Exponent®
Engineering & Scientific Consulting

Scott McLean, Ph.D.

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Professional Profile

Dr. McLean's areas of expertise include injury biomechanics, gait and locomotion and human performance assessment and modification, publishing extensively in each of these fields. He has more than two decades of experience in analyzing and countering injury mechanisms via a combination of human experimentation, cadaveric and computational modeling approaches.

In particular, Dr. McLean has targeted joint and soft tissue injuries and resultant disease risk in response to dynamic high impact loading scenarios. His related research foci include sports-specific joint injury mechanisms and prevention, high-impact soft tissue mechanical analyses and lower limb anatomical and neuromechanical adaptations to loads across the lifespan. Through this work, he has obtained extensive expertise in utilizing state-of-the-art 3-D motion analysis techniques, wearable inertial sensor technologies and integrated 3-D imaging and computational (Finite Element) modeling methods.

Dr. McLean also has considerable expertise in applying state-of-the-art wearable technologies to the optimization of human movement and performance within a variety of clinical, sporting and military settings. His strengths in this area lie specifically in the ability to interpret and distil the often large and unique data sets derived from these technologies into easily understood baseline metrics that successfully characterize and can be used to improve key performance outcomes.

Prior to joining Exponent, Dr. McLean was the Director of Human Innovation Research at Fitbit, where he derived and lead a number of key research initiatives focusing on characterization and improvement of wearable product accuracies and performance on a global scale. He was also a Professor at the University of Michigan, where he drove a number of high-profile research studies geared towards human performance optimization and injury assessment and prevention within naturalistic military and sports environments. During his tenure at Michigan, Dr. McLean gained considerable teaching experience in the areas of biomechanics, imaging and computational analysis and modeling, both at the undergraduate and graduate levels. He initially was a Project Staff Scientist and the Director of Sports Health and Orthopedic Rehabilitation at the Cleveland Clinic, where he was the team biomechanical consultant for Cleveland’s professional sporting teams.

Academic Credentials & Professional Honors

Ph.D., Human Movement Studies, University of Queensland, Australia, 2001

M.Sc., Human Movement Studies, University of Queensland, Australia, 1994

B.Sc., Human Movement Studies, University of Queensland, Australia, 1991

Post-Doctoral Research Fellow, Bioengineering, Cleveland Clinic Foundation, 2001

Chair, American College of Sports Medicine, Biomechanics, 2011

Executive Council, International Society of Biomechanics, 2011-2015

Academic Appointments

Adjust Professor, School of Health and Life Sciences, University of Ballarat (Federation University), 2005-2006.

Prior Experience

Director, Human Innovation Research, Fitbit, 2016-2018

Director, Human Performance and Innovation Laboratory, University of Michigan, 2007-2015

Professor, School of Kinesiology, University of Michigan, 2007-2015

Director, Sports Health and Orhopaedic Rehabilitation, Cleveland Clinic, 2005-2006

Staff Scientist, Department of Biomedical Engineering, Cleveland Clinic, 2001-2006

Professional Affiliations

National Consumer Technology Association (voting member)

American Society of Biomechanics (member)

American College of Sports Medicine (fellow)

International Society of Biomechanics (member)

Publications

Fox AS, Bonacci J, McLean SG, Saunders N. Exploring individual adaptations to an anterior cruciate ligament injury prevention program. Knee 2017; 25:83-98.

Fox AS, Bonacci J, McLean SG, Saunders N. Efficacy of ACL injury risk screening methods in identifying high-risk landing patterns during a sport-specific task. Scandinavian Journal of Medicine and Science in Sports 2017; 27:525-534.

McGinnis RS, Cain SM, Davidson SP, Vitali RR, McLean SG, Perkins NC. Inertial sensor and cluster analysis for discriminating agility run technique and quantifying changes across load. Biomed Signal Process Control 2017; 32:150-156.

McGinnis RS, Cain SM, Davidson SP, Vitali RR, Perkins NC, McLean SG. Quantifying the effects of load carriage and fatigue under load on sacral kinematics during countermovement jump with IMU-based method. Sports Engineering 2016; 19:21-34.

Davidson SP, Cain SM, McGinnis RS, Vitali RR, Perkins NC, McLean SG. Quantifying warfighter performance in a target acquisition and aiming task using wireless inertial sensors. Applied Ergonomics 2016 56:27-33.

