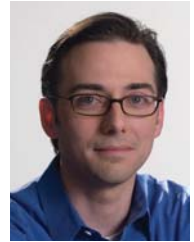


Preventing ACL Tears: Why Are ACL Tears More Common In Female Athletes?

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The story is all too familiar, a promising young athlete lands awkwardly in a game, hears a “pop” followed by sudden pain and development of swelling. Sometimes, an opponent falls on the athlete, causing the knee to “shift.” In either case, the season is over and the athlete’s future is now in question.

It is doubtful that anyone involved in athletics today is unfamiliar with the letters ACL—Anterior Cruciate Ligament. The ACL is injured in 1 of every 3000 individuals each year, and are classified as either **Contact** or as **Non-contact** injuries. Contact injuries are those in which one athlete collides with another. Approximately 70% of ACL injuries, however, are Non-contact injuries—the athlete plants his foot, pivots, and then feels something “pop.” Shockingly, perhaps, female athletes sustain Non-contact ACL tears at a rate 5 times higher than their male counterparts.

WHY?

There are many theories, and over the last two decades, many studies have attempted to answer this simple question. Some have implicated the supposed negative effects of estrogen (and other hormones associated with menstruation) on ligament strength. Others have suggested that the increased width of a woman’s pelvis was responsible for the greater stress on a woman’s ACL. More recently, attention has focused on evaluating the manner in which young athletes perform simple tasks such as running and jumping. Recent evidence demonstrates that male and female athletes perform these tasks differently.

THE ANSWER:

Overwhelmingly, female athletes put greater stress on their knees (and particularly the ACL) as a result of different biomechanics. Three factors in particular have been identified:

1. Females’ knees are more “turned in” (toward the midline of the body).
2. Females’ knees are less bent when jumping and landing.
3. Females jump and run with the soles of the feet in a more rigid position and directed away from the body’s center of gravity.

When running and jumping it is important to bend at the ankles, knees and hips. We now know that, in general, even well-trained female athletes tend to “lock out” (straighten rather than bend) their legs—especially when jumping, and tend to land with a “flat foot” and a “straighter leg” than their male counterparts. Although we aren’t yet aware of the reason for this, we do know that this is not desirable, and does predispose to tearing one’s ACL. Most athletes and former athletes have heard coaches instruct their charges to assume and to maintain a “good athletic stance”—meaning, “weight on the balls of your feet, with knees and hips bent, rear-end down and chest up.” Scientific evidence now has proven that “coach” was right. Although the scientists and researchers use fancier language, their findings confirm that maintaining

this body position or “stance” is proving to be a major factor in preventing or lessening the occurrence of non-contact ACL injuries.

In light of these findings, we not only have a better understanding of the answer to the question: “Why are ACL tears more common in female athletes?,” but also the ability to prescribe a “cure.” Even more exciting, the cure is not some new, outlandish, complicated, surgical procedure requiring months of recovery, but a **preventative** rehabilitation program that can be performed by any athlete. In our next column we will explore, discuss and outline these programs, and how you may use them to your benefit and to further your own athletic aspirations.

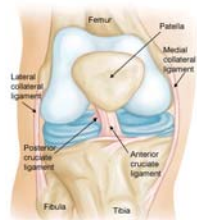


Figure 1. Three bones meet to form your knee joint: your thighbone (femur), shinbone (tibia), and kneecap (patella). Bones are connected to other bones by ligaments. There are four primary ligaments in your knee. They act like strong ropes to hold the bones together.



Figure 2 The Anterior Cruciate Ligament (ACL) runs diagonally in the middle of the knee. It prevents the tibia from sliding out in front of the femur, as well as provides rotational stability to the knee.

The author would like to acknowledge Danielle Willsie, MS, ATC/LAT co-author of this article. Danielle is an athletic trainer at Albion College specializing in injury prevention and “pre-injury” education.

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