

# Research Retreat IV- ACL INJURIES: THE GENDER BIAS

## April 3 - 5, 2008

### Thursday, April 3<sup>rd</sup>

6:00 – 9:00 p.m. Opening Reception @ Natty Greene's Pub & Brewing Co.

### Friday, April 4<sup>th</sup>

7:15 – 8:00 a.m. Registration and Breakfast

8:00 – 8:15 a.m. Welcome and Introductions

8:15 – 8:45 a.m. **OPENING SPEAKER: Dr. Mary Lloyd Ireland, MD**  
**"A Historical Perspective on the Gender Bias in ACL Injury" – What Research Has Taught Us in the Past 20 Years"**

8:45 – 9:00 a.m. **Question and Answer**

9:00 – 10:15 noon **ABSTRACT PRESENTATIONS (10 min present / 5 min Q & A)**  
**Landing Mechanics – Sagittal Plane Alterations**  
**Moderator: Riann Palmieri-Smith PhD, ATC**

9:00 – *Ground Reaction Forces, but Not Knee Muscle Activation, or Sagittal Knee Joint Stiffness Differ Between Female Dancers and Basketball Players during Drop Jumps (Ambegaonkar JP, Shultz SJ, Perrin DH, Schmitz RJ, Ackerman T, Schulz MR)*

9:15 – *Influence of Ankle Dorsiflexion Range of Motion and Lower Leg Muscle Activation on Medial Knee Displacement During a Double-Legged Squat (Bell DR and Padua DA)*

9:30 – *The Effects of a Prophylactic Ankle Brace on Lower Extremity Biomechanics During Drop Landing (Yom JP, Bowser B, Arnett SW, Fu YC, Simpson KJ)*

9:45 – *Stiff Landing Increases Frontal Plane Loading of the Knee (Pollard CD, Sigward SM, Powers CM)*

10:00 – *Trunk Flexion Angle and Ground Reaction Force as Predictors of Knee Anterior Shear Forces in Males and Females (Kulas AS, Hortobagyi T, DeVita P)*

10:15 – 10:30 a.m. Break

10:30 – 12:00 a.m. **ABSTRACT PRESENTATIONS (10 min present / 5 min Q & A)**  
**Landing & Cutting – Gender Comparison Studies**  
**Moderator: Susan M. Sigward PhD, ATC, PT**

10:30 – *Lower Extremity Kinetic Differences During Drop-Jump Landings Between Prepubescent Males and Females (Jackson KR, Garrison JC, Ingersoll CD, Hertel J)*

10:45 – *Comparison of Lower Extremity Coordination and Variability During a Jump-Landing Between Sexes (McGrath ML, Padua DA, Thigpen CA)*

11:00 – *Gender Differences in Quadriceps and Hamstring Co-contraction Patterns are Associated with Knee Joint Loading (Palmieri-Smith RM, McLean SG, Ashton-Miller JA, Wojtys EM)*

11:15 – *Gender Differences in Hip and Knee Neuromuscular Activity During A Single-Leg Landing (Bolgla LA)*

11:30 – *Gender Differences in Neuromuscular Control of The Hip: Implications for Acute Non-Contact Anterior Cruciate Ligament Injury (Stearne DJ, Sitler MR, Tierney RT, Covassin TM, Davis KF, Barr AE, Kendrick ZV, Torg JS)*

11:45 – *Transverse Plane Positioning of the Hip is Different Between Males and Females During a Sidestep Cut (Medina-McKeon J, Denegar CR, Hertel J)*

- 12:00 – 12:30 p.m. **Discussion of Morning Papers (R Palmieri-Smith and SM Sigward)**
- 12:30 – 1:15 p.m. Lunch
- 1:15 – 2:00 p.m. **KEYNOTE: Dr. Scott McLean, PhD**  
**“Current Theory and Findings Related to Neuromuscular and Biomechanical Risk Factors”**
- 2:00 – 2:30 p.m. **Discussion of Keynote (RJ Schmitz & CD Pollard)**
- 2:30 – 2:45 p.m. Break
- 2:45 – 4:30 p.m. **ABSTRACT PRESENTATIONS (10 min present / 5 min Q & A)**  
**Landing & Cutting – Fatigue and Perturbation Studies**  
**Moderator: Darin A. Padua PhD, ATC**
- 2:45 – *Gender Differences in Time-Frequency EMG Analysis of Unanticipated Cutting Maneuvers (Beaulieu ML, Lamontagne M, Xu L)*
- 3:00 – *An Unanticipated Stimulus Alters Lower Limb Mechanics During Single-Leg Landing (Brown TN, Palmieri-Smith RM, McLean SG)*
- 3:15 – *The Effect of a Rotational In-Flight Perturbation on Landing Biomechanics (Arnett SW, Fu YC, Thompson R, Sigurdsson P, Simpson KJ)*
- 3:30 – *Footwear Does Not Alter Muscle Response Time Following a Weight Bearing Rotary Perturbation (Lindenberg K, Carcia CR)*
- 3:45 – *Isolated Quadriceps and Hamstrings Fatigue Alters Hip and Knee Mechanics (Thomas AC, McLean SG, Palmieri-Smith RM)*
- 4:00 – *Fatigue-Induced Changes in Central Control Increases Non-Contact ACL Injury Risk in Females (Parekh JN, Palmieri-Smith RM, McLean SG)*
- 4:15 – *The Effects of Fatigue and Recovery on Knee Kinetics and Kinematics During Side-Step Cutting (Tsai LC, Sigward SM, Pollard CD, Fletcher MJ, Powers CM)*
- 4:30 – 5:00 p.m. **Discussion of Fatigue and Perturbation Studies (DA Padua & AS Kulas)**
- 6:00 – 8:00 p.m. Host Dinner @ Ganache