Cain SM, McGinnis RS, Davidson SP, Vitali RV, Perkins NC, McLean SG. Quantifying performance and effects of load carriage during a challenging balancing task using an array of wireless inertial sensors. Gait and Posture 2016 43:65-69.

Fox AS, Bonacci J, McLean SG, Spittle M, Saunders N. A systematic evaluation of field-based screening methods for the assessment of anterior cruciate ligament (ACL) injury risk. Sports Medicine 2016 46:715-735.

Davidson SP, McLean SG. Effects of maturation on combined female muscle strength and ACL structural factors. Journal of Science and Medicine in Sport 2016 19:553-558.

Whiteside D, Deneweth JM, Pohorence MA, Sandoval B, Russell JR, McLean SG, Zernicke RF, Goulet GC. Grading the functional movement screen: A comparison of manual (real-time) and objective methods. Journal of Strength and Conditioning Research 2016 30:924-933.

Thomas AC, Lepley LK, Wojtys EM, McLean SG, Palmieri-Smith RM. Effects of neuromuscular fatigue on quadriceps strength and activation and knee biomechanics in individuals post-anterior cruciate ligament reconstruction and healthy adults. Journal of Orthopaedic Sports Physical Therapy 2015 45:1042-1050.

McLean SG, Mallett KF, Arruda EM. Deconstructing the anterior cruiciate ligament: what we don't know about function, material properties and injury mechanics. Journal of Biomechanical Engineering 2015 137:1519-1537.

Deneweth JM, Pomeroy SM, Russell JR, McLean SG, Zernicke RF, Bedi A, Goulet GC. Position-specific hip and knee kinematics in NCAA football athletes. Orthopaedic Journal of Sports Medicine 2014 2:1-10.

Brown TN, Palmieri-Smith RM, McLean SG. Comparative adaptations of lower limb biomechanics during unilateral and bilateral landings after different neuromuscular-based ACL injury prevention protocols. Journal of Strength and Conditioning Research 2014 28:2859-2871.

Fox AS, Bonacci J, McLean SG, Spittle M, Saunders N. What is normal? Female lower limb kinematic profiles during athletic tasks used to examine anterior cruciate ligament injury risk: a systematic review. Sports Medicine 2014 44:815-832.

Saunders N, McLean SG, Fox AS, Otago L. Neuromuscular dysfunction that may predict ACL injury risk: a case report. Knee 2014 21:789-792.

Kristianslund E, Krosshaug T, Mok KM, McLean SG, van den Bogert AJ. Expressing joint moments of drop jumps and sidestep cutting in different reference frames – does it matter? Journal of Biomechanics 2014 47:193-199.

Brown TN, McLean SG, Palmieri-Smith RM. Associations between lower limb muscle activation strategies and resultant multi-planar knee kinetics during single leg landings. Science and Medicine in Sport 2014 17:408-413.

Deneweth JM, Arruda EM, McLean SG. Evaluation of hyperelastic models for the non-linear and non-uniform high strain rate mechanics of tibial cartilage. Journal of Biomechanics 2013 46:1604-1610.

Kipp K, Brown TN, McLean SG, Palmieri-Smith RM. Decision-Making and Experience Level Influence Frontal Plane Knee Joint Biomechanics During a Cutting Maneuver. Journal Applied Biomechanics 2013 29:756-762.

Leply LK, Thomas AC, McLean SG, Palmieri-Smith RM. Fatigues lack-of-effect on thigh muscle activity in ACL reconstructed patients during a dynamic landing task. Journal of Sports Rehabilitation 2013 22:83-92.

Deneweth JM, Newman K, Sylvia S, McLean SG, Arruda E. Heterogeneity of tibial plateau cartilage in response to a physiological compressive strain rate. Journal of Orthopaedic Research 2013 31:370-375.

Beaulieu M, Haladik JA, Bey MJ, McLean SG. Validation of a novel method for quantifying and comparing regional ACL Elongations. Journal of Biomechanics 2012 45:2710-2714.

Tsai LC, McLean SG, Colletti PM, Powers CM. Greater muscle co-contraction results in increased tibiofemoral compressive forces in females who have undergone anterior cruciate ligament reconstruction. Journal of Orthopaedic Research 2012 30:2007-2014.

