Female athletes who participate in jumping and pivoting sports are four to six times more likely to sustain a knee ligament injury, such as anterior cruciate ligament (ACL) injury, than male athletes participating in the same sports. Geometric growth in female athletic participation, coupled with the four to six-fold higher injury rate, has led to a widening gender gap in the number of serious knee ligament injuries. The majority of ACL injuries occur by non-contact mechanisms, often during landing from a jump or making a lateral pivot while running. There are several possible contributing biomechanical and neuromuscular factors related to the increased incidence of knee injury in female athletes.

This talk reviews 15 years of Dr. Hewett’s work and the results of his latest epidemiological-biomechanical and neuromuscular findings associated with the sex differences in ACL injury and details the development of strategies for risk assessment and prevention of ACL injuries.
UNDERSTANDING AND PREVENTION AND REHABILITATION OF ACL INJURIES IN ATHLETES:
FROM POOR NEUROMUSCULAR CONTROL TO OPTIMAL RETURN TO SPORT

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Course Description:

Female athletes who participate in jumping and pivoting sports are four to six times more likely to sustain a knee ligament injury, such as anterior cruciate ligament (ACL) injury, than male athletes participating in the same sports. Geometric growth in female athletic participation, coupled with the four to six-fold higher injury rate, has led to a widening gender gap in the number of serious knee ligament injuries. The majority of ACL injuries occur by non-contact mechanisms, often during landing from a jump or making a lateral pivot while running. Anatomic, hormonal and neuromuscular gender differences are possible contributing factors to the increased incidence of knee injury in female athletes. This course reviews the three theories associated with the gender differences in knee injury rate and details the development of strategies for assessment of risk and the prevention of these injuries. Dr. Hewett will show the latest data regarding the assessment for individuals at high risk for ACL injury and demonstrate neuromuscular training principles to prevent injuries in this high risk population.

Course Objectives:

Upon completion of this course, the participant will be able to:

1. Give a summary of the epidemiology and potential risk factors of knee and anterior cruciate ligament (ACL) injury risk.

2. Detail the theories relating to the gender gap in athletic knee injuries, including anatomic, hormonal, and neuromuscular gender differences.

3. Design and develop screening protocols to identify high-risk female athletes that demonstrate neuromuscular control deficits.

4. Develop and implement neuromuscular training interventions for decreasing ACL injury risk.

5. Design rehabilitation protocols to specifically address neuromuscular deficits in the ACLR female athlete.
Implications for Participants and Skills Developed:

Recent studies support the effectiveness of dynamic neuromuscular training in decreasing landing forces and valgus torques at the knee. Early detection of altered muscle activation strategies may be critical in the identification of female athletes who would most benefit from targeted neuromuscular training. This information may be useful for the design and development of interventions aimed at altering lower extremity biomechanics for safer landing positions, reducing landing forces, and increasing energy absorption by the lower extremity musculature. The development of screening and intervention protocols may lead to the reduction of ACL injury incidence in female athletes via the identification of the subgroup of potentially high-risk female athletes that demonstrate neuromuscular control deficits.

Upon completion of this course, the participant will be able to:

1. Give a summary of the epidemiology and potential risk factors of knee and anterior cruciate ligament (ACL) injury risk.
2. Detail the theories relating to the gender gap in athletic knee injuries, including anatomic, hormonal, and neuromuscular gender differences.
3. Design and develop screening protocols to identify high-risk female athletes that demonstrate neuromuscular control deficits.
4. Develop and implement neuromuscular training interventions for decreasing ACL injury risk.
5. Design rehabilitation protocols to specifically address neuromuscular deficits in the ACLR female athlete.

Outline of Time and Content:

8:30 a.m.  Continental Breakfast
9:00-9:30 a.m.  ACL Injuries in female athletes, defining the problem, Timothy Hewett, Ph.D.
9:31-10:30 a.m.  Risk Factors for ACL Injury
10:31-11:30 a.m.  Training Strategies for the Prevention of Knee Injuries in Female Athletes, Tim Hewett, Ph.D.
11:31-11:45 a.m.  Question and Answer
11:46 a.m.-1:00 p.m.  Lunch Break
1:00-1:59 p.m.  Dynamic Neuromuscular Analysis Training for Injury Prevention and Athletic Development
2:00-2:45 p.m.  Hands on Workshop: Neuromuscular Training Techniques
2:46-2:59 p.m.  Question and Answer
3:00-3:10 p.m.  Break
3:11-3:40 p.m.  Relevant concepts in ACLR rehabilitation - Return to sport training.
3:41-4:00 p.m.  Question and Answer