navacchia A, Shelburne KB: Developing the strength response of a multi-scale musculoskeletal model of the healthy human knee. Orthopaedic Research Society 2016 Annual Meeting, Orlando, FL, Mar 5-8 (paper #240).
38. Ali AA, **Harris MD**, Shalhoub S, Maletsky LP, Shelburne KB: Dynamic evaluation of specimen-specific natural knee mechanics in intact and ACL-deficient gait. Orthopaedic Research Society 2016 Annual Meeting, Orlando, FL, March 5-8 (poster #935).
39. **Harris MD**, MacWilliams BA, Foreman, KB, Peters CL, Weiss JA, Anderson AE: Musculoskeletal modeling of multi-joint mechanics in young adults with acetabular dysplasia. Washington University in St Louis Musculoskeletal Research Center 2016 Winter Symposium, St Louis, MO, February 24, 2016. (Poster #39 – Travel Award Winner)
40. **Harris MD**, Song K, Davidson BS, Decker MJ, Shelburne KB: The influence of a functional knee brace and orthopaedic tights on lower extremity mechanics during land and cut maneuvers.

Orthopaedic Research Society 2017 Annual Meeting, San Diego, CA, March 18-22 (poster #1889).

41. **Harris MD**, Song K, Davidson BS, Decker MJ, Shelburne KB: Multi-joint compensatory maneuvers during landing and cutting at least one year after return to sport following ACL reconstruction. Orthopaedic Research Society 2017 Annual Meeting, San Diego, CA, March 18-22 (poster #0942).
42. Song K, Anderson AE, Weiss JA, **Harris MD**: Musculoskeletal models scaled with CT images versus skin markers in a population with hip deformity compared to controls. 2017 Annual Meeting of the American Society of Biomechanics, Boulder, CO, Aug 8-11 (paper #294).
43. Foster SN, **Harris MD**, Hastings MK, Mueller MJ, Wiseman T, Huber N, Harris-Hayes MJ. Ankle Dorsiflexion and 2D hip, pelvic, and trunk kinematics in patients with chronic hip joint pain during forward step-down. Submitted: APTA Combined Sections Meeting. New Orleans, LA 2018 (ID 2768586).
44. Gaffney BMM, Nepple JJ, Clohisy JC, Westen L, **Harris MD**: Statistical shape modeling to quantify variation in femoral geometry in patients with hip dysplasia. Orthopaedic Research Society 2018 Annual Meeting, New Orleans, LA, March 10-13. (presentation 0086 – Spotlight Session: Hip Disorders).
45. **Harris MD**, Song K, Gaffney BMMG: How femoral version changes joint loading in patients with developmental dysplasia of the hip. 2018 Annual Meeting of the American Society of Biomechanics, Rochester, MN, Aug 8-11 (paper #146).
46. Song K, Gaffney BMMG, Pascual-Garrido C, **Harris MD**: Effects of dysplastic pelvis morphology on hip muscle lines of action, moment arm lengths, and contributions to joint reaction forces. 2018 Annual Meeting of the American Society of Biomechanics, Rochester, MN, Aug 8-11 (paper #154).
47. Gaffney BMMG, **Harris MD**: Sensitivity of hip loading to periacetabular osteotomy reorientation. 2018 Annual Meeting of the American Society of Biomechanics, Rochester, MN, Aug 8-11 (paper #123).
48. Song K, Gaffney BMM, Harris MD: Hip joint reaction force contributions to acetabular edge loading in dysplastic hips: a subject-specific musculoskeletal modeling study. Orthopaedic Research Society 2019 Annual Meeting, Austin, TX, Feb 2-5 (poster #1930).
49. Harris MD, Gaffney BMM, Clohisy JCC, Pascual-Garrido C: Femoral head shape in developmental dysplasia of the hip has fundamental differences compared to femoroacetabular impingement. Orthopaedic Research Society 2019 Annual Meeting, Austin, TX, Feb 2-5 (presentation 310 – Spotlight Session: Pathomechanics of the Hip).
50. Gaffney BMM, Clohisy JCC, Harris MD: Differences in sensitivity of hip loading to periacetabular osteotomy across subgroups of hip dysplasia. Orthopaedic Research Society 2019 Annual Meeting, Austin, TX, Feb 2-5 (poster #1899).

51. Harris MD, Gaffney BMM, Clohisy JCC, Pascual-Garrido C: Femoral head shape in developmental dysplasia of the hip has fundamental differences compared to femoroacetabular impingement. International Combined Orthopaedic Research Societies 2019 Meeting, Montreal, Quebec, Jun 19-22 (podium)

### **Invited Talks**

1. Multi-joint mechanics during gait in young adults with acetabular dysplasia. 2016 Shirley Sahrman Movement System Impairment Retreat, Columbia, IL, February 27-29, 2016.
2. Finding the hip joint center in healthy and pathologic hips. 2017 Shirley Sahrman Movement System Impairment Retreat, Columbia, IL, March 4-6, 2017.
3. The role of muscle in hip dysplasia pathomechanics. 2017 Wyss Hip and Pelvis Structure: A Cross-Pollination Collaborative, Seattle, WA, October 20-21, 2017.
4. Movement science research update - Muscle and hip dysplasia pathomechanics. Washington University Program in Physical Therapy 75<sup>th</sup> Anniversary, St Louis, MO, November 10-11, 2017.
5. Science or Industry? The pros, cons, and considerations for young scientists. Washington University Program in Physical Therapy Movement Science Seminar, St Louis, MO, Feb 13, 2018.
6. Roles, Responsibilities, and Expectations when transitioning from graduate student to postdoc to junior faculty. Washington University Program in Physical Therapy Movement Science Seminar, St Louis, MO, May 8, 2018.
7. Obtaining a NIH Career Development Award. Washington University Program in Physical Therapy Movement Science Seminar, St Louis, MO, Oct 23, 2018.