Beaulieu M, McLean SG. Sex-dimorphic landing mechanics and their role within the noncontact ACL injury mechanism: evidence, limitations and directions. Sports Medicine Arthroscopic Rehabilitation Therapy Technology 2012 15:10-18.

Kipp K, McLean SG, Palmieri-Smith RM. Patterns of hip flexion motion predict frontal and transverse plane knee torques during a single-leg land-and-cut maneuver. Clinical Biomechanics 2011 26:504-508.

McLean SG, Oh Y, Palmer ML, Lucey SM, Lucarelli DD, Ashton-Miller JA, Wojtys EM. The relationship between tibial acceleration, tibial slope and ACL strain during a simulated landing task. Journal of Bone and Joint Surgery Am 2011 93:1310-1317.

Thomas AC, Palmieri-Smith RM, McLean SG. Isolated hip and ankle fatigue are unlikely factors for anterior cruciate ligament injury kinematic. Scandinavian Journal of Medicine and Science in Sports and Exercise 2011 21:359-368.

Thomas AC, McLean SG, Palmieri-Smith RM. Isolated quadriceps and hamstrings fatigue alters hip and knee mechanics. Journal of Applied Biomechanics 2010 26:159-170.

McLean SG, Borotikar B, Lucey SM. Lower limb muscle pre-motor time measures during a choice reaction task associate with knee abduction loads during dynamic single leg landings. Clinical Biomechanics 2010 25:563-569.

McLean SG, Lucey SM, Rohrer S, Brandon C. Knee joint anatomy predicts in vivo dynamic knee load states. Clinical Biomechanics 2010 25:781-788.

Shultz SJ, Schmitz RJ, Nguyen AD, Chaudhari AM, Padua DA, McLean SG, Sigward SM. ACL research retreat V: An update on ACL injury risk and prevention. Journal of Athletic Training 2010 45:499-508.

Deneweth JM, Bey MJ, McLean SG, Lock TR, Kolowich PA, Tashman S. ACL reconstructed knees do not restore normal tibiofemoral joint kinematics during single leg hopping. American Journal of Sports Medicine 2010 38:1820-1828.

McLean SG, Beaulieu M. Integrative Structural and Mechanical Contributions to ACL Injury Risk: Complex interactions requiring innovative solutions. Exercise Sports Science Reviews 2010 38:192-200.

Mizuno K, Andrish JT, van den Bogert AJ, McLean SG. Gender dimorphism in knee joint mechanics during combined 3D load states: Implications for ACL injury. Knee 16:432-440.

Brown TNc, Palmieri-Smith RM, McLean SG. Sex and limb differences in hip and knee kinematics and kinetics during anticipated and unanticipated jump landings: Implications for anterior cruciate ligament injury. British Journal of Sports Medicine 2009 43:1049-1056.

van den Bogert AJ, McLean SG. Comment on "A stochastic biomechanical model for risk and risk factors of non-contact anterior cruciate ligament injuries". Journal of Biomechanics 2009 42:1778-1779.

McLean SG, Samorezov J. Fatigue induced ACL injury risk stems from a degradation in central control. Medicine and Science in Sports and Exercise 2009 41:1661-1672.

Palmieri-Smith RM, McLean SG, Ashton-Miller JA, Wojtys EM. Association of quadriceps and hamstrings cocontraction patterns with knee joint loading. Journal of Athletic Training 2009 44:256-263.

McLean SG (2008). The ACL injury enigma: we can't prevent what we don't understand. Journal of Athletic Training 2008 43:538-40.

McLean SG, Huang X, van den Bogert AJ. Investigating isolated neuromuscular control contributions to non-contact anterior cruciate ligament injury risk via computer simulation methods. Clinical Biomechanics 2008 23:926-36.

Fening SD, Kovacic J, Kambic H, McLean SG, Scott J, Miniaci A. The effects of modified posterior tibial slope on anterior cruciate ligament strain and knee kinematics: a human cadaveric study. Journal of Knee Surgery 2008 21:205-11.

Borotikar BS, Newcomer R, Koppes R, McLean SG. Combined effects of fatigue and decision making on female lower limb landing postures: Central and peripheral contributions to ACL injury risk. Clinical Biomechanics 2008 23:81-92.

van den Bogert AJ, McLean SG. ACL injuries: do we know the mechanisms? Journal of Orthopaedic Sports Physical Therapy 2007 37:A8-9.

