

DIVISION OF BIOKINESIOLOGY & PHYSICAL THERAPY
UNIVERSITY OF SOUTHERN CALIFORNIA

CURRICULUM VITAE

CHRISTOPHER M. POWERS
2/15/18

I. PERSONAL INFORMATION

University Address

Division of Biokinesiology & Physical Therapy
University of Southern California
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Education

Post-Doctoral Training (1996-1997), University of California Irvine, Irvine, CA
Ph.D. Biokinesiology (1991-1996), University of Southern California, Los Angeles, CA.
M.S. Physical Therapy (1985-1987), Columbia University, New York, NY.
B.A. Physical Education (1980-1984), University of California Santa Barbara, Santa Barbara, CA.

Academic Appointments

1/15-current	<i>Professor</i> Division of Biokinesiology & Physical Therapy Joint appointments: Department of Radiology & Department of Orthopaedic Surgery University of Southern California, Los Angeles, CA.
7/03-12/14	<i>Associate Professor</i> Division of Biokinesiology & Physical Therapy Joint appointments: Department of Radiology & Department of Orthopaedic Surgery University of Southern California, Los Angeles, CA.
7/97-6/03	<i>Assistant Professor</i> Department Biokinesiology & Physical Therapy, University of Southern California, Los Angeles, CA.

Other Previous Employment

- 1/96-6/97 *Post-doctoral Research Fellow*
Orthopaedic Biomechanics Laboratory, Department of Orthopaedic Surgery, University of California Irvine, Irvine, CA
- 5/91-1/96 *Research Physical Therapist*
Pathokinesiology Laboratory, Rancho Los Amigos Medical Center, Downey, CA.
- 6/88-5/91 *Staff Physical Therapist*
Dallmeyer Physical Therapy Center, Santa Barbara, CA.
- 5/87-5/88 *Staff Physical Therapist.*
Suburban Physical Therapy Center, Cedar Grove, NJ.

Honors, Awards & Fellowships

- Commendation for Excellence in Teaching*, Division of Biokinesiology & Physical Therapy, University of Southern California (2014)
- Career Excellence Award in Biomechanics Research*, Section on Research Biomechanics Special Interest group, American Physical Therapy Association (2014)
- Catherine Worthingham Fellow*, American Physical Therapy Association (2011)
- Charles M. Magistro Service Award*, California Chapter, APTA (2009)
- Royce P. Noland Award for Merit*, California Chapter, APTA (2008)
- Distinguished Alumnus Award*, Program in Physical Therapy, Columbia University (2008)
- Standards Excellence Award*, American Society of Testing and Measures (2007)
- Helen J. Hislop Award for Outstanding Contributions to the Professional Literature*, American Physical Therapy Association (2007)
- Lucy Blair Service Award*, American Physical Therapy Association (2006)
- Fellow*, American College of Sports Medicine (2005)
- Best Paper Award*, Society for Gait and Clinical Movement Analysis (2003)
- Innovation in Research Award*, American Society of Safety Engineers Foundation (2002)
- Best Poster Award*, Society for Gait and Clinical Movement Analysis (2002)
- Eugene Michels New Investigator Award*, American Physical Therapy Association (2002)
- Founders Award*, Research Special Interest Group, California Physical Therapy Association (2002)
- Dorothy Briggs Scientific Inquiry Award*, American Physical Therapy Association (2001)
- Best Poster Award*, Society for Gait and Clinical Movement Analysis (2001)
- Physical Therapist Researcher Award*, California Chapter, APTA (2000)
- Rose Excellence in Research Award*, Orthopaedic Section, APTA (1999)
- Physical Therapist Publication Award*, California Chapter, APTA (1996)
- Golden Cane Outstanding Achievement Award*, University of Southern California (1996)
- Promotion of Doctoral Studies Scholarship*, Foundation for Physical Therapy (1993-1995)
- Jacquelin Perry Scholar Award*, University of Southern California (1992)
- Outstanding Student Award*, New York Chapter, APTA/Columbia University (1987)
- Graduation with Honors*, University of California, Santa Barbara (1984)

Professional Memberships

- American Physical Therapy Association (1985-present)
- American College of Sports Medicine (1988-present)
- American Society of Biomechanics (2001-present)
- American Society of Testing and Measures (1999-present)
- Gait and Clinical Movement Analysis Society (1996-present)
- International Patellofemoral Study Group (2003-present)
- International Society for Biomechanics (2009-present)

Licenses & Certifications

Registered Physical Therapist, CA License. #15015.

Certified Kinesiologic Electromyographer, CA License. #20.

II. SCHOLARLY ACTIVITY

Current Grant Support

1/1/17-12/31/18: American Society for Testing & Measures. Principal Investigator. *Standard practice for validation and calibration of walkway or shoe surface tribometers using reference surfaces* (**\$58,700**)

9/30/15-5/31/18: NIH-NIA: R44AG052199-02A1. Co-Principal Investigator. *An innovative tool for assessment of gait dysfunction in the clinical setting* (**\$746,759**)

Previous Grant Support

2015-2016: USC Division of Biokinesiology & Physical Therapy Pilot Grant. Co-Principle Investigator. Brain connectivity associated with lower limb coordination deficits (**\$15,000**)

2014-2016: Medhab Inc. Principle Investigator. Comparative effectiveness of an activity-specific monitoring device (StepRite) on short term outcomes in adults after total knee arthroplasty (**\$161,419**)

2012-2013: NIH-NICHD: R13HD074380. Co-Principal Investigator. *Regenerative Medicine in Rehabilitation* (**\$15,000**)

2011-2012: NIH-NICHD: R43HD068147-01. Co-Principal Investigator. *An innovative tool for assessment of gait dysfunction in the clinical setting* (**\$150,000**)

2011-2012: NIH-NIBIB: R13EB013939-01. Principal Investigator. 35th Annual Meeting of American Society of Biomechanics. (**\$10,000**)

2009-2010: NIH-NICHD/NIAMS: R13HD062117-01. Principal Investigator. *New concepts on mechanisms underlying disordered movement: Force generation impairments.* (**\$8,000**)

2007-2008: DJ Orthopaedics Inc., Principal Investigator. *The effects of femoral strapping on femoral rotation in persons with patellofemoral pain.* (**\$22,600**)

2006-2008: American Society for Testing and Measures. Principal Investigator. *Standard practice for validation and calibration of walkway or shoe surface tribometers using reference surfaces* (**\$12,000**)

2005-2010: NIH-NIAMS: R01AR053073-01A1. Principal Investigator. *Mechanics of non-contact ACL injuries in female athletes.* (**\$1,002,379**)

2003-2006: Whitaker Foundation. Principal Investigator. *Biomechanical determinants of patellofemoral stress.* (**\$221,446**)

2003-2005: Department of Veteran Affairs. Paid Consultant (PI Beaupre). Patellofemoral joint biomechanics and rehabilitation. (**\$445,700**)

2003-2005: Foundation for Physical Therapy Inc. Co-Investigator (PI Winstein). *A clinical research network to evaluate the efficacy of physical therapist practice.* (**\$1,500,000**)

2002-2003: National Athletic Trainers Association. Principal Investigator. *Biomechanical and neuromuscular aspects of non-contact ACL injuries: The influence of gender, experience and training.* (**\$52,501**)

2001-2002: California Physical Therapy Fund Inc. Co-Investigator (PI Burnfield). *Coefficient of friction requirements during ambulation: Influence of disability and task in older persons.* **(\$2,500)**

2001-2002: DJ Orthopaedics Inc., Principal Investigator. *The Influence of the On-Track Patellofemoral Brace on Patellofemoral Stress during Functional Activities.* **(\$10,000)**

2001-2002: Foundation for Physical Therapy Inc., Principal Investigator. *The effects of a single intervention session on pain response and lumbar segmental mobility in persons with low back pain: A comparison of spine mobilization and active extension using dynamic MRI.* **(\$40,000)**

2000-2002: Breg Corp., Principal Investigator. *The influence of patellar bracing on patellofemoral alignment and contact area.* **(\$10,000)**

2000-2001: University of Southern California, James H. Zumberge Interdisciplinary Research Grant. Co-principal Investigator. *Human movement representation using subject specific modeling.* **(\$49,847)**

2000-2001: Bauerfeind Corp/ Breg Corp. Co-principal Investigator. *Evaluation of the Bauerfeind Genutrain P3 Brace and the Breg patellar stabilization brace using upright kinematic MRI: A comparison of open and closed chain exercises* **(\$40,000)**

1999-2000: American Physical Therapy Association, New Investigator Fellowship Training Initiative Grant. Co-principal Investigator. *Biomechanical Determinants of Patellofemoral Stress* **(30,000)**

1999-2000: University of Southern California, James H. Zumberge Research Grant. Principal Investigator; *Quantification of patellofemoral joint stress using an imaging-based biomechanical model* **(\$24,653)**

1998-1999: Stryker-Osteonics Inc. Co-principal Investigator. *Does femoral interlocking-compression nailing alter pain and weight bearing in the early post-operative period?* **(18,000)**

1999: California Physical Therapy Fund Inc., Co-principal Investigator. *The effects of patellofemoral pain and patellar taping on knee kinetics and vasti EMG during stair ambulation* **(\$1,466)**

1998: University of Southern California, James H. Zumberge Interdisciplinary Research Grant. Co-Principal Investigator. *Contribution of the upper limbs to dynamic posture control in post-stroke hemiparetic adults.* **(\$10,000)**

1997: California Physical Therapy Fund Inc., Co-principal Investigator (PI Burke). *The relationship between glenohumeral rhythm and subacromial impingement syndrome* **(\$2,500).**

1995: California Physical Therapy Fund Inc., Co-principal Investigator (PI Reischl). *The effects of foot pronation on transverse plane motion of the tibia and femur during free walking* **(\$2,500).**

1993: Bauerfeind Corp., Co-principal Investigator. *Evaluation of the Bauerfeind Genutrain P3 Brace by kinematic MRI, EMG, functional testing and clinical criteria* **(\$75,000).**

1993: California Physical Therapy Fund Inc., Principal Investigator. *The effects of patellar taping on functional outcomes in subjects with patellofemoral pain* **(\$2,300).**

1992: California Physical Therapy Fund Inc., Principal Investigator. *The timing of vasti activity in subjects with patellofemoral pain: An electromyographic study* **(\$2,000).**

Patents

Device and method for externally rotating the femur. US & International Patent #20070219478. (License agreement with Don Joy Orthopaedics Inc. through USC Stevens Center for Innovation)

Published Papers in Peer-Reviewed Journals

h-index=64 (Google Scholar) & 47 (Thomson Reuters Researcher ID)

***Student/Post-doc under supervision at the time data was collected; Underline indicates senior author**

1. Atkins LT, James CR, Yang HS, Sizer P, Brismee JM, Sawyer S, **Powers CM**. Changes in patellofemoral pain resulting from repetitive impact landings are associated with the magnitude and rate of patellofemoral loading. *Clin Biomech.* 53:31-36, 2018
2. Tsai LC,* Ko YA, Hammond KE, Xerogeanes JW, Warren GL, **Powers CM**. Increasing hip and knee flexion during a drop landing task reduces tibiofemoral shear and compressive forces: Implications for ACL injury prevention training. *J Sports Sci.* 35:2405-2411, 2017.
3. **Powers CM**, Ghoddosi N, Straub RK, Khayambashi K. Hip strength as a predictor of ankle sprains in male soccer players: A prospective study. *J Athl Train.* 52:1048-1055, 2017.
4. Pollard CD,* Sigward SM,* **Powers CM**. ACL injury prevention training results in decreased reliance on the knee extensors and greater utilization of the hip extensors during a drop-landing task. *Ortho J Sports Med.* 5:2325967117726267, 2017.
5. **Powers CM**, Witvrouw E, Davis I, Crossley K. Evidence-based framework for a pathomechanical model of patellofemoral pain: 2017 patellofemoral pain consensus statement from the 4th International Patellofemoral Pain Research Retreat, Manchester UK. *Br J Sports Med.* 24:1713-1723, 2017.
6. Bagwell JJ,* **Powers CM**. The influence of squat kinematics and hip morphology on acetabular stress. *J Arthroscopy.* 33:1797-1803, 2017.
7. Crossley KM, Stefanik JJ, Selfe J, Collins NJ, Davis IS, **Powers CM**, McConnell J, Vicenzino B, Bazett-Jones DM, Esculier JF, Morrissey D, Callaghan MJ. 2016 Patellofemoral pain consensus statement from the 4th International Patellofemoral Pain Research Retreat. Part 1: Terminology, definitions, clinical examination, natural history, patellofemoral osteoarthritis and patient-reported outcome measures. *Br J Sports Med.* 50:839-843, 2016.
8. Selkowitz DM, Beneck GJ, **Powers CM**. Comparison of EM G activity of the superior and inferior portions of the gluteus maximus during common therapeutic exercises. *J Orthop Sports Phys Ther.* 46:794-799, 2016.
9. Yin L,* Liao TC,* Yang L, **Powers CM**. Does patella tendon tenodesis improve tibial tubercle distalization in treating patella alta? A computational study. *Clin Orthop Relat Res.* 474:2451-2461, 2016.
10. Teng HL,* **Powers CM**. Hip extensor strength, trunk posture and use of the knee extensor muscles during running. *J Athl Train.* 51:519-524, 2016.
11. Bagwell JJ,* Snibbe J, Gerhardt M, **Powers CM**. Comparison of hip kinematics and kinetics in persons with and without cam femoroacetabular impingement during a deep squat task. *Clin Biomech.* 31:87-92, 2016.
12. Bagwell JJ,* Fukuda T, **Powers CM**. Sagittal plane pelvis motion influences transverse plane motion of the femur: Kinematic coupling at the hip joint. *Gait & Posture.* 43:120-124, 2016.