**Saturday, April 5<sup>th</sup>**

- 8:00 – 9:45 a.m. **ABSTRACT PRESENTATIONS (10 min present / 5 min Q & A)**  
**Anatomical and Hormonal Factors**  
**Moderator: Scott McLean PhD**
- 8:00 – *Comparison of Cyclic Variations in Anterior Knee Laxity, Genu Recurvatum and General Joint Laxity Across the Female Menstrual Cycle (Shultz SJ, Nguyen AD, Perrin DH)*
- 8:15 – *ACL-Injured Subjects Have Smaller ACLs than Matched Controls: An MRI Study (Chaudhari AM, Zelman EA, Jia G, Kaeding CC, Flanigan DC, Knopp MV)*
- 8:30 – *Differences in Lower Extremity Anatomy and Posture Characteristics in Males and Females Between Maturation Groups (Nguyen A, Schmitz RJ, Shultz SJ)*
- 8:45 – *Subject Specific Computational Modeling to Predict the Effect of Anatomy on ACL Loading (Borotikar BS and van den Bogert AJ)*
- 9:00 – *The Tibial Plateau and Its Influence on the Biomechanics of the Tibiofemoral Joint: A Sex-Based Comparison in a Blinded Study (Hashemi J, Chandrashekar N, Gill B, Beynnon BD, Slauterbeck JR, Schutt R, Dabezies E)*
- 9:15 – *Sex Differences in Accessory Knee Motion During the Transition From Non-Weight Bearing to Weight Bearing (Schmitz RJ, Nguyen AD, Shultz SJ)*

9:30 – 10:00 a.m.	<b>Discussion of Anatomy &amp; Hormone Papers (SG McLean &amp; BD Beynnon)</b>
10:00 – 10:15 a.m.	
10:15 – 11:00 a.m.	<b>KEYNOTE: Dr. Bruce Beynnon, PhD</b> <b>“Current Theory and Findings Related to Anatomical and Hormonal Risk Factors”</b>
11:00 – 11:30 noon	<b>Discussion of Keynote (AD Nguyen &amp; SJ Shultz)</b>
11:30 – 12:15 p.m.	Lunch
12:15 – 2:00 p.m.	Abstract Presentations (10 min present / 5 min Q & A) Risk Factor Screening and Prevention <b>Moderator: Chris M. Powers PhD, PT</b>
12:15 –	<i>History of Prior ACL Injury as a Risk Factor for Incident ACL Injury (Marshall SW, Padua DA, Beutler AI, Boling M, Garrett B)</i>
12:30 –	<i>Lower Extremity Strength as Risk Factors for ACL Injury: Preliminary Data (Boling M, Marshall SW, Padua DA, Beutler AI)</i>
12:45 –	<i>The Effects of Leg Dominance and Strength Imbalance in the Kinematic of Female Recreational Athletes in a Stop-Jump Task (Herman DC, Moore AL, Cruz AR, Garrett WE, Yu B, Padua DA)</i>
1:00 –	<i>A Lack of Correlation between Static and Dynamic Measures of Postural Stability (Sell TC, House AJ, Huang HC, Abt JP, Lephart SM)</i>
1:15 –	<i>The Influence of an ACL Injury Prevention Program on Knee Valgus Moments During Cutting: An Evaluation of Pre-Pubertal, Pubertal and Post-Pubertal Female Athletes (Sigward SM, Pollard CD, Powers CM)</i>
1:30 –	<i>A 12-Week Pre-Practice Exercise Intervention Decreases Ground Reaction Forces During Jumping in High School Basketball Players (Joyce CJ, Thigpen CA, Buckley BD, Padua DA)</i>
1:45 -	<i>Movement Change Retention Following an Anterior Cruciate Ligament Injury Prevention Program (DiStefano LJ, Padua DA, DiStefano MJ, Marshall SW)</i>
2:00 – 2:30 p.m.	<b>Discussion (CM Powers and JA Onate)</b>
2:30 – 2:45 p.m.	Break
2:45 – 5:15 p.m.	CONSENSUS MEETING  <b><i>Neuromuscular Factors – Sigward and Bolga, Consensus Leaders</i></b> <b><i>Biomechanical Factors – McLean and Schmitz, Consensus Leaders</i></b> <b><i>Anatomical and Hormonal Factors – Nguyen and Hashemi, Consensus Leaders</i></b> <b><i>Injury Risk Screening and Prevention – Padua and Powers, Consensus Leaders</i></b>
6:30 – 10:00 p.m.	Informal Dinner Reception @ Dave Perrin’s