McLean SG, Fellin R, Suedekum N, Calabrese G, Passerallo A, Joy S. Impact of fatigue on gender-based high-risk landing strategies. Medicine and Science in Sports and Exercise 2007 39:502-514.

Erdimer A, McLean SG, Herzog W, van den Bogert AJ. Model based estimation of muscle forces during movements. Clinical Biomechanics 2007 22:131-154.

Myer GD, Ford KR, McLean SG, Hewett TE. Effect of plyometric versus dynamic stabilization and balance training on lower extremity biomechanics. American Journal of Sports Medicine 2006 34:445-455.

van den Bogert AJ, McLean SG. Letters to the editor. American Journal of Sports Medicine 2006 34:312-315.

McLean SG, Walker K, van den Bogert AJ. Effect of gender on lower limb kinematics during rapid deceleration changes: an integrated analysis of three sports movements. Science and Medicine in Sport 2005 8:411-422.

Hewett TE, Myer GD, Ford KR, Heidt RS, Colosimo A, McLean SG, van den Bogert AJ, Paterno M. Letter to the Editor. American Journal of Sports Medicine 2005.

McLean SG, Huang X, van den Bogert AJ. Association between lower extremity posture at contact and peak knee valgus moment during sidestepping: Implications for ACL injury. Clinical Biomechanics 2005 20:863-70.

McLean SG, Andrish JT, van den Bogert AJ. Comment on “Aggressive quadriceps loading can induce non-contact anterior cruciate ligament injury”. American Journal of Sports Medicine 2005 33: 1106-7.

McLean SG. Gender differences in frontal and sagittal plane biomechanics during drop landings. Medicine and Science in Sports and Exercise 2005 37: 1013.

McLean SG, Walker K, Ford KR, Myer GD, Hewett TE, van den Bogert AJ. Evaluation of a two-dimensional analysis method as a screening and evaluation tool for anterior cruciate ligament injury.

British Journal of Sports Medicine 2005 39: 355-362.

Hewett TE, Myer GD, Ford KR, Heidt RS, Colosimo A, McLean SG, van den Bogert AJ, Paterno M. Biomechanical measures of neuromuscular control and valgus loading of the knee predict ACL injury risk in female athletes: A prospective study. American Journal of Sports Medicine 2005 33: 492-501.

McLean SG, Huang X, van den Bogert AJ. Sagittal plane biomechanics cannot injure the ACL during sidestep cutting. Clinical Biomechanics 2004 19: 828-838.

McLean SG, Lipfert SE, van den Bogert AJ. Effect of gender and defensive opponent on the biomechanics of sidestep cutting. Medicine and Science in Sports and Exercise 2004 36: 1008-1016.

McLean SG, Su A, van den Bogert AJ. Development and validation of a 3D model to predict knee joint loading during dynamic movement. Journal of Biomechanical Engineering 2003 125: 864-874.

McLean SG, Neal RJ, Myers PT, Walters MR. Knee joint kinematics during the sidestep cutting manoeuvre: potential for injury in females. Medicine and Science in Sports and Exercise 1999 31: 959-968.

McLean SG, Myers PT, Neal RJ, Walters MR. A quantitative analysis of knee joint kinematics during the sidestep cutting maneuver. Implications for non-contact anterior cruciate ligament injury. Bulletin for Hospital of Joint Disease 1998 57: 30-38.

Presentations

Invited Presentations and Seminars

McLean SG. Changing the landscape of injury prevention - Invited Symposium. American Society of Biomechanics Annual Congress, Columbus, OH, August 5, 2015.

McLean SG. Field-based assessment of warfighter performance and performance degradation via a novel body-worn IMU array. American College of Sports Medicine Featured Science Session. Orlando, FL, May 28, 2014.

McLean SG. Taking the lab to the game: Towards innovative field-based injury screening and prevention. IOC World Conference: Prevention of Injury and Illness in Sport. Monaco, April 13, 2014.

McLean SG. Application of innovative technologies to assess injury risk and performance degradation in naturalistic settings: Moving beyond the lab. Invited Visiting Professor, Steadman Phillipon Research Institute ,Vail, CO, June 3, 2013.

McLean SG. Effects of maturation on lower limb female joint morphologies: Implications for short- and long-term joint health. Invited Faculty Presentation, University of Aalborg, Aalborg, Denmark, November 14, 2012.