13. Khayambashi K, Ghoddosi N, Straub RK,* **Powers CM**. Hip muscle strength predicts non-contact ACL injury in male and female athletes: A prospective study. *Am J Sports Med.* 44:355-361, 2016.
14. Hashish R, Samarawickrame S, **Powers CM**, Salem GJ. Lower limb dynamics in habitually shod runners who acutely transition to barefoot running. *J Biomech.* 49:284-288, 2016.
15. Fisher BE, Southam AC,* Lee YY, **Powers CM**. Evidence of altered corticomotor excitability following targeted activation of gluteus maximus training in health individuals. *Neuroreport.* 27:415-421, 2016.
16. Liao TC,* Yang N, Ho KY, Farrokhi S, **Powers CM**. Femur rotation increases patella cartilage stress in females with patellofemoral pain. *Med Sci Sport Exerc.* 47:1775-1780, 2015.
17. Blanchette MG,* **Powers CM**. The influence of footwear tread groove parameters on available friction. *Appl Ergon.* 50:237-241, 2015.
18. Blanchette MG,* **Powers CM**. Slip prediction accuracy and bias of the SATA STM 603 whole shoe tester. *J Testing and Evaluation.* 43:491-498, 2015.
19. Lyle MA,* Valero-Cuevas FJ, Gregor RJ, **Powers CM**. Lower extremity dexterity is associated with agility in adolescent soccer athletes. *Scand J Med Sci Sport.* 25:81-88, 2015.
20. Lathan C, Myler A, Peterson J,* **Powers CM**, **Fisher BE**. Pressure-controlled treadmill training in chronic stroke: A case study. *J Neuro Phys Ther.* 39:127-133, 2015.
21. Teng HL,* **Powers CM**. Influence of trunk posture on lower extremity energetics during running. *Med Sci Sport Exerc.* 47:625-630, 2015.
22. Teng HL,* **Powers CM**. Sagittal plane trunk posture influences patellofemoral joint stress during running. *J Orthop Sports Phys Ther.* 44:785-792, 2014.
23. Ho KY,* Hu HH, Colletti PM, **Powers CM**. Running-induced patellofemoral pain fluctuates with changes in patella water content. *Eur J Sport Sci.* 14:628-634, 2014.
24. Chen YJ,* **Powers CM**. Comparison of three dimensional patellofemoral joint reaction forces in persons with and without patellofemoral pain. *J Appl Biomech.* 30:493-500, 2014
25. Ho KY,* Hu HH, Colletti PM, **Powers CM**. Recreational runners with patellofemoral pain exhibit elevated patella water content. *Magn Res Imag.* 44:320-327, 2014.
26. **Powers CM**, Ho KY,* Chen YJ,* Souza RB,* Farrokhi S.* Patellofemoral joint stress during weightbearing and non-weightbearing quadriceps exercises. *J Orthop Sports Phys Ther.* 44:320-327, 2014.
27. Khayambashi K, Fallah A, Movahedi A, Bagwell J,* **Powers CM**. Posterolateral hip muscle strengthening versus quadriceps strengthening for patellofemoral pain: A randomized controlled trial. *Arch Phys Med Rehabil.* 95:900-907, 2014.
28. Stearns KM,* **Powers CM**. Improvements in hip muscle performance result in increased utilization of the hip extensors and abductors during a landing task. *Am J Sports Med.* 42:602-609, 2014
29. Lee SP,* **Powers CM**. Individuals with diminished hip abductor strength exhibit altered ankle biomechanics and neuromuscular activation during unipedal balance tasks. *Gait Posture.* 39:933-938, 2014.

30. Ho, KY,* Keyak JH, **Powers CM**. Comparison of patella bone strain between females with and without patellofemoral pain; A finite element analysis study. *J Biomech.* 47:230-236, 2014.
31. Lyle MA,* Valero-Cueva FJ, Gregor RJ, **Powers CM**. Control of dynamic foot-ground interactions in male and female soccer athletes: Females exhibit lower dexterity and higher limb stiffness during landing. *J Biomech.* 47:512-517, 2014.
32. Teng, HL,* Chen YJ,* **Powers CM**. Predictors of patella alignment: An examination of patella height and trochlea geometry. *The Knee.* 21:142-146, 2014.
33. Witrouw E, Callaghan MJ, Stefanik JJ, Noehren B, Bazett-Jones DM, Willson JD, Earl-Boehm JE, Davis IS, **Powers CM**, McConnell J, Crossley KM. Patellofemoral pain: Consensus statement from the 3rd International Patellofemoral Pain Research Retreat. *Br J Sports Med*, 48:411-414, 2014.
34. Nakagawa TH,* Maciel CD, Serrao FV, **Powers CM**. Hip and knee kinematics are associated with pain and functional status in males and females with patellofemoral pain. *Int J Sport Med.* 34:997-1002, 2013.
35. Stefanik JJ, Zhu Y, Zumwalt AC, Segal NA, Lynch JA, Lewis CE, Guermazi A, Felson DT, **Powers CM**. Association between measures of patella height, trochlear morphology and patellofemoral joint alignment: The MOST study. *Clin Orthop Rel Res.*471:2641-2648, 2013.
36. Lee SP,* **Powers CM**. Fatigue of the hip abductors results in increased medial-lateral center of pressure excursion and altered peroneus longus activation during a unipedal landing task. *Clin Biomech.* 28:524-529, 2013.
37. Tsai LC,* Scher IS, **Powers CM**. Quantification of tibiofemoral shear and compressive loads using a MRI-based EMG-driven knee model. *J Appl Biomech.*29:229-234, 2013.
38. Lee SP,* **Powers CM**. Description of a weightbearing method to assess hip abductor muscle performance. *J Orthop Sports Phys Ther.*43:392-397, 2013.
39. Stearns KM,* **Powers CM**. Influence of relative hip and knee extensor muscle performance on lower extremity biomechanics during landing: *Med Sci Sports Exerc.* 45:935-941, 2013.
40. Fisher BE, Lee YY, Pittsch EA, Moore B, Faw T, **Powers CM**. Method for assessing brain changes associated with gluteus maximus activation. *J Orthop Sports Phys Ther.* 43:214-221, 2013.
41. Wong YM,* Straub RK,* **Powers CM**. The VMO:VL activation ratio while squatting with hip adduction is influenced by the choice of recording electrode. *J Electromyogr Kinesiol.* 23:443-447, 2013.
42. Lyle MA,* Valero-Cuevas FJ, Gregor RJ, **Powers CM**. The lower extremity dexterity test as a measure of lower extremity dynamical capability. *J Biomech.* 46:998-1002; 2013.
43. Tsai YJ,* **Powers CM**. The influence of footwear sole hardness on slip characteristics and slip-induced falls in young adults. *J Forensic Sci.* 58:46-50, 2013.
44. Selkowitz DM, Beneck GJ, **Powers CM**. Which exercises target the gluteal muscles while minimizing activation of the tensor fascia lata? Electromyographic assessment using fine-wire electrodes. *J Orthop Sports Phys Ther.* 43:54-64, 2013.
45. Tsai LC,* **Powers CM**. Increased hip and knee flexion during landing decreases tibiofemoral compressive forces in females who have undergone anterior cruciate ligament reconstruction. *Am J Sports Med.* 41:423-429, 2013.

46. Ho KY,* Hu HH, Keyak KH, Colletti PM, **Powers CM**. Measuring bone mineral density with fat-water MRI: Comparison with computed tomography. *J Magn Reson Imag*. 37:237-242, 2013.
47. Tsai LC,* McLean S, Colletti PM, **Powers CM**. Greater muscle co-contraction results in increased tibiofemoral compressive loads following anterior cruciate ligament reconstruction. *J Orthop Res*. 30:2007-2014, 2012.
48. Sigward SM, Pollard CD,* Havens K, **Powers CM**. The influence of sex and maturation on knee mechanics during side-step cutting. *Med Sci Sports Exerc*. 44:1497-1503, 2012.
49. Lee SP,* Souza RB,* **Powers CM**. The influence of hip abductor muscle performance on dynamic postural stability in females with patellofemoral pain. *Gait Posture*. 36:425-429, 2012.
50. Leahy IM, **Powers CM**. Chondral lesion of the patella. *J Orthop Sports Phys Ther*.42:291, 2012.
51. Sigward SM,* Pollard CD,* **Powers CM**. The influence of sex and maturation on landing biomechanics: Implications for anterior cruciate ligament injury. *Scand J Med Sci Sports* 22:502-509, 2012.
52. Ho KY,* Blanchette MG,* **Powers CM**. The influence of heel height on patellofemoral joint kinetics during walking. *Gait Posture*. 36:271-275, 2012.
53. Foster AA,* Blanchette MG,* Chou YC,* **Powers CM**. The influence of heel height on frontal plane ankle biomechanics: Implications for lateral ankle sprains. *Foot Ankle Int*. 33:64-69, 2012.
54. Tsai LC,* Colletti P, **Powers CM**. MRI measured muscle parameters improve knee moment predictions of an EMG-driven model. *Med Sci Sports Exerc*. 44:305-312, 2012.
55. Khayambashi K, Mohammadkhani Z, Ghaznavi K, Lyle MA,* **Powers CM**. The effects of isolated hip abductor and external rotator muscle strengthening on pain, health status, and hip strength in females with patellofemoral pain. *J Orthop Sports Phys Ther*. 42:22-29, 2012.
56. **Powers CM**, Bolgla LA, Callaghan M, Collins N, Sheehan F. Patellofemoral pain: proximal, distal and local factors. Consensus statements from the 2nd International Patellofemoral Research Retreat. *J Orthop Sports Phys Ther*. 42:A1-A54, 2012.
57. Stefanik JJ, Zhu Y, Zumwalt AC, Gorss KD, Clancy M, Lynch JA, Segal NA, Lewis CE, Roemer FW, Guermazi A, **Powers CM**, **Felson DT**. Association between measures of trochlear morphology and structural features of patellofemoral joint osteoarthritis on MRI: The MOST study. *J Orthop Res*. 30:1-8, 2012.
58. Sigward SM, Havens K, **Powers CM**. Knee separation distance and lower extremity kinematics during a drop land: Implications for clinical screening. *J Athl Train*. 46:471-75, 2011.
59. Lyle M,* Pollard CD,* Sigward SM,* **Powers CM**. The influence of maturation on instep kick biomechanics in female soccer athletes. *Med Sci Sports Exerc*. 43:1948-1954, 2011.
60. Woollard JD, Gil AB, Sparto P, Kwok CK, Piva SR, Farrokhi, S,* **Powers CM**, **Fitzgerald GK**. Change in knee cartilage volume in individuals completing a therapeutic exercise program for knee osteoarthritis: A case series *J Orthop Sports Phys Ther*. 41:708-722, 2011.

