

Study takes next step -- Why women suffer more knee injuries

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Female athletes are up to eight times more likely to suffer knee injuries during their careers than males, and now researchers may be closer to understanding why.

A recent study of 10 female and 10 male NCAA athletes completed within the Department of Biomedical Engineering at the Cleveland Clinic found that female athletes tend to land from a jump with a more flexed ankle, the foot rolling outward with an elevated arch, and more knee abduction and knee internal rotation compared to male athletes.

When fatigued, differences between women and men in these movements and loads were even larger, possibly explaining why females may be at greater risk of non-contact anterior cruciate ligament (ACL) injury during landing

The study's lead researcher, Scott McLean, was previously at Cleveland Clinic and is now an assistant professor with the Division of Kinesiology at the University of Michigan. The study will be published in the March issue of *Medicine and Science in Sports and Exercise*.

According to the NCAA, female athletes are at least twice as likely to suffer an ACL injury as male athletes and in some cases up to eight times more likely. Research shows that one in 10 female athletes will experience an ACL injury at some point in their career.

"Before we can even consider trying to successfully prevent ACL

injuries in both men and women, we need to clearly identify their underlying causes or mechanisms," McLean said. "This study presents an important step in achieving these ultimate research goals. It seems that when fatigued, the potential for an athlete to execute poor decisions, reactions and thus movement responses is greatly increased. Our next step is to determine how we can effectively combat these effects."

"Fatigue affects individuals differently. As we begin to pinpoint how fatigue relates to joint motion during sports movements, we hope to gain a better understanding of how ACL injuries occur and how to prevent them." said Dr. Susan Joy, director of Woman's Sports Health at Cleveland Clinic and study co-author.

During the study, athletes were observed drop-jumping in the Cleveland Clinic Lerner Research Center's Biomechanics lab. The athletes had their movement recorded using three dimensional high-speed motion analysis techniques to examine lower-limb-joint kinematics and kinetics during 10 drop jumps, both before and after fatigue.

Gary Calabrese, director, Cleveland Clinic Sports Health Rehabilitation and the study's co-author said the findings open the door for further research and clinical application.

"Understanding when and why athletes suffer debilitating knee injuries helps us develop more successful and personalized treatment and prevention programs for at-risk individuals," Calabrese said.

Source: University of Michigan

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