McLean SG. Preventing what we don’t know. Modifiable and non-modifiable ACL injury risk factors. Feature Scientific Presentation. National Athletic Trainers Association Annual Meeting, St. Louis, MO. June 26 – 28, 2012.

McLean SG. Interactive morphological and mechanical contributions to knee joint health. Invited Visiting Professor Presentation, University of Oregon, Eugene, OR. April 13, 2012.

McLean SG. Evolving theories pertaining to the mechanism/s of non-contact ACL injury: Integrating the modifiable and non-modifiable factors. Invited Faculty Presentation, University of Limerick, Limerick, Ireland. March 12, 2012.

McLean SG. Fatigue contributions to knee loading during high-impact landings. Training the brain to protect the ACL. Invited Keynote Speaker, The Future of Fatigue: Defining the Problem, Bathurst, Australia. August 22-26, 2011.

McLean SG. Modelling individual-specific neuromuscular and morphologic contributions to knee injury: moving beyond homogeneous prevention models. Invited Symposium Speaker, European College of Sports Science, Liverpool, UK. July 6-9, 2011.

McLean SG. Training for a Stronger ACL: Integrative Anatomical and Ultrastructural Considerations. Invited Keynote at the Oslo Sports Trauma Research Center's Annual Spring Retreat, Oslo, Norway. May, 2011.

McLean SG. The ACL injury enigma: A complex problem requiring an equally complex solution. Invited Keynote Address, Second Muscletech Network Workshop, Barcelona, Spain. September, 2010.

McLean SG. Integrative morphologic and mechanical contributions to knee health across the lifespan. Invited Faculty Presentation, University of North Carolina, Greensboro, NC. April, 2010.

McLean SG. Anatomical predictors of high-risk knee joint loading states. Invited Symposium Speaker and Chair, 2nd World Congress on Sports Injury Prevention. Tromso, Norway, June 25-28, 2008.

McLean SG. The ACL injury enigma: We cannot prevent what we don't understand, Research Retreat IV – ACL Injuries: The Gender Bias, Greensboro, NC. April 3-5, 2008.

McLean SG. A combined assessment of the ACL injury mechanism: Where do we go from here? Invited visiting professor, Department of Physical Therapy, The University of Delaware, April, 2006.

McLean SG. Identifying the ACL injury mechanism: An integrative approach to a complex problem. Invited Symposium Chair, The American College of Sports Medicine Annual Conference, Denver CO, June, 2006.

McLean SG. The ACL injury dilemma: Prevention is impossible if we don't know the cause. Invited Keynote presentation at the Australian Conference of Science and Medicine in Sport, Melbourne Australia, 2005.

McLean SG, Huang X, Su A, van den Bogert AJ. Neuromuscular control contributions to ACL injury: Identification via computer simulation. Invited to present at the AESS Exercise and Sports Science Conference, Brisbane Australia, April, 2004.

Myers P, McLean SG, Neal R (1998). The Cutting Manoeuvre: Kinetics, Kinematics and Caution. Invited to present at the Football Australasia: Reducing the Injury List Conference. Melbourne, Australia, July, 1998.

Selected Published Abstracts and Conference Proceedings (from 112 Total)

Fox A, Cain SM, McGinnis RS, Davidson SP, Vitali R, Perkins NC, McLean SG. Ability of body worn inertial measurement units to detect changes in performance during a loaded step task. 7th World Congress of Biomechanics, Boston, MA, July 6-11, 2014.

Davidson SP, McGinnis RS, Cain SM, Vitali R, McLean SG, Perkins NC. Validating internal measurement units as a method for determining rifle aiming performance. 7th World Congress of Biomechanics, Boston, MA, July 6-11, 2014.

Cain SM, McGinnis RS, Davidson SP, Vitali R, McLean SG, Perkins NC. An IMU-based method for quantifying gait: algorithm development and comparisons to motion capture and instrumented treadmill data. 7th World Congress of Biomechanics, Boston, MA, July 6-11, 2014.

McGinnis RS, Cain SM, Davidson SP, Vitali R, McLean SG, Perkins NC. Validation of IMU-based method for tracking warfighter motion during jumping maneuver. 7th World Congress of Biomechanics, Boston, MA, July 6-11, 2014.