61. Stefanik JJ, Guermazi A, Zhu Y, Zumwalt AC, Gorss KD, Clancy M, Lynch JA, Segal NA, Lewis CE, Roemer FW, Guermazi A, **Powers CM**, Felson DT. Quadriceps weakness, patella alta and structural features of patellofemoral osteoarthritis: The MOST study. *Arthritis Care Res.* 63:1391-1397, 2011.
62. Blanchette MG,* Brault JR, **Powers CM**. The influence of heel height on utilized coefficient of friction during walking. *Gait Posture.* 34:107-110, 2011.
63. Chinkulprasert C,* Vachalathiti R, **Powers CM**. Patellofemoral joint forces and stress during forward step-up, lateral step-up and forward step-down exercises. *J Orthop Sports Phys Ther.* 41:241-248, 2011.
64. Farrokhi S,* Keyak JH, **Powers CM**. Individuals with patellofemoral pain exhibit greater patellofemoral joint stress: A finite element analysis study. *Osteoarthritis Cartilage.* 19:287-294, 2011.
65. Farrokhi S,* Colletti PM, **Powers CM**. Differences in patella cartilage thickness, T₂ relaxation time and cartilage deformational behavior: A comparison of young females with and without patellofemoral pain. *Am J Sports Med.* 39:384-391, 2011.
66. Chen YJ,* Scher I, **Powers CM**. Quantification of patellofemoral joint reaction forces during functional tasks: A subject specific, three dimensional model. *J Appl Biomech.* 26:415-423, 2010.
67. Kulig K, Harper-Hanigan K, Souza RB,* **Powers CM**. Measurement of femoral torsion by ultrasound and magnetic resonance imaging: Concurrent validity. *Phys Ther.* 90:1641-1648, 2010.
68. Stefanik JJ, Zhu Y, Zumwalt AC, Gross KD, Clancy M, Lynch JA, Frey LA, Lewis CE, Roemer FW, **Powers CM**, Guermazi A, Felson DT. The association between patella alta and the prevalence and worsening of structural features of patellofemoral joint osteoarthritis: The Multicenter Osteoarthritis Study. *Arthritis Care Res.* 62:1258-1265, 2010.
69. Souza RB,* Draper CE, Fredericson M, **Powers CM**. Femur rotation and patellofemoral joint kinematics: A weight-bearing MRI analysis. *J Orthop Sports Phys Ther.* 40:277-285, 2010.
70. **Powers CM**, Chen YJ,* Scher I, Lee TQ. Multi-plane loading of the extensor mechanism alters the patellar ligament force/quadriceps force ratio. *J Biomed Eng.* 132:024503, 2010.
71. Fithian DC, **Powers CM**, Khan N. Rehabilitation of the knee following medial patellofemoral ligament reconstruction. *Clin Sports Med.* 29:283-290, 2010.
72. **Powers CM**, Blanchette MG,* Brault JR, Flynn J, Siegmund GP. Validation of walkway tribometers: Establishing a reference standard. *J Forensic Sci.* 55:366-370, 2010.
73. **Powers CM**. The influence of abnormal hip mechanics on knee injury: A biomechanical perspective. *J Orthop Sports Phys Ther.* 40:42-51, 2010.
74. Wagner T, Behnia N, Ancheta WL, Shen R, Farrokhi S,* **Powers CM**. Strengthening and neuromuscular re-education of the gluteus maximus in a triathlete with exercise-association cramping of the hamstrings: A case report. *J Orthop Sports Phys Ther.* 40:112-119, 2010.
75. **Powers CM**, Fisher B. Mechanisms underlying ACL injury-prevention training: The brain-behavior relationship. *J Athl Train.* 45:513-515, 2010.
76. Tonley JC, Dye JA, Kochevar RJ, Yun SM, Farrokhi S,* **Powers CM**. Treatment of an individual with piriformis syndrome focusing on hip muscle strengthening and movement re-education: A case report. *J Orthop Sports Phys Ther.* 40:103-111, 2010.

77. Pollard CD,* Sigward SM, **Powers CM**. Limited hip and knee flexion during landing is associated with increased frontal plane knee motion and moments. *Clin Biomech*. 25:142-146, 2010.
78. Davis IS, **Powers CM**. Patellofemoral Pain Syndrome: Proximal, Distal and Local Factors. Consensus statements from the 2009 International Patellofemoral Research Retreat. *J Orthop Sports Phys Ther*. 40:A1-A48, 2010.
79. Tsai LC,* Sigward SM, Pollard CD,* Fletcher MJ, **Powers CM**. The effects of fatigue and recovery on knee kinetics and kinematics during side-step cutting. *Med Sci Sports Exerc*. 41:1952-1957, 2009.
80. **Kulig K**, Beneck GJ, Selkowitz DM, Popovich JM Jr., Ge TT, Flanagan SP, Poppert EM, Yamada K, **Powers CM**, Azen S, Winstein CJ, Gordon J, Samudrala S, Chen TC, Shamie N, Khoo L, Spoonamore MJ, Wang JC and Physical Therapy Clinical Research Network (PTClinResNet), An intensive, progressive exercise program reduces disability and improves functional performance in patients after single-level lumbar microdiscectomy. *Phys Ther*. 89:1145-1157, 2009.
81. Tsai YJ,* **Powers CM**. Increased shoe sole hardness results in compensatory changes in the utilized coefficient of friction during walking. *Gait Posture*. 30:303-306, 2009.
82. Souza RB,* **Powers CM**. Concurrent criterion-related validity and reliability of a clinical test to measure femoral anteversion. *J Orthop Sports Phys Ther*. 39:586-592, 2009.
83. Souza RB,* **Powers CM**. Predictors of hip rotation during running: An evaluation of hip strength and femoral structure in women with and without patellofemoral pain. *Am J Sports Med*. 37:579-587, 2009.
84. Souza RB,* **Powers CM**. Differences in hip kinematics, muscle strength and muscle activation between subjects with and without patellofemoral pain. *J Orthop Sports Phys Ther*. 39:12-19, 2009.
85. Sigward SM, Ota S,* **Powers CM**. Predictors of frontal plane knee excursion during a drop landing in young female soccer players. *J Orthop Sports Phys Ther*. 38:661-667, 2008.
86. Austin A, Souza RB,* Meyer J, **Powers CM**. Identification of abnormal hip motion associated with acetabular labral pathology: A resident's case report. *J Orthop Sports Phys Ther*. 38:558-565, 2008.
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1. Liao TC,* Keyak JH, **Powers CM**. Recreational runners with patellofemoral pain exhibit greater peak patella cartilage stress: A finite element analysis study. *J Appl Biomech.*
2. Stearns KM,* **Powers CM**. Rate of torque development and feedforward control of the hip and knee extensors: Gender differences. *J Motor Behav.*
3. Huang CH,* Schroeder ET, **Powers CM**. Anti-gravity treadmill training during the early rehabilitation phase following unicompartmental knee arthroplasty: A case series. *Physiother Theory Pract.*
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5. Harput G, Guney-Deniz H, Duzgun I, Toprak U, Michener L, **Powers CM**. The influence of active scapular retraction on acromio-humeral distance at various degrees of shoulder abduction. *J Athl Train.*

Manuscripts in Review or in Revision

1. Liao TC,* Yin L,* **Powers CM**. The influence of femur and tibia rotations on patella cartilage stress: A sensitivity analysis. *Clin Biomech*.
2. Blanchette MG,* **Powers CM**. The influence of footwear tread orientation on slip outcome and slip severity. *J Testing and Evaluation*
3. Bolgla LA, Boling MC, DiStefano MJ, Mace KD, Fithian DC, **Powers CM**. National Athletic Trainers's Association Position Statement: Management of Individuals with Patellofemoral Pain. *J Athl Train*.

Abstracts Submitted

1. Selkowitz DM, Beneck GJ, Robinson C, **Powers CM**. Hip muscle activation in persons with patellofemoral pain during the side-step exercise: Is Resistance important? Submitted to the *Annual Meeting of the International Society of Electrophysiology and Kinesiology* (1/18)
2. Liu J, Teng HL, **Powers CM**. Knee valgus angles during the stance phase of running: A late swing phase problem? Submitted to the *Annual Meeting of the European College of Sport Science* (1/18).

Abstracts Accepted

1. Shih Y, **Powers CM**, Smith JA, Fisher BE. Variability of motor evoked potential of gluteus maximus and vastus lateralis using transcranial magnetic stimulation. To be presented at the *Combined Sections Meeting of the American Physical Therapy Association* (6/17).
2. Michener LA, Plummer HA, Oliver GD, **Powers CM**. Trunk lean during a single leg squat is associated with trunk lean during pitching. To be presented at the *Combined Sections Meeting of the American Physical Therapy Association* (6/17).

Published Abstracts Last 5 Years (242 since 1993)

1. Liu J, Teng HL, **Powers CM**. Sex differences in hip extensor muscle activation during the late swing phase of running: Implications for altered frontal plane hip kinematics. Proceedings of the *2017 Meeting of the International Society of Biomechanics*. (7/17)
2. Lee J, Dang K, **Powers CM**. Heel acceleration differentiates fallers from non-fallers following a slip perturbation. Proceedings of the *Annual meeting of the European Society of Biomechanics*. (7/17)
3. Lee J, Dang K, Cohen A, **Powers CM**. A comparison of two methods to assess EMG latencies following a slip perturbation. Proceedings of the *Annual meeting of the European Society of Biomechanics*. (7/17)
4. Selkowitz DM, Beneck GJ, Robinson C, **Powers CM**. Differences in muscle activation between persons with and without patellofemoral pain during the clam exercise using elastic resistance. Proceedings of the *5th International Patellofemoral Pain Research Retreat*. (7/17)
5. Selkowitz DM, Beneck GJ, **Powers CM**. Comparison among different positions for maximizing EMG activity of the gluteal muscles in persons with PFP. Proceedings of the *5th International Patellofemoral Pain Research Retreat*. (7/17)
6. Liao TC, **Powers CM**. Recreational runners with patellofemoral pain exhibit greater patella cartilage stress: A finite element analysis study. Proceedings of the *5th International Patellofemoral Pain Research Retreat*. (7/17)
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23. Liao, TC, Farrokhi S, **Powers CM**. The influence of femur and tibia rotations on patellofemoral stress. *Proceedings of the 4th Annual International Patellofemoral Pain Research Retreat* (9/15).
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26. Shih Y, Teng HL, **Powers CM**. Predictors of loading rate in heel-strike runners. *Proceedings of the Annual Meeting of the American Society of Biomechanics* (8/15).
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39. Teng HL, **Powers CM**. The influence of trunk flexion on hip and knee kinetics and energetics. *Proceedings of the XXIV Congress of the International Society of Biomechanics*. (8/13).
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41. Peterson J, Snibbe J, **Powers CM**. Are the results of the FABER test associated with radiographic measures used to diagnose femoroacetabular impingement? *Proceedings of the Combined Sections Meeting of the American Physical Therapy Association* (2/13).
42. Cesar GM, Havens K, Bogdanoff S, **Powers CM**, Pollard C, Sigward S. Effect of cutting angle and sex on knee valgus moment. *Proceedings of the Combined Sections Meeting of the American Physical Therapy Association* (2/13).

Accepted Abstracts

1. Bagwell J, Ho KY, **Powers CM**. Finite element analysis of the tibial tuberosity osteotomy with anteromedialization procedure for patella instability. *Annual meeting of the American Society of Biomechanics*. (To be presented 8/17).
2. Liu J, Teng HL, **Powers CM**. Sex differences in hip extensor muscle activation during the late swing phase of running: Implications for altered frontal plan hip kinematics. *Annual meeting of the American Society of Biomechanics*. (To be presented 8/17).