McGinnis RS, Cain SM, Davidson SP, Vitali R, McLean SG, Perkins NC. Validation of IMU-based method for tracking warfighter torso angle during up-down maneuver. 7th World Congress of Biomechanics, Boston, MA, July 6-11, 2014.

Cain SM, McGinnis RS, Davidson SP, Vitali R, Perkins NC, McLean SG. Using Inertial Measurement Units to Quantify Gait Performance. Dynamic Walking. Zurich, Switzerland, June 10-13, 2014.

McGinnis RS, Cain SM, Davidson SP, Vitali R, McLean SG, Perkins, NC. Validation of Complementary Filter Based IMU Data Fusion for Tracking Torso Angle and Rifle Orientation. 2014 ASME International Mechanical Engineering Congress and Exposition, Montreal, QC, November 14-20, 2014.

Davidson S, Goulet GC, Cain S, Perkins S, McLean SG. IMU derived predictors of jump landing performance success and degradation. 37th Annual Meeting of the American Society of Biomechanics, Omaha, NE, September 4-7, 2013.

Davidson S, Goulet GC, McLean SG. Modulating ACL and intercondylar notch indices in maturing females: Implications for ligament injury. XXIV Congress of the International Society of Biomechanics, Natal, Brazil, August 4-9, 2013.

Deneweth JM, Arruda EM, McLean SG. Evaluation of hyperelastic models for tibial articular cartilage under high strain rate loading. XXIV Congress of the International Society of Biomechanics, Natal, Brazil, August 4-9, 2013.

Deneweth JM, Newman KE, Pomeroy SM, Sylvia SM, Arruda EM, McLean SG. Physiological mechanical properties of healthy cartilage across the distal femur. XXIV Congress of the International Society of Biomechanics, Natal, Brazil, August 4-9, 2013.

Williams CM, Deneweth JM, Goulet GC, McLean SG. Maturation-induced modifications in non-modifiable tibial slope parameters. American College of Sports Medicine Annual Conference, Indianapolis, IN, May 28 – June 1, 2013.

Pomeroy SM, Deneweth JM, Goulet GC, McLean SG. Hamstring moment arm ratios in maturing females and their influence on ACL injury. American College of Sports Medicine Annual Conference, Indianapolis, IN, May 28 – June 1, 2013.

Davidson SP, Deneweth JM, Goulet GC, McLean SG. Effect of maturation scale on comparative knee joint morphologies. American College of Sports Medicine Annual Conference, Indianapolis, IN, May 28 – June 1, 2013.

Deneweth JM, Pomeroy SM, Arruda EM, McLean SG. Topographical mapping of human femoral elastic moduli under physiological loading. Orthopaedic Research Society Annual Meeting, San Antonio, TX, January 26-29, 2013.

Davidson SP, Deneweth JM, McLean SG. Maturational contributions to comparative lower limb muscle volumes: Implications for knee joint injury. Orthopaedic Research Society Annual Meeting, San Antonio, TX, January 26-29, 2013.

Williams CM, Deneweth JM, McLean SG. Maturation-induced modifications in “non-modifiable joint morphologic ACL injury predictors. Orthopaedic Research Society Annual Meeting, San Antonio, TX, January 26-29, 2013.

Deneweth JM, Newman KE, Sylvia SM, McLean SG, Arruda EM. Human tibial cartilage reveals non-linear and non-uniform regional topography under physiological loading rates. ASME Summer Bioengineering Conference, Puerto Rico, June 20-23, 2012.

Deneweth JM, Sylvia SM, Newman KE, McLean SG, Arruda EM. Mapping the Mechanical Topography of Healthy Tibial Cartilage. American Society of Biomechanics Annual Meeting. Gainesville, FL. August 15-18, 2012.

Deneweth J, Arruda E, Newman KE, McLean SG. Characterization of Regional Variations in Cartilage Stiffness Across the Human Tibia. Congress of the International Society of Biomechanics. July 4-7, 2011.

Deneweth J, McLean SG, Arruda E. Homogeneous Finite Element Formulations of Articular Cartilage Do Not Reflect Natural Indentation Mechanics. Transactions of the Orthopaedic Research Society, Long Beach, CA. January 16-18, 2011.

McLean SG, Oh Y, Lucey SM, Lucarelli DD, Ashton-Miller JA, Wojtys EH. Tibial acceleration and slope contributions to ACL loading during a simulated landing impact. Proceedings of the American Society of Biomechanics Annual Congress. Providence, RI. August, 2010.

McLean SG, Oh Y, Lucey SM, Lucarelli DD, Ashton-Miller JA, Wojtys EH. Integrative Impact of Tibial Slope and Tibial Acceleration on ACL Injury Risk. Proceedings of the 17th Congress of the European Society of Biomechanics, Edinburgh, Scotland. July 5-8, 2010.

Beaulieu ML, Brown TN, Palmieri-Smith RM, McLean SG. Association between muscle activation patterns, muscle strength, and knee mechanics during a jump landing task varies across maturation. Proceedings of the 17th Congress of the European Society of Biomechanics, Edinburgh, UK. July 5-8, 2010.

Beaulieu ML, Brown TN, Palmieri-Smith RM, McLean SG. Relationship between knee mechanics during a jump landing task and hip strength varies across maturation. Proceedings of the 57th Annual Meeting of the American College of Sport Medicine, Baltimore, MD. June 2-5, 2010.

McLean SG, Rohrer S, Brandon C. Association between knee structure and mechanics during dynamic single leg landings: Implications for ACL injury. American College of Sports Medicine Annual Congress. Seattle, WA. May 26-29, 2009.

McLean SG, Rohrer S, Brandon C. Knee joint anatomy predicts in vivo dynamic knee load states. Orthopaedic Research Society Annual Congress, Las Vegas, February, 2009.

McLean SG, Samorezov J, Palmieri-Smith RM. Non-contact ACL injury risk is linked directly to fatigue-induced central pathway degradation. 2nd World Congress on Sports Injury Prevention. Tromso, Norway, June 25-28, 2008.

McLean SG, Samorezov J, Parekh J. Fatigue induced changes in central control increases dynamic knee loading. American College of Sports Medicine Annual Congress. Indianapolis, IN. May 26-29, 2008.

McLean SG, Koppes R, Huang X, Newcomer R, Borotikar B (2007). Combined effects of fatigue and decision making on landing mechanics: Central and peripheral contributions to injury risk. American College of Sports Medicine Annual Conference, New Orleans, USA, May 31-June 3, 2007.

McLean SG, Fellin R, van den Bogert AJ, Calabrese G, Passerallo A, Joy S. Effects of a generalized neuromuscular fatigue protocol on lower limb joint mechanics during a jump landing task. American College of Sports Medicine Annual Conference, Denver, USA, May 31-June 3, 2006.

Saunders N, Otago L, McLean SG. Differences in lower-limb neuromuscular control between sports movements executed in laboratory and game settings. XXth Congress of the International Society of

Biomechanics and 29th Annual Conference of the American Society of Biomechanics, Cleveland, USA, August 1-5, 2005.

Mizuno K, Andrish JT, Su A, van den Bogert AJ, McLean SG. Gender dimorphism in knee joint mechanics affects ACL loading. XXth Congress of the International Society of Biomechanics and 29th Annual Conference of the American Society of Biomechanics, Cleveland, USA, August 1-5, 2005.

McLean SG, Huang X, van den Bogert AJ. Sagittal plane biomechanics during sports movement does not explain higher incidence of ACL injuries in females. XXth Congress of the International Society of Biomechanics and 29th Annual Conference of the American Society of Biomechanics, Cleveland, USA, August 1-5, 2005.

McLean SG, Huang X, Su A, van den Bogert AJ. Neuromuscular control contributions to non-contact ACL injury. Transactions of the Orthopaedic Research Society, Washington D.C., Feb, 2005.

Hewett TE, Myer GD, Ford KR, Heidt RS, Colosimo A, McLean SG, van den Bogert AJ, Paterno M. Biomechanical Measures of Neuromuscular Control and Valgus Loading of the Knee Predict ACL Injury Risk in Female Athletes: A Prospective Study. AOSSM, Annual Meeting, 2004.

McLean SG, Huang X, Su A, van den Bogert AJ. Identification of neuromuscular control contributors to non-contact ACL injury via computer simulation techniques. Proceedings of the European Society of Biomechanics Annual Conference, The Netherlands, July 4-6, 2004.