Published Books, Chapters & Monographs

1. Davis IS, **Powers CM**, Tenforde A, Sing JR. A Tale of two treatments for patellofemoral pain. *Phys Med Rehabil*. 9:1283-1289, 2017
2. **Powers CM**, Souza RB, Fulkerson JP. Patellofemoral Joint. In: Magee DJ, Zachezewski JE, Quillen WS, Manske RC (eds), *Pathology and Intervention in Musculoskeletal Rehabilitation*, 2nd Ed. Elsevier, Maryland Heights, MD, 2016, pf. 798-835.
3. Khan N, Fithian D, **Powers CM**. Nonoperative rehabilitation of patella instability. In: Reider BC, Davies GJ & Provencher MT (Eds), *Orthopaedic Rehabilitation of the Athlete: Getting Back in the Game*. Elsevier, New York, NY, 2015, pg. 931-934.
4. Suzuki K, Pifer M, Khan N, Fithian D, **Powers CM**. Postoperative rehabilitation after proximal realignment procedures and medical patellofemoral ligament (MPFL) reconstruction. In: . In: Reider BC, Davies GJ &

- Provencher MT (Eds), *Orthopaedic Rehabilitation of the Athlete: Getting Back in the Game*. Elsevier, New York, NY, 2015, pg. 934-940.
5. Van der Wees, PJ, Maher CG, Moore AP, **Powers CM**, Stewart A, Nijhuis-vander Sanden M, De Bie RA. Development of clinical guidelines in physical therapy: Perspective for international collaboration *Phys Ther*. 91:1551-1563, 2011.
 6. Goldstein MS, Scalzitti DA, Bohmert JA, Brennan GP, Craik RL, Delitto A, Field-Fote EC, Magistro CM, **Powers CM**, Shields RK. Vitalizing practice through research and research through practice: The outcomes of a conference to enhance delivery of care. *Phys Ther*. 91:1275-1284, 2011.
 7. **Powers CM**, Berke GM, Clary MD, Fredericson M. Patellofemoral pain: Is there a role for orthoses? *Phys Med Rehabil*. 2:771-776, 2010.
 8. **Powers CM**, Souza RB, Fulkerson JP. Patellofemoral Joint. In: Magee DJ, Zachazewski JE, Quillen WS (Eds) *Pathology and Intervention in Musculoskeletal Rehabilitation*. Saunders Elsevier, St. Louis, MO, 2008, pg. 601-636
 9. **Powers CM**, Pollard CD, Sigward SM. Effect of Prevention Programs on Performance. In: Hewett TE, Shultz SJ, Griffin LY (Eds) *Understanding and Preventing Noncontact ACL Injuries*. Human Kinetics, Champaign, IL, 2007, pg. 103-108.
 10. Cormack J, **Powers CM**. Is there evidence that botulinum toxin injections are more effective than phenol injections in relieving post-stroke reflex activity during plantarflexion, thereby increasing ankle range of motion and improving gait function? *Phys Ther*. 84:76-84, 2004.
 11. Redfern MS, Cham R, Gielo-Perczak K, Gronqvist R, Hirvonen M, Lanshammar H, Marpet M, Pai YC, **Powers CM**. Biomechanics of slips. In: Chang WR, Courtney TK (Eds) *Measuring Slipperiness: Human Locomotion and Surface Factors*. Taylor & Francis, New York, NY, 2003, pg. 37-66.
 12. **Powers CM**, Farrokhi, S, Moreno J. Can exercise reduce the incidence of falls in the elderly, and, if so what form of exercise is most effective? *Phys Ther*. 82:1124-1130, 2002.
 13. **Powers CM**, Burnfield JM. Normal and Abnormal Gait. In: Placzek J, Boyce D (Eds) *Orthopaedic Physical Therapy Secrets*. Lamsback, Hanley & Belfus Inc. Philadelphia, PA, 2001, pg. 98-104.
 14. **Powers CM**. Preventing the Effects of Deconditioning: Exercise Prescription for the Elderly. In: Mezey MD, Bottrell MM, Berkman BJ, Callahan CM, Fulmer TT, Mitty EL, Paveeza GJ, Siegler EL, Strumpf NE (Eds) *Encyclopedia of Care of the Elderly: The Comprehensive Resource on Geriatric and Social Care*. Springer Publishing Co, New York, NY. 2001, pg. 186-188.
 15. Shellock FG, **Powers CM** (Eds). *Kinematic MRI of the Joints: Functional anatomy, kinesiology and clinical applications*. CRC Press, Boca Raton, FL. 2001.
 16. **Powers CM**. The Patellofemoral Joint: Normal anatomy and kinesiology. In Shellock FG, Powers CM (Eds) *Kinematic MRI of the joints: Functional Anatomy, Kinesiology and Clinical Applications*. CRC Press, Boca Raton, FL. 2001, pg. 149-164.
 17. Shellock FG, **Powers CM**. Kinematic MRI of the Patellofemoral Joint. In Shellock FG, Powers CM (Eds) *Kinematic MRI of the Joints: Functional Anatomy, Kinesiology and Clinical applications*. CRC Press, Boca Raton, FL. 2001, 165-204.

18. **Powers CM.** Patellofemoral Joint Disorders. In: Wadsworth C, Shankman G (Eds) *The Knee: A Home Study Course*. Orthopaedic Section, American Physical Therapy Association, 2000, pg. 1-29.

Invited Commentaries & Editorials

1. Lumbopelvic manipulation for the treatment of patients with patellofemoral pain syndrome: Development of a clinical prediction rule. (Invited commentary). *J Orthop Sports Phys Ther.* 38:309-310, 2008.
2. Priorities for orthopaedic and sports physical therapy research: Assessing outcomes or understanding mechanisms? (Guest editorial). *J Orthop Sport Phys Ther.* 33:219-220, 2003.
3. Who is responsible for the science of orthopaedic and sports physical therapy? (Guest editorial). *J Orthop Sport Phys Ther.* 27:329-330, 1998.

Scientific Presentations

1. Femoroacetabular Impingement: A theoretical framework to guide clinical practice. *Combined Sections Meeting of the American Physical Therapy Association.* New Orleans, LA (2/18).
2. Recreational runners with patellofemoral pain exhibit greater patella cartilage stress: A finite element analysis study. *5th International Patellofemoral Pain Research Retreat.* Gold Coast, Australia (7/17)
3. Is use of a single coefficient of friction threshold appropriate to establish whether a walkway is safe? *ASTM International Workshop on the Multifactorial Analysis of Slip and Fall Events.* West Conshohocken, PA (1/17).
4. Transforming society by optimizing movement: An Achievable vision for the profession? *Combined Sections Meeting of the American Physical Therapy Association.* San Antonio, TX (2/17).
5. A cognitive-biomechanical perspective for the management of common chronic musculoskeletal conditions. *Combined Sections Meeting of the American Physical Therapy Association.* San Antonio, TX (2/17).
6. Risk factors and conservative treatment for patella instability. *Patella Instability Workshop, American Orthopaedic Society for Sports Medicine.* Chicago, IL (9/16)
7. The core of the body: The role of the gluteal muscles in providing hip, pelvis and trunk stability. *Combined Sections Meeting of the American Physical Therapy Association.* Anaheim, CA (2/16).
8. Biomechanical analysis of tibial tubercle distalization and tibial tubercle distalization with patella tendon tenodesis for the treatment of patella alta. *International Patellofemoral Joint Study Group Meeting,* Chicago, IL (9/15).
9. Hip muscle strength predicts non-contact ACL injury in male and female athletes: A prospective study. *ACL Research Retreat VII,* Greensboro, NC (3/15)
10. Retraining movement behavior for ACL injury prevention and rehabilitation: A matter of strength or motor control? *Combined Sections Meeting of the American Physical Therapy Association.* Las Vegas, NV (2/14).
11. Biomechanical factors related to mechanical low back pain. *Combined Sections Meeting of the American Physical Therapy Association.* Las Vegas, NV (2/14).
12. Synopsis of the 3rd International Patellofemoral Research Retreat: Local Factors. *Combined Sections Meeting of the American Physical Therapy Association.* Las Vegas, NV (2/14).

13. Females exhibit increased feed-forward activation and diminished rate of torque development of the hip and knee extensors: Implications for ACL injury. *Combined Sections Meeting of the American Physical Therapy Association*. Las Vegas, NV (2/14).
14. Recreational runners with patellofemoral pain exhibit elevated patella water content. 3rd *International Patellofemoral Research Retreat*, Vancouver, Canada (9/13).
15. Proximal factors related to knee injury: Biomechanical influences. *Combined Sections Meeting of the American Physical Therapy Association*. Chicago, IL (2/13).
16. Functional biomechanics of the knee, hip and pelvis. *Annual Meeting of the American Physical Therapy Association*. Tampa, FL (6/12).
17. Select interventions for functional retraining of the hip, pelvis and knee. *Annual Meeting of the American Physical Therapy Association*. Tampa, FL (6/12).
18. Biomechanical basis of conservative treatment for patellofemoral pain. *Combined Sections Meeting of the American Physical Therapy Association*. Chicago, IL (2/11).
19. Dynamic evaluation of the lower extremity: Implications for patellofemoral joint dysfunction. Annual meeting of the *International Patellofemoral Joint Study Group*, San Diego, CA (7/11).
20. Bone and cartilage imaging: Insights into the mechanisms underlying patellofemoral pain. Annual meeting of the *International Patellofemoral Joint Study Group*, San Diego, CA (7/11).
21. Dynamic stabilization of the patellofemoral joint: Stabilization from above and below. Annual meeting of the *International Patellofemoral Joint Study Group*, San Diego, CA (7/11).
22. The dynamic Q-angle: Lower chain influences. Annual meeting of the *International Patellofemoral Joint Study Group*, San Diego, CA (7/11).
23. Development of evidence based recommendations for physical therapy diagnosis and treatment. *World Congress of Physical Therapy*. Amsterdam, Netherlands (6/11).
24. A review of common interventions for patellofemoral joint dysfunction: A biomechanical approach. *Annual meeting of the American College of Sports Medicine*. Denver, CO (6/11).
25. Biomechanical factors underlying running injuries: Proximal and distal factors. Combined Sections Meeting of the American Physical Therapy Association. New Orleans, LA (2/11).
26. Movement dysfunction and lower extremity injury: A top down perspective. *Annual meeting of the American Physical Therapy Association*. Boston, MA (6/10).
27. Injury prevention training results in biomechanical changes consistent with decreased knee loading in female athletes during landing. *Annual Meeting of the American Society of Biomechanics*. College Station, PA (8/09).
28. The influence of relative hip and knee extensor strength on lower extremity biomechanics during a drop landing task. *Annual Meeting of the American Society of Biomechanics*. College Station, PA (8/09).
29. Tibiofemoral control: A matter of weakness. *Combined Sections Meeting of the American Physical Therapy Association*. Las Vegas, NV (2/09).

30. Patellofemoral joint stress: Patellofemoral pain, cartilage morphology & cartilage composition. Annual meeting of the *International Patellofemoral Joint Study Group*, Capetown South Africa (10/08).
31. The dynamic quadriceps angle: A comparison of persons with and without patellofemoral pain. Annual meeting of the *International Patellofemoral Joint Study Group*, Capetown South Africa (10/08).
32. Femoral rotation & patellofemoral joint kinematics: A comparison of females with and without patellofemoral pain using weightbearing MRI. Annual meeting of the *International Patellofemoral Joint Study Group*, Capetown South Africa (10/08).
33. The influence of abnormal hip mechanics on non-Contact ACL injuries. *Annual meeting of the American College of Sports Medicine*. Indianapolis, IN (5/08).
34. The biomechanics and muscle physiology of knee rehabilitation exercises. *Combined Sections Meeting of the American Physical Therapy Association*. Nashville, TN (2/08).
35. Abnormal lower extremity mechanics & patellofemoral dysfunction: Implications for treatment. *World Confederation of Physical Therapy*, Vancouver, Canada (6/07).
36. Changes in lower extremity movement patterns are accompanied by motor cortex neuroplasticity: A case report. *World Confederation of Physical Therapy*, Vancouver, Canada (6/07).
37. The contribution of abnormal hip mechanics to knee injury: A top-down perspective. *Combined Sections Meeting of the American Physical Therapy Association*. Boston, MA (2/07).
38. Pathomechanics of ACL injury: Implications for prevention and rehabilitation strategies. *Annual Meeting of the American Physical Therapy Association*. Orlando FL (6/06).
39. Influence of femoral anteversion on thigh segment kinematics in persons with patellofemoral pain during running. Annual meeting of the *International Patellofemoral Joint Study Group*, Boston, MA (5/06).
40. Assessment of walkway tribometer readings in evaluating slip resistance: A gait based approach. 19th Annual meeting of the *International Society for Occupational Ergonomics & Safety*, Las Vegas, NV (6/05).
41. Quantification of three-dimensional patellofemoral joint reaction forces during gait: A subject specific modeling approach. Annual meeting of the *International Patellofemoral Joint Study Group*, Lausanne, Switzerland (4/05).
42. Mechanics of knee injuries: Implications for rehabilitation. *Combined Sections Meeting of the American Physical Therapy Association*, New Orleans, LA, (2/05).
43. Weightbearing vs. non-weightbearing exercises for patellofemoral joint disorders. *Combined Sections Meeting of the American Physical Therapy Association*, New Orleans, LA, (2/05).
44. The influence of gender on knee kinematics, kinetics and muscle activation patterns during side-step cutting. Annual meeting of the *National Athletic Trainers Association*, Baltimore, MD, (6/04).
45. The influence of an ACL injury training program on knee mechanics during a side-step cutting maneuver. Annual meeting of the *National Athletic Trainers Association*, Baltimore, MD, (6/04).
46. Influence of hip mechanics on overuse injuries of the knee. *Combined Sections Meeting of the American Physical Therapy Association*, Nashville, TN, (2/04).

47. Insight into the lumbar spine's segmental mobility and manual assessment using dynamic MRI. *International Federation of Sports Physiotherapists*. Maastricht, Holland (12/03).
48. Assessment of abnormal lower extremity mechanics using observational gait analysis: A biomechanical approach. *International Federation of Sports Physiotherapists*. Maastricht, Holland (12/03).
49. Patellofemoral kinematics during weightbearing and non-weightbearing knee extension in persons with lateral subluxation of the patella: A preliminary study. Annual meeting of the *International Patellofemoral Joint Study Group*, Tampa, FL, Switzerland (7/03).
50. The effect of bracing on patellofemoral joint stress during stair ascent and descent in persons with patellofemoral pain. Annual meeting of the *American Physical Therapy Association*, Washington DC, (6/03).
51. Influence of hip mechanics on patellofemoral joint dysfunction: Implications for treatment. Annual meeting of the *American College of Sports Medicine*. San Francisco, CA (5/03).
52. The effects of a single intervention session on pain response and lumbar segmental mobility in persons with and without low back pain. *Combined Sections Meeting of the American Physical Therapy Association*, Tampa, FL (2/03).
53. Epidemiology of non-contact ACL injuries. *Combined Sections Meeting of the American Physical Therapy Association*, Tampa, FL (2/03).
54. Influence of the lower kinetic chain in contributing to patellofemoral disorders. *Combined Sections Meeting of the American Physical Therapy Association*, Boston, MA (2/02).
55. Assessment of patellofemoral joint mechanics using kinematic magnetic resonance imaging: Implications for clinical practice. Annual meeting of the *American Physical Therapy Association*, Anaheim, CA (6/01).
56. Comparison of utilized coefficient of friction requirements across walking conditions. *Symposium on Metrology of Pedestrian Locomotion and Slip Resistance*, West Conshohocken, PA (6/01).
57. Comparison of foot pronation and lower extremity rotation in persons with and without patellofemoral pain. *Combined Sections Meeting of the American Physical Therapy Association*, San Antonio, TX (2/01).
58. Current controversies in patellofemoral joint rehabilitation: Is emphasis on the VMO necessary? *Combined Sections Meeting of the American Physical Therapy Association*, San Antonio, TX (2/01).
59. Biomechanics of patellofemoral pain. Annual Meeting of the *Southwest Chapter of the American College of Sports Medicine*, San Diego, CA (11/00).
60. Comparison of coefficient of friction requirements during gait to tribometry measurements: Evaluation of shod and barefoot conditions at various walking speeds. *National Occupational Injury Research Symposium*, Pittsburgh, PA (10/00).
61. Patellofemoral joint kinetics during squatting in collegiate women athletes. Annual Meeting of the *American Physical Therapy Association*, Indianapolis, IN (6/00).
62. The effects of wearing shoes on the required coefficient of friction during walking. Annual Meeting of the *American Society of Testing and Measures*, West Conshohocken, PA, (6/00).

63. The vastus medialis oblique: Anatomical structure, anomaly, or myth? Annual Meeting of the *American College of Sports Medicine*, Indianapolis, IN, (6/00).
64. The influence of segmental coupling on patellofemoral joint mechanics. Annual Meeting of the *American College of Sports Medicine*, Indianapolis, IN, (6/00).
65. Comparison of coefficient of friction requirements during gait to standard tribometry measurements. Annual Meeting of the *American Academy of Forensic Science*, Reno, NV (2/00).
66. The influence of lower quarter mechanics on patellofemoral joint dysfunction. *Combined Sections meeting of the American Physical Therapy Association*, New Orleans, LA (2/00).
67. The effect of walking velocity on lower extremity impact angle and the required coefficient of friction. Annual meeting of the *American Society for Testing and Measures* (Committee F-13), West Conshohocken, NJ, (6/99).
68. The use of biomechanical modeling to characterize patients with patellofemoral pain: Implications for treatment and patient management. Annual meeting of the *American Physical Therapy Association*, Washington DC (6/99)
69. The effects of patellar taping on loading characteristics in subjects with patellofemoral pain. *Combined Sections meeting of the American Physical Therapy Association*, Seattle, WA (2/99).
70. Management of the patient with patellofemoral pain: A comparison of treatment strategies. *Combined Sections meeting of the American Physical Therapy Association*, Seattle, WA (2/99).
71. Precision and bias of the English XL and Mark II tribometers. Annual meeting of the *American Society for Testing and Measures* (Committee F13), West Conshohocken, NJ, 6/98.
72. The patellofemoral joint revisited: Controversies, challenges and clinical applications. Annual meeting of the *American Physical Therapy Association*, Orlando, FL, 6/98.
73. The effects of patellar bracing on clinical changes and gait characteristics in subjects with patellofemoral pain. Annual meeting of the *American Physical Therapy Association*, Orlando, FL, 6/98.
74. The effects of bracing on patellar kinematics in patients with patellofemoral pain. Annual Meeting of the *American College of Sports Medicine*, Orlando, FL, 6/98
75. Knee kinetics in trans-tibial amputee gait. Annual Meeting of the *North American Society for Gait and Clinical Movement Analysis*, San Diego, CA, 4/98.
76. The influence of bony stability on patellar tracking. Annual Meeting of the *American Academy of Orthopaedic Surgery*, New Orleans, LA, 3/98.
77. Biomechanical considerations in patients with neurologic dysfunction. *Combined Sections Meeting of the American Physical Therapy Association*, Boston, MA, 2/98.
78. Direct and indirect measures of knee joint demand. Annual Meeting of the *Biomedical Engineering Society*, San Diego, CA, 10/97.
79. The validity of an external measurement in determining the medial/lateral component of patellar orientation. Annual conference of the *American Physical Therapy Association*, San Diego, CA, 6/97.

80. The relationship between vasti EMG patterns and patellar tracking during active knee extension: Annual Meeting of the *American College of Sports Medicine*, Denver, CO, 5/97.
81. Quantification of foot pronation using 3D motion analysis. *Combined Sections Meeting of the American Physical Therapy Association*, Denver, CO, 2/97.
82. Biomechanical analysis of human motion: Implications for orthopaedic and neurologic rehabilitation. Annual Conference of the *Colorado Chapter of the American Physical Therapy Association*, Denver, CO, 11/96.
83. Factors contributing to abnormal patellofemoral joint mechanics: Implications for clinical practice. Annual Conference of the *California Chapter of the American Physical Therapy Association*, San Francisco, CA, 10/96.
84. The reliability of obtaining VL:VMO and VL:VML EMG ratios using indwelling wire electrodes. Annual Conference of the *American Physical Therapy Association*, Minneapolis, MN, 6/96.
85. Stair ambulation in individuals with trans-tibial amputations. Annual Meeting of the *North American Society of Gait and Clinical Movement Analysis*, Birmingham, AL, 4/96.
86. Quantification of patellar tracking using dynamic magnetic resonance imaging: Implications for research and clinical assessment. *Combined Sections Meeting of the American Physical Therapy Association*, Atlanta, GA, 2/96.
87. The effects of patellar bracing on gait parameters in subjects with patellofemoral pain. Annual Conference of the *California Chapter of the American Physical Therapy Association*, San Diego, CA, 10/95.
88. The effects of patellar taping on loading characteristics in subjects with patellofemoral pain. *12th International Meeting of the World Confederation for Physical Therapy*, Washington D.C., 6/95.
89. The effects of patellar taping on knee motion and stride characteristics in subjects with patellofemoral pain. *12th International Meeting of the World Confederation for Physical Therapy*, Washington D.C., 6/95.
90. Loading characteristics in subjects with patellofemoral pain. Annual Meeting of the *North American Gait Conference*, Waterloo, Ontario, Canada, 6/95.
91. The relationship between muscle strength and stride characteristics in dysvascular below-knee amputees. Annual Meeting of the *American Congress of Rehabilitation Medicine*, Arlington, VA, 6/95.
92. The effects of prosthetic foot design on sound limb loading in below-knee amputees. Annual Meeting of the *Orthopaedic Research Society*, New Orleans, LA, 2/94.
93. Prosthetic foot design for the dysvascular amputee. Annual Meeting of the *American Orthotics and Prosthetics Association*, Reno, NV, 10/93.

Invited Lectures & Keynote Addresses

1. *A pathomechanical model of patellofemoral pain*. Physical Stresses Symposium. Department of Rehabilitation Sciences, University of Oklahoma Health Sciences Center, Oklahoma City, OK (2/18)
2. *Mechanisms of ACL injury: Implications for evidence based rehabilitation and return to sport decisions*. (Invited speaker). Greater Los Angeles District, California Physical Therapy Association. Los Angeles, CA (10/17).

3. *Lower extremity movement impairments related to knee injury: Implications for injury prevention & rehabilitation.* Tricounties District, California Physical Therapy Association. Moorpark, CA (2/17).
4. *Mechanisms Underlying patellofemoral joint dysfunction: Insights through musculoskeletal imaging* (Invited speaker). Department of Rehabilitation Science, George Mason University. Fairfax, VA (11/16).
5. *Patellofemoral pain during running: A case for a proximal approach.* Annual meeting of the American Academy of Physical Medicine & Rehabilitation. New Orleans, LA (10/16).
6. *Retraining movement behavior for ACL injury prevention and rehabilitation: A matter of strength or motor control?* (Invited speaker). Annual meeting of the California Physical Therapy Association. Santa Clara, CA (10/16).
7. *Mechanisms Underlying patellofemoral joint dysfunction: Insights through musculoskeletal imaging* (Invited speaker). Radiological Sciences Seminar, University of California Irvine. Irvine, CA (10/16).
8. *Mechanisms of ACL injury: Implications for evidence based rehabilitation and return to sport decisions.* (Invited speaker). San Gabriel Valley District, California Physical Therapy Association. Duarte, CA (9/16).
9. *Mechanisms of ACL injury: Implications for evidence based rehabilitation and return to sport decisions.* (Invited speaker). Hoag Hospital Orthopaedic Grand Rounds, Irvine CA (5/16).
10. *Evaluation and treatment of movement dysfunction: A biomechanical approach* (Invited speaker). California Physical Therapy Fund Research Symposium. California Chapter American Physical Therapy Association. San Francisco, CA (12/15).
11. *Mechanisms Underlying Patellofemoral Joint Pain: What have we learned over the last 20 years?* (Invited speaker). 31st Annual Hawkeye Sports Medicine Symposium. Iowa City, IA (12/15).
12. *Mechanisms Underlying Patellofemoral Joint Pain: What have we learned over the last 20 years?* (Invited speaker). 25th Annual Mayo Clinic Symposium on Sports Medicine. Rochester, MN (11/15).
13. *Transforming Society by Optimizing Movement: An Achievable Vision for Physical Therapy?* (Invited Speaker). 2nd Annual Shirley Sahrman Lectureship. Program in Physical Therapy, Washington University, St. Louis, MO (10/15).
14. *Lower Extremity Pathomechanics: A Matter of Strength or Motor Control* (Keynote speaker). International Spine of Pain Institute. Minneapolis, MN (6/15).
15. *Rothstein Roundtable-“Putting all of our eggs in one basket: The human movement system”* (Invited speaker). NEXT Conference & Exposition, American Physical Therapy Association. National Harbor, MD (6/15).
16. *The Human Movement System: Physical therapist practice, education and research* (Invited speaker). NEXT Conference & Exposition, American Physical Therapy Association. National Harbor, MD (6/15).
17. *Mechanisms of ACL injury: Implications for evidence based rehabilitation and return to sport decisions.* (Keynote speaker). Current Concepts in Sports Medicine 2015, Fairview Sports Medicine. Minneapolis, MN (5/15).
18. *Mechanisms underlying patellofemoral joint pain: What have we learned over the last 20 years?* (Invited speaker). Department of Physical Therapy, University of Minnesota, Minneapolis, MN (4/15).