McLean SG, Su A, van den Bogert AJ. Determining neuromuscular contributions to ACL injury risk via computer simulation. Transactions of the 49th Annual Meeting of the Orthopaedic Research Society, Vol 48, New Orleans, USA, 2003.

McLean SG, Lipfert S, Bogert AJ van den. Effects of a simulated defensive opponent on sidestep biomechanics. Accepted for presentation at the XIXth Congress of the International Society of Biomechanics, Dunedin, New Zealand, 2003.

McLean SG, Su A, Bogert AJ van den. Estimating 3D external knee loading during sidestepping and their role in ACL injury via computer simulation. Proceedings of the Orthopaedic Research Society, New Orleans, USA, Feb 1st-5th, 2003.

van den Bogert AJ, Su A, McLean SG, Huang, X. Forward dynamic modeling of acute injury: Effective methods for optimization, validation and experimentation. Proceedings of the IVth World Congress of Biomechanics, Calgary, Canada, Aug, 2002.

McLean SG, Su A, Bogert AJ van den. Determining neuromuscular contributions to ACL injury risk via computer simulation. Proceedings of the IVth World Congress of Biomechanics, Calgary, Canada, August 4th – 9th, 2002.

McLean SG, Su A, Bogert AJ van den. A 3D computer model for non-contact ACL injury simulation. XVIIIth Congress of the International Society of Biomechanics, Zurich, Switzerland, 2001.

McLean SG, Su A, Bogert AJ van den. Simulation of acute musculoskeletal injuries in humans: a novel approach. 8th International Symposium on Computer Simulation in Biomechanics, Milan, Italy, pp. 23-27, 2000.

McLean SG, Bogert AJ van den. ACL elongations during running and sidestepping. American Society of Biomechanics Annual Conference, Chicago, July 19-23, 2000.

McLean, S.G. and Bogert, A.J. van den. Quantification of in vivo ACL elongation during dynamic joint movements: A new methodology. Combined French and Canadian Societies of Biomechanics Annual Conference, Montreal, August, 2000.

McLean SG, Neal, R, Daniel W, Galloway G, Myers P. Mechanical response of the ACL to hazardous movements. Ann. Biomed. Engng. 26, Suppl. 1:S111. Abstract supplement for annual meeting of the Biomedical Engineering Society, Cleveland OH, 1998.

McLean S, Neal R, Daniel W, Galloway G, Grozier S, Myers P. The in vivo mechanical response of the ACL during a typical sidestep cutting maneuver. Sports Medicine Australia Annual Conference (Qld Branch), Coolum, Queensland, Australia, 1998.

McLean, S., Neal, R. and Walters, M. Three-dimensional knee joint kinetics during running – characterization of joint moment patterns. Proceedings of the Second Australia and New Zealand Society of Biomechanics Conference. Auckland, New Zealand, January 1998.

McLean, S., Neal, R., Myers, P. and Macdonald, M. Gender comparisons of knee joint biomechanics during sidestep cutting manoeuvres: Implications for injury. Proceedings of the International Society of Biomechanics Congress, XVI. Tokyo, Japan, August 1997.

McLean, S., Myers, P. and Neal, R. Knee kinematics during the cutting manoeuvre: A clinical Perspective. Proceedings of the Biennial Congress of the International Society of Arthroscopy, Knee Surgery and Sports Medicine. Buenos Aires, Argentina, May 1997.

Myers, P., McLean, S. and Neal, R. The cutting manoeuvre as a mechanism of non-contact ACL injury. Presented at The Australian Knee Society Annual Conference. Perth, Western Australia, 1996.

Project Experience

Principal Investigator on large-scale research effort utilizing state-of-the-art wearable technologies to develop, analyze and optimize complex warfighter performance metrics in a variety of naturalistic military environments.

Lead a series of experiments for high-profile sports company investigating impact of new sports-specific apparel designs on resultant performance outcomes and injury risk via novel wearable technologies.

Lead a successful research initiative for the National Football League examining effects of game-induced neuromuscular fatigue on key performance outcomes and the subsequent risk of lower limb injury.

Lead a government funded research project adopting complex 3-D computational modeling methods to evaluate mechanisms of knee joint injury and disease risk in at risk female sports populations.

Editorships & Editorial Review Boards

Editorial Board, Journal of Science and Medicine in Sport, 2005 – 2011

Editorial Board, Medicine and Science in Sports and Exercise, 2006 – 2011

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