19. *Biomechanical factors underlying patellofemoral pain* (Invited Speaker). 7th World Congress of Biomechanics, Boston, MA (7/14).
20. *Mechanisms of ACL injury: Implications for evidence based rehabilitation and return to sport decisions.* (Invited speaker). Long Beach-South Bay District, California Physical Therapy Association. Torrance, CA (7/14).
21. *Return to sport testing following ACL injury: A biomechanical approach* (Keynote speaker). Sanford Sports Medicine Symposium, Sanford Medical Center, Sioux Falls, SD (5/14).
22. *Pathomechanics of the lower extremity: Proximal influences* (Invited speaker). Clinical Updates in Sports Medicine and Women's Health, Rehabilitation Institute of Chicago, Chicago, IL (5/14).
23. *Hip strategies for ACL injury prevention* (Invited speaker). XXIII International Conference on Sports Rehabilitation and Traumatology, Milan Italy (3/14).
24. *Mechanisms underlying patellofemoral joint pain: What have we learned over the last 20 years?* (Invited speaker). Rizzoli Orthopaedic Institute, Bologna, Italy (3/14).
25. *Mechanisms underlying patellofemoral joint pain: What have we learned over the last 20 years?* (Keynote speaker). Ostrow School of Dentistry Research Day, University of Southern California, Los Angeles, CA (3/14).
26. *Mechanisms underlying patellofemoral joint pain: What have we learned over the last 20 years?* (Invited speaker). Annual Movement Science Symposium. Department of Physical Therapy, Washington University, St. Louis, MO (3/14).
27. *Biomechanical Basis of Conservative Treatment for Patellofemoral Pain.* (Invited speaker). Department of Physical Therapy, University of Nevada, Las Vegas. Las Vegas, NV (11/13).
28. *Pathomechanics of running injuries* (Invited speaker). Science of Running Symposium. California Chapter American Physical Therapy Association. Los Angeles, CA (11/13).
29. *Biomechanical Risk Factors Related to ACL Injury: Implications for Return to Sport Decisions Post ACL-Reconstruction* (Invited speaker). Annual Meeting of the International Society of Arthroscopy, Knee Surgery and Orthopaedic Sports Medicine, Toronto, Canada (5/13).
30. *Proximal Factors Related to Knee Injury; Biomechanical Influences* (Invited speaker). Noraxon Research Symposium. Los Angeles, CA (4/13)
31. *Functional Biomechanics of the lower quarter: Implications for movement dysfunction and musculoskeletal injury* (Invited speaker). Annual Meeting of the Pennsylvania Chapter of the American Physical Therapy Association, Lancaster, PA (10/12)
32. *ACL injury mechanics & injury prevention training: implications for rehabilitation following ACL reconstruction* (Invited speaker). Orthopaedic Grand Rounds, Department of Orthopaedic Surgery, University of Southern California, Los Angeles, CA (6/12).
33. *Proximal factors contributing to running injuries* (Keynote speaker). Boston Sports Medicine Group. Northeastern University, Boston, MA (5/12).
34. *Biomechanical Basis of Conservative Treatment for Patellofemoral Pain.* (Invited speaker). Annual Meeting of the New Zealand Physiotherapy Association. Wellington, New Zealand (5/12).

35. *Biomechanical Basis of Conservative Treatment for Patellofemoral Pain*. (Invited speaker). Physical Medicine & Rehabilitation Grand Rounds, Johns Hopkins Medical Center, Baltimore, MD (4/12).
36. *Pathomechanics of lower extremity injury: A case for impaired proximal control* (Keynote speaker). Advancement in Physical Therapy Rehabilitation Symposium, Jeddah, Saudi Arabia (1/12).
37. *ACL injury mechanics & injury prevention training: implications for rehabilitation following ACL reconstruction* (Invited speaker). Major League Soccer Medical Symposium, Fort Lauderdale, FL (1/12).
38. *ACL injury mechanics & injury prevention training: implications for rehabilitation following ACL reconstruction* (Invited speaker). 2012 Baseball Medicine Conference, Phoenix, AZ (1/12).
39. *Lower extremity mechanics and patellofemoral joint dysfunction: A top down perspective* (Invited speaker). 2012 Baseball Medicine Conference, Phoenix, AZ (1/12).
40. *Patellofemoral pain: A critical review of evaluation and treatment techniques for physical therapists* (Invited speaker). Hip, Knee and Sports group Santa Casa de Sao Paulo, Sao Paulo, Brazil (12/11).
41. *Movement dysfunction and lower extremity injury: A top down perspective* (Invited speaker). Rendez-vous Physio 2011, Montreal, Canada (9/11).
42. *Mechanisms of Patellofemoral Pain: Lessons learned over the past 20 years* (Keynote speaker). International Patellofemoral Pain Retreat, Ghent, Belgium (8/11).
43. *Proximal factors contributing to running injuries* (Invited speaker). Tricounties District, California Physical Therapy Association. Santa Barbara, CA (5/11).
44. *Biomechanical factors underlying patellofemoral Pain: Implications for conservative care* (Invited speaker). Orthopaedic Grand Rounds, Department of Orthopaedic Surgery, University of Southern California, Los Angeles, CA (4/11).
45. *The dynamic Q-angle: Lower chain influences* (Invited speaker). Patellofemoral symposium sponsored by the Andrews Institute, Gulf Breeze, FL (11/10).
46. *Dynamic stabilization of the patellofemoral joint: Stabilization from above and below* (Invited speaker). Patellofemoral symposium sponsored by the Andrews Institute, Gulf Breeze, FL (11/10).
47. *Movement dysfunction and lower extremity injury: A top down perspective* (Invited speaker). Southwest Chapter, American College of Sports Medicine. San Diego, CA (10/10).
48. *ACL Injury and Prevention: An Evidence Based Model for Clinical Practice* (Invited speaker). Annual meeting of the California Chapter of the American Physical Therapy Association. Oakland, CA (10/10).
49. *Movement dysfunction and lower extremity injury: A top down perspective* (Invited speaker). Orange County District, California Physical Therapy Association. Orange, CA (9/10).
50. *Patellofemoral pain: A critical review of evaluation and treatment techniques for physical therapists* (Invited Speaker). Annual meeting of the Thai Physiotherapy Association, Bangkok, Thailand (4/10).
51. *The influence of proximal weakness on patellofemoral joint dysfunction* (Keynote speaker). Emirates Physiotherapy Conference. Dubai, United Arab Emirates (4/10).

52. *Biomechanical and neuromuscular risk factors associated with ACL injury: Implications for prevention.* (Keynote speaker). Emirates Physiotherapy Conference. Dubai, United Arab Emirates (4/10).
53. *Mechanisms underlying ACL injury prevention training: The brain-behavior relationship* (Keynote speaker). ACL Research Retreat V. Greensboro, NC (3/10).
54. *Movement dysfunction and lower extremity injury: A top down perspective* (Invited speaker). Department of Family Medicine/Sports Medicine, Kaiser Permanente, Los Angeles, CA (3/10).
55. *Movement dysfunction and lower extremity injury: A top down perspective* (Invited Speaker). Physical Therapy: A World of Knowledge. Macabe Healthcare System. Tel-Aviv, Israel (1/10).
56. *Rehabilitation of the sporting knee: Biomechanical considerations* (Keynote speaker). Annual meeting of the Australian Physiotherapy Association, Sydney Australia (10/09).
57. *Proximal contributions to patellofemoral pain* (Keynote speaker). Annual meeting of the Australian Physiotherapy Association, Sydney, Australia (10/09).
58. *Proximal weakness and lower extremity injuries: A biomechanical perspective* (Invited speaker). Akron Children's Hospital, Akron, OH (9/09).
59. *Proximal weakness and lower extremity injuries: A biomechanical perspective* (Invited speaker). Tri-City Wellness Sports Medicine Symposium, Tri-City Medical Center Carlsbad, CA (6/09)
60. *The influence of lower extremity mechanics on patellofemoral joint dysfunction: A top down perspective* (Invited speaker). Annual meeting of the Canadian Physiotherapy Association, Calgary, Alberta, Canada (5/09).
61. *Bridging the gap between biomechanics and ACL injury prevention* (Invited speaker). Annual meeting of the Canadian Physiotherapy Association, Calgary, Alberta, Canada (5/09).
62. *Proximal weakness and lower extremity injuries: A biomechanical perspective* (Keynote speaker). Sanford Sports Medicine Symposium, Sanford Medical Center, Sioux Falls, SD (5/09).
63. *Lower extremity Rehabilitation: A top down perspective* (Keynote speaker). Sanford Sports Medicine Symposium, Sanford Medical Center, Sioux Falls, SD (5/09).
64. *Mechanisms of patellofemoral joint dysfunction: What have we learned over the last 15 years* (Invited speaker). Department of Biomedical Engineering, University of Southern California, Los Angeles, CA (4/09).
65. *The Influence of lower extremity mechanics on knee injury: Implications for rehabilitation and prevention* (Keynote speaker). 3rd Annual Current Concepts in Sports Medicine. Hospital for Special Surgery, New York, NY (4/09).
66. *Biomechanical factors contributing to overuse injuries of the lower quarter: A top down perspective* (Keynote speaker). 6th Annual Running Medicine Conference, Department of Physical Medicine & Rehabilitation, University of Virginia, Charlottesville, VA (4/09).
67. *The Influence of lower extremity mechanics on knee injury: Implications for rehabilitation and prevention* (Invited speaker). Department of Family Medicine/Sports Medicine, Kaiser Permanente, Los Angeles, CA (3/09).

68. *Current perspectives on mobilization and spine mechanics* (Invited speaker). Israeli Physiotherapy Society. Tel-Aviv, Israel (1/09).
69. *Overuse Injuries of the knee: Pathomechanics & Evaluation* (Keynote speaker). The 25th International Jerusalem symposium on Sports Medicine. Jerusalem, Israel (1/09).
70. *Pathomechanics of the lower extremity: A top down perspective* (Keynote speaker). The 25th International Jerusalem symposium on Sports Medicine. Jerusalem, Israel (1/09).
71. *The influence of proximal weakness on lower extremity mechanics: Implications for knee injury* (Invited speaker). Department of Sport Rehabilitation, Beijing Sports University. Beijing, China (11/08).
72. *Pathomechanics of the lower extremity: A top down perspective* (Keynote speaker) Aurora Sports Medicine Symposium. Milwaukee WI (10/08).
73. *Pathomechanics of the patellofemoral joint: A top down perspective* (Keynote speaker) Aurora Sports Medicine Symposium. Milwaukee WI (10/08).
74. *The influence of lower extremity mechanics on ACL injury: A top down perspective* (Keynote speaker) Aurora Sports Medicine Symposium. Milwaukee WI (10/08).
75. *Intervention and injury prevention strategies: A top down approach* (Keynote speaker) Aurora Sports Medicine Symposium. Milwaukee WI (10/08).
76. *Mechanisms of patellofemoral joint dysfunction: What have we learned over the last 15 years* (Invited speaker). Department of Physical Therapy & Human Movement Science. Northwestern University, Chicago, IL (10/08).
77. *Pathomechanics of the patellofemoral joint: A top down perspective* (Invited speaker). Drayer Physical Therapy Institute's National Conference. Hilton Head, NC (10/08).
78. *Lower quarter rehabilitation: A top down perspective* (Invited speaker). Drayer Physical Therapy Institute's National Conference. Hilton Head, NC (10/08).
79. *Mechanisms of patellofemoral joint dysfunction: What have we learned over the last 15 years* (Invited speaker). Department of Kinesiology, University of Michigan. Ann Arbor, MI (9/08).
80. *The influence of lower extremity mechanics on knee injury: Implications for the female athlete* (Keynote speaker). Central California Sports Medicine Institute, California State University Fresno, Fresno, CA (9/08).
81. *Intervention and injury prevention strategies for the female athlete* (Keynote speaker). Central California Sports Medicine Institute, California State University Fresno, Fresno, CA (9/08).
82. *The influence of lower extremity mechanics on knee injury: Implications for prevention and rehabilitation* (Invited speaker). Orthopaedic Grand Rounds, Department of Orthopaedic Surgery, University of California San Diego, San Diego, CA (7/08).
83. *Non-contact ACL injuries: Relevant biomechanics & prevention strategies* (Keynote speaker). Sanford Sports Medicine Symposium, Sanford Medical Center, Sioux Falls, SD (5/08).
84. *Current trends in the treatment and prevention of lower extremity injuries: The hip-knee connection* (Invited speaker). Department of Physical Therapy, Cleveland Clinic, Cleveland OH (2/08).

85. *Current trends in the treatment and prevention of lower extremity injuries: The hip-knee connection* (Invited speaker). Department of Family Medicine/Sports Medicine, Kaiser Permanente, Los Angeles, CA (1/08).
86. *Current trends in the treatment and prevention of lower extremity injuries: The hip-knee connection* (Invited speaker) Inland Counties District of the California Chapter, American Physical Therapy Association, Loma Linda, CA (11/07).
87. *ACL injury prevention programs: What is important? Why do they work?* (Invited speaker) Drayer Physical Therapy Institute's National Conference. Hilton Head, NC (10/07).
88. *Pathomechanics of the patellofemoral joint: Implications for treatment* (Invited speaker). Drayer Physical Therapy Institute's National Conference. Hilton Head, NC (10/07).
89. *ACL injury prevention programs: What is important? Why do they work?* (Invited speaker) Annual meeting of the California Physical Therapy Association. Los Angeles, CA (9/07)
90. *Current trends in the treatment and prevention of lower extremity injuries: The hip-knee connection* (Invited speaker) Department of Physical Therapy, Bunkyo-Gaukin University, Tokyo, Japan (9/07).
91. *Current concepts on patellofemoral joint mechanics and intervention strategies* (Invited speaker). Annual Meeting of the National Athletic Trainers Association. Anaheim, CA (6/06).
92. *Essentials of gait analysis for orthopaedic conditions* (Invited speaker). Annual Meeting of the National Athletic Trainers Association. Anaheim, CA (6/06).
93. *The contribution of abnormal hip mechanics to knee injury: A top down perspective.* (Invited speaker). Orthopaedic Grand Rounds, Department of Orthopaedic Surgery, University of Southern California, Los Angeles, CA (3/07).
94. *ACL injury prevention: An evidence based model for clinical practice* (Invited speaker). Combined Sections Meeting of the American Physical Therapy Association. Boston, MA (2/07).
95. *Current trends in patellofemoral joint rehabilitation: A scientific approach* (Invited speaker). 16th Annual Mayo Clinic Symposium on Sports Medicine. Rochester, MN (11/06).
96. *Current trends in patellofemoral joint rehabilitation* (Invited speaker). Annual meeting of the American Academy of Orthopaedic Manual Therapists. Charlotte, NC (10/06).
97. *Beyond clinical prediction rules: The role of mechanistic research in guiding rehabilitation and injury prevention programs* (Invited speaker). Annual meeting of the American Academy of Orthopaedic Manual Therapists. Charlotte, NC. (10/06).
98. *Functional rehabilitation of the lower extremity* (Invited speaker). Drayer Physical Therapy Institute's National Conference. Hilton Head, NC (10/06).
99. *Disorders of the patellofemoral joint* (Invited speaker). Drayer Physical Therapy Institute's National Conference. Hilton Head, NC (10/06).
100. *Biomechanics of the patellofemoral joint* (Invited speaker). International Society of Arthroscopy, Knee Surgery and Orthopaedic Sports Medicine. Stellenbosch, South Africa (10/06).

101. *Evaluation of joint function using kinematic magnetic resonance imaging: Research and clinical applications (Invited speaker)*. Annual meeting of the American Society of Biomechanics. Blacksburg, VA (9/06)
102. *ACL injury prevention programs: Why do they work? (Invited speaker)*. Annual Meeting of the National Athletic Trainers Association. Atlanta, GA (6/06).
103. *Pathomechanics of patellofemoral joint dysfunction (Invited speaker)*. Annual Meeting of the National Athletic Trainers Association. Atlanta, GA (6/06).
104. *Biomechanics of non-contact ACL injuries: The gender bias (Invited speaker)*. 9th Annual Lake Tahoe Knee & Shoulder Update, University of Nevada & Lake Tahoe Orthopaedic Institute, Lake Tahoe, CA (4/06).
105. *Rehabilitation of Patellofemoral Joint Disorders (Invited speaker)*. 9th Annual Lake Tahoe Knee & Shoulder Update, University of Nevada & Lake Tahoe Orthopaedic Institute, Lake Tahoe, CA (4/06).
106. *Pathomechanics of patellofemoral joint dysfunction (Invited speaker)*. Annual Meeting of the Medical College of Wisconsin Sports Medicine Symposium. Milwaukee, WI (3/06).
107. *An overview of the patellofemoral joint for the orthopaedic surgeon (Invited speaker)*. Orthopaedic Grand Rounds, Department of Orthopaedic Surgery, University of Southern California, Los Angeles, CA (2/06).
108. *Using research to promote your practice: Marketing evidence based interventions (Invited speaker)* Annual Meeting of the APTA, Orlando, FL (6/06).
109. *Using research to promote your practice: Marketing evidence based interventions (Invited speaker)* Combined Sections Meeting of the APTA, San Diego, CA (2/06).
110. *Bracing for patellofemoral joint dysfunction: Current concepts and research. (Invited speaker)* Combined Sections Meeting of the American Physical Therapy Association, San Diego, CA (2/06).
111. *Abnormal lower extremity mechanics: Implications for the treatment and prevention of knee injuries (Invited speaker)*. Annual meeting of the Nevada Physical Therapy Association, Las Vegas, NV (11/05).
112. *Using research to promote your practice: Marketing evidence based interventions (Invited speaker)* Annual meeting of the Colorado Physical Therapy Association, Denver, CO (11/05).
113. *Biomechanics of the lower extremity (Invited speaker)*. Annual meeting of the Wisconsin Physical Therapy Association, Stevens Point, WI (11/05).
114. *The role of abnormal lower extremity motions in contributing to patellofemoral dysfunction: Implications for rehabilitation (Keynote speaker)*. Congresso Brasileiro de Fisioterapia, Sao Paulo, Brazil (10/05).
115. *Abnormal lower extremity mechanics: Implications for the treatment and prevention of knee injuries (Invited speaker)*. Annual meeting of the California Physical Therapy Association, Ontario, CA (10/05).
116. *Biomechanical considerations in patellofemoral joint rehabilitation (Invited speaker)* Casa Colina Hospital, Department of Physical Rehabilitation, Pomona, CA (9/05)
117. *Biomechanical considerations in patellofemoral joint rehabilitation (Invited speaker)*. University of Central Arkansas, Department of Physical Therapy, Conway, AR (9/05)

118. *Abnormal lower extremity mechanics: Implications for the treatment and prevention of knee injuries* (Invited speaker). Annual meeting of the *International Patellofemoral Joint Study Group*, Laussane, Switzerland (4/05).
119. *Essentials of gait: Understanding mechanics for the treatment of the lower extremity* (Invited speaker). Sport and Spine rehabilitation symposium. Rehabilitation Institute of Chicago. Chicago, IL (4/05).
120. *Abnormal lower extremity mechanics: Implications for the treatment and prevention of knee injuries* (Invited speaker). 8th Annual Lake Tahoe Knee & Shoulder Update, Lake Tahoe Orthopaedic Institute, Lake Tahoe, CA (4/05).
121. Current trends in patellofemoral joint rehabilitation (Invited speaker). 8th Annual Lake Tahoe Knee & Shoulder Update, Lake Tahoe Orthopaedic Institute, Lake Tahoe, CA (4/05).
122. *Pathomechanics of patellofemoral pain syndrome* (Invited speaker). University of Washington Musculoskeletal and Sports Medicine Symposium. University of Washington School of Medicine. Seattle, WA (4/05).
123. *Current trends in patellofemoral joint rehabilitation: An evidenced based approach* (Invited speaker). University of Washington Musculoskeletal and Sports Medicine Symposium. University of Washington School of Medicine. Seattle, WA (4/05).
124. *Current trends in patellofemoral joint rehabilitation* (Invited speaker). Department of Physical Therapy, Tel-Aviv University, Tel-Aviv, Israel (3/05).
125. *Insight into lumbar spine's segmental mobility and manual assessment using dynamic MRI* (Invited speaker). Department of Experimental Anatomy, Vrije University of Brussels. Brussels, Belgium (3/05).
126. *Abnormal lower extremity mechanics in female athletes: Implications for the treatment and prevention of knee injuries* (Invited speaker). Long Beach/South Bay District of the California Chapter, American Physical Therapy Association, Long Beach, CA (3/05).
127. Biomechanical considerations in patellofemoral joint rehabilitation (Invited speaker). Orthopaedic Grand Rounds, Department of Orthopaedic Surgery, University of Southern California, Los Angeles, CA (2/05).
128. *Do ACL injury prevention programs influence performance?* Hunt Valley II ACL Consensus Conference. American Orthopaedic Society for Sports Medicine. Atlanta, GA (2/05).
129. *Using research to promote your practice: Marketing evidence based interventions* (Invited speaker) Annual meeting of the Private Practice Section APTA, Colorado Springs, CO (11/04).
130. *Mechanisms of knee injury: Implications for prevention and rehabilitation* (Invited speaker). Annual meeting of the New York Physical Therapy Association, Long Island, NY (10/04).
131. *Mechanisms of knee injury: Implications for prevention and rehabilitation* (Invited speaker). Annual meeting of the Ohio Physical Therapy Association, Columbus, OH (10/04).
132. *Pathomechanics of patellofemoral pain* (Invited speaker). San Jose District of the California Chapter, American Physical Therapy Association, San Jose, CA (10/04).
133. *Mechanisms of knee injury: Implications for prevention and rehabilitation* (Invited speaker). Mike Hage Memorial Lecture, Rehabilitation Institute of Chicago, Chicago, IL (6/04).

134. *Abnormal lower extremity mechanics in female athletes: Implications for the treatment and prevention of knee injuries* (Invited speaker). Orthopaedic Grand Rounds, Department of Orthopaedic Surgery, University of Southern California, Los Angeles, CA (5/04).
135. *Abnormal lower extremity mechanics in female athletes: Implications for the treatment and prevention of knee injuries* (Invited speaker). International Federation of Sports Physiotherapists. Maastricht, Holland (12/03).
136. *Current trends in patellofemoral joint rehabilitation* (Invited speaker). California Physical Therapy Association. Sacramento, CA (11/03).
137. *Managing in the world of evidence based practice: Is it possible?* (Keynote speaker) Annual meeting of the Nebraska Physical Therapy Association. Lincoln, NE (9/03).
138. *Understanding the challenges and opportunities for private practice: What will evidence based practice change for you?* (Invited speaker) 14th International meeting of the World Confederation for Physical Therapy. Barcelona, Spain (6/03).
139. *Current trends in patellofemoral joint rehabilitation* (Invited speaker). California Society of Physical Medicine and Rehabilitation. San Diego CA (6/03).
140. *Developing treatment strategies for persons with patellofemoral pain: A biomechanical approach* (Keynote speaker). Southern California Conference on Biomechanics. Pepperdine University, Malibu, CA. (3/03).
141. *Developing treatment strategies in persons with patellofemoral pain: A mechanistic approach* (Invited speaker) Eugene Michels Forum, Combined Sections Meeting of the American Physical Therapy Association (2/03).
142. *Current concepts in patellofemoral joint rehabilitation* (Invited speaker). 2003 Kaiser Permanente Daniel Dale Orthopaedic Symposium, Anaheim, CA (1/03).
143. *Rehabilitation of the patellofemoral joint disorders* (Invited speaker). 7th Annual Lake Tahoe Knee & Shoulder Update, Duke University School of Medicine & Lake Tahoe Orthopaedic Institute, Lake Tahoe, CA (12/02).
144. *Normal and pathological gait* (Invited speaker). Medica 2002 International Congress, Düsseldorf, Germany (11/02).
145. *The role of abnormal lower extremity mechanics in patellofemoral joint dysfunction: Implications for the treatment and prevention of patellofemoral pain* (Keynote speaker). European Congress for the Prevention of Disease Through Physiotherapy. Association of Austrian Physiotherapists. Vienna, Austria. (11/02).
146. *Pathomechanics of patellofemoral pain* (Invited speaker). Long Beach/South Bay District of the California Chapter, American Physical Therapy Association, Torrance, CA (9/02).
147. *Biomechanical modeling of the patellofemoral joint* (Invited speaker). Department of Biomechanics and Movement Science, University of Delaware, Wilmington, DE. (9/02).
148. *Conservative treatment of patellofemoral pain: A paradigm shift* (Invited speaker). Orthopaedic Grand Rounds, Department of Orthopaedic Surgery, University of Southern California, Los Angeles, CA (6/02).
149. *Putting evidence into practice: Overcoming the barriers* (Invited speaker). Madonna Rehabilitation Hospital, Lincoln, NE (3/02).

150. *Normal and Pathological Gait* (Invited speaker). Medica 2001 International Congress, Düsseldorf, Germany (11/01).
151. *Rehabilitation of the patellofemoral joint: Exercise treatment for the patient with patellofemoral pain* (Invited speaker). 6th Annual Lake Tahoe Knee & Shoulder Update, Duke University School of Medicine & Lake Tahoe Orthopaedic Institute, Lake Tahoe, CA (12/01).
152. *Kinematic and kinetic analysis of sidestep cutting: A comparison of males and females.* (Invited speaker). Annual Resident Research Symposium, Department of Orthopaedic Surgery, University of California at Irvine, Irvine, CA (6/01).
153. *Mechanical determinants of patellofemoral stress: Evaluation using an imaging based biomechanical model* (Invited speaker). Dept. Kinesiology, California State University, Los Angeles, CA (5/01).
154. *“Hooked on Evidence”*: *An overview of the systematic collection of outcomes research related to physical therapist practice* (Invited speaker). World Congress of Physical Therapy, Evidence Based Medicine Symposium, London England, (11/01).
155. *Hooked on Evidence”*: *An overview of the systematic collection of outcomes research related to physical therapist practice* (Invited speaker). Annual Meeting of the California Chapter, APTA, Santa Clara, CA (10/01).
156. *Hooked on Evidence”*: *An overview of the systematic collection of outcomes research related to physical therapist practice* (Invited speaker). Annual Meeting of the American Physical Therapy Association, Anaheim, CA (6/01).
157. *Hooked on Evidence”*: *An overview of the systematic collection of outcomes research related to physical therapist practice* (Invited speaker). Tri-counties District of the California Chapter, APTA, Santa Barbara, CA (3/01).
158. *Rehabilitation of the patellofemoral joint: Relevant Biomechanics* (Invited speaker). 5th Annual Lake Tahoe Knee & Shoulder Update, Duke University School of Medicine & Lake Tahoe Orthopaedic Institute, Lake Tahoe, CA (12/00).
159. *Infusing Scientific Evidence into Physical Therapy Clinical Practice* (Invited speaker). Greater Los Angeles District of the California Chapter, American Physical Therapy Association, Downey, CA (11/00).
160. *Current Controversies in Patellofemoral Joint Rehabilitation.* (Invited speaker). Orange County District of the California Chapter, American Physical Therapy Association, Irvine, CA (10/00).
161. *Exercise and rehabilitation approaches to reduce fall risk factors* (Invited speaker). Annual symposium sponsored by the Geriatric Research Education and Clinical Center, Sepulveda VA Medical Center, Marina del Rey, CA. (9/00).
162. *Factors contributing to patellofemoral stress in individuals with patellofemoral pain: Evaluation using an in-vivo biomechanical model* (Invited speaker). Annual Resident Research Symposium, Department of Orthopaedic Surgery, University of California at Irvine, Irvine, CA (6/00).
163. *Patellofemoral Pain Syndrome: Evidenced-based physical therapy* (Keynote speaker). Marge Barre Symposium, University of Texas-Southwestern, Dallas, TX. (3/00).

164. *Current update in patellofemoral joint research* (Invited speaker). National Yang Ming University, Taipei, Taiwan (12/99).
165. *Patients, case reports and clinical communication* (Invited speaker). California Chapter American Physical Therapy Association, Palm Springs, CA. (10/99).
166. *Patellofemoral joint biomechanics: Implications for the orthopaedic surgeon* (Invited speaker). Orthopaedic Grand Rounds, Department of Orthopaedic Surgery, University of Southern California, Los Angeles, CA (6/99).
167. *How to get involved in clinical research* (Invited speaker). Tri-counties District of the California Chapter, American Physical Therapy Association, Santa Barbara, CA (3/99).
168. *Current topics in patellofemoral joint research* (Invited speaker). Inland Empire District of the California Chapter, American Physical Therapy Association, Loma Linda, CA (3/98).
169. *Below-knee amputee gait: Recent research and implications for clinical practice* (Invited speaker) Annual Gait Conference. UCLA Department of Physical Medicine and Rehabilitation, Los Angeles, CA (5/97).
170. *Considerations for loading of the extensor mechanism in the assessment of patellofemoral joint mechanics* (Invited speaker) Orthopaedic Bioengineering Symposium, Long Beach, CA (11/95).

III. ACADEMIC, ADMINISTRATIVE & SERVICE ACTIVITIES

Administrative Appointments

- 7/03-present *Director, Program in Biokinesiology*
 Division of Biokinesiology & Physical Therapy
 University of Southern California, Los Angeles, CA.
- 7/97-present *Co-Director Musculoskeletal Biomechanics Research Laboratory*
 Division of Biokinesiology & Physical Therapy,
 University of Southern California, Los Angeles, CA.
- 7/99-6/03 *Director, Doctor of Physical Therapy Program,*
 Department of Biokinesiology & Physical Therapy
 University of Southern California, Los Angeles, CA.

Courses Developed & Taught

- PT 599 Fundamentals of Movement Analysis (2 units)
 Division of Biokinesiology & Physical Therapy, University of Southern California.
- PT 599 Applied Movement Analysis (2 units)
 Division of Biokinesiology & Physical Therapy, University of Southern California.
- PT 582 Mechanics of Human Gait (2 units)
 Division of Biokinesiology & Physical Therapy, University of Southern California.
- PT 574 Clinical Biomechanics (3 units)
 Division of Biokinesiology & Physical Therapy, University of Southern California.
- BKN 563 Biomechanics of Human Motion (3 units)
 Division of Biokinesiology & Physical Therapy, University of Southern California.

BKN 575 Principles Musculoskeletal Imaging (2 units)
Division of Biokinesiology & Physical Therapy, University of Southern California.

Student Mentoring

Post-Doctoral Fellows

Gretchen Salsich (2001)
Christine Pollard (2005)
Yiu-Ming Wong (2010)
Thiago Fukuda (2013)
Seol Park (Current)

Research Fellows

Susumu Ota (2003)
Chatchada Chinkulprasert (2010)
Theresa Nakagawa (2012)
Yunfeng Han (2013)
Li Yin (2015)
Roberta Brunelli (2016)
Alex Horgan (Current)
Francesco Della Villa (Current)

PhD students

Jacki Heino-Brechter (2000)
Kathleen Ganley (2003)
Judith Burnfield (2003)
Samuel Ward (2003)
Susan Sigward (2004)
Yi-Ju Tsai (2007)
Richard Souza (2008)
Yu-Jen Chen (2008)
Shawn Farrokhi (2009)
Liang-Ching Tsai (2011)
Mark Lyle (2012)
Kristen Stearns (2012)
Szu-Ping Lee (2012)
Kai-Yu Ho (2012)
Mark Blanchette (2013)
Hsiang-Ling Teng (2013)
Jennifer Bagwell (2015)
Tzu-Chieh Liao (2017)
Yo-Shih (Current)
Jonathon Lee (Current)
Jia Liu (Current)
Kyungmi Park (Current)
Jordan Cannon (Current)
Rachel Straub (Current)

Masters Students

Steve Reischl (1997)
Gary Souza (1998)
Dan Farwell (1999)

Wendy Burke (1999)
Pon-Yo Chen (2000)
Lider Chan (2000)
Maria Stefanou (2006)
Mark Blanchette (2007)
Diana Pinto (2007)
Alicia Foster (2010)
Yi-Chen Chou (2010)
Scott Bogdanoff (2011)
Anna Southam (2013)
Rachel Straub (2013)
Chun-Hao Huang (2016)
Adam Barrack (Current)

University Service

Division of Biokinesiology & Physical Therapy

Director Doctor of Physical Therapy program (1993-2003)
Curriculum committee (2015)
Faculty Affairs committee (2015-2016)
Director program in Biokinesiology (2004-present)
Executive committee (2010-present)

School of Dentistry

Appointments & promotions committee (2016-present)

Activities in Professional Organizations

American Physical Therapy Association

Section on Research:

President (2008-2012)
President-elect (2007-2008)
Vice-President (2000-2006)
By-laws Chair (2006-2007)
Delegate to House of Delegates (2000-2001)

Orthopaedic Section:

Grant Reviewer (1999-2002)
Education Committee (1998-2008)
Research Agenda Task Force (2008-present)
Advisory Panel on Research (1999-2001)
Task group for Basic Science Research (2004-2006)
Movement System Board Work Group (2013-2015)
Annual Conference Programming: Orthopaedic subcommittee (2001-2003)
Media Spokesperson (2009-2012)
Legislative Key Contact (2012-present)

California Chapter American Physical Therapy Association

President (2014-present)
Vice President (2003-2007)
Speaker of the Assembly (2003-2007)
Board of Directors (2002-2003)
Delegate to APTA House of Delegates (2002-present)
Committees
Practice and Quality Service Committee (1999-2001)
Communications Committee (2002-2005)

Education Committee (2006-2007)
Reference Committee (2008-2011)
Task forces
Term of office (2006)
Education plan (2008)
Expert Resource Panel (1999-present)
Legislative Key Contact (2005-2012)
Research Special Interest Group
Director (1997)
Chair (1998-2001)

California Physical Therapy Fund
President (2011-2013)
Board member (2014-present)

Foundation for Physical Therapy
Scientific Review Committee (2005-2007)
Scientific Advisory Committee (2008-2012)

Gait and Clinical Movement Analysis Society
Program committee (2004-2005)

Kaiser Residency Program in Orthopaedic Physical Therapy
Faculty (2000-present).

National Institutes of Health
Special Emphasis Panel Grant Reviewer-NIAMS (2012)
Early Independence Grant Reviewer-NIAMS (2014)
Grant Reviewer: NIAMS-AMSC conflict review panel (2015-2016)
Mechanistic Ancillary Studies Review Panel-NIAMS (2017)

National Youth Sports Health and Safety Institute
Leadership board (2012-2017)

World Confederation of Physical Therapy
Evidence Based Practice Advisory Panel (2002-2006)
Congress Abstract Review Panel (2006-2007)
Congress Focused Symposium Review Panel (2009-2010)

External Promotion and/or Tenure Reviewer

University of the Pacific, 2017
University of Wyoming, 2016
Pennsylvania State University, 2016
University of Denver, 2015
Boston University, 2015
University of Florida, 2015
Auburn University, 2015
Temple University, 2014
University of Minnesota, 2014
New York University, 2013
University of Virginia, 2013
University of Michigan, 2013
University of British Columbia, 2013

Western University of Health Sciences, 2013
Washington University, 2012
University of North Florida, 2012
Hong Kong Polytechnic University, 2012
University of Pittsburg, 2012
Brigham Young University, 2012
Washington University, 2011
Northwestern University, 2011
University of Iowa, 2010
University of North Carolina, Chapel Hill, 2010
University of Michigan, 2009
Ohio State University, 2009
Case Western University, 2009
University of Wisconsin, Madison, 2008
University of Utah, 2005
Ithaca College, 2004

Journal Editorial Boards

Foot & Ankle International

Associate Editor: 2004-2006

Journal of Applied Biomechanics

Associate Editor: 2002-2011

Journal of Athletic Training

Editorial Board Member: 2004-2014

Journal of Orthopaedic and Sports Physical Therapy

Editorial Board Member: 1997-1998

Associate Editor: 1998-2010

Editor 2011-present

Physical Therapy

Associate Editor: 2002-2008