Proper training can reduce ACL risks in female athletes

By Anna Gramling
ESPN.com

It's the three-letter acronym that is every athlete's nightmare.

Yet a torn ACL, or anterior cruciate ligament, is an injury that can't be ignored, especially by female athletes.

According to The Houston Chronicle, one in every 10 female college athletes will suffer a torn ACL each year.

Recent statistics show the chances for a major knee injury are four to eight times higher for females than males.

Why such a large discrepancy between men and women? The answer to that question remains unresolved, but there are numerous theories. Some link the higher injury rate in females to environmental, anatomic, hormonal and biomechanical factors, while others claim that differences in training (coaching and strength techniques) lead to the devastating injury.

"I think that being in great shape physically can help in preventing an ACL tear, but I honestly believe that an ACL injury can happen to anyone at any time," Baylor softball player Kelly Osburn told ESPN.com. The outfielder tore the ACL in her right knee in 2005 before making a comeback last season.

"When my injury occurred, I feel like I was in very good shape, and that is why it came as a huge shock to me. Now that I have had some time off, I am just starting to feel pain free. I still do not feel like I have all of the strength back in my right leg."

Some NCAA schools emphasize proper training and exercise, including a strong strength and conditioning program, in hopes of reducing the risks for their athletes.

Sara Wiley, the strength and conditioning coach at Minnesota, says her players utilize a multidimensional approach to prevention.

"First, we teach athletes to decelerate with proper mechanics either from a jump or a sprint. This way, we reinforce proper mechanics of landing and deceleration, as well as strengthen around the joint. It also contributes to the development of explosiveness, quickness and agility. We also move in multiple planes [i.e. forward-backward, side-to-side, etc.] In addition, we include simple drills that teach the nervous system to fire rapidly, as well as promote stability around the knee joint."

Wiley also has her athletes participate in preventive exercises that she says set the stage for further development of performance (speed, power, quickness and agility).

"We do activities prior to strength training or conditioning that can be consider 'prehab' type exercises that fit nicely in the warm up -- single and double leg line hops, catching and throwing while the athlete is squatting, single leg..."
hamstring work, etc., to activate the hamstrings prior to beginning training. These vary daily, but [they] reinforce the mechanics, balance, coordination and muscle activation we are training more aggressively in the actual workout."

In the case of the women's basketball team at Tennessee, it's about wearing the right shoes.

Jenny Moshak, the Vols' assistant athletics director for sports medicine who works primarily with Pat Summitt's team, said she talked with adidas about redesigning their shoes a few years ago.

Moshak requested several characteristics in a shoe:

1. A neutral last -- which is the bottom base of the shoe around which the rest of the shoe is constructed -- as opposed to a curved last. This was to start with a neutral base.
2. A high and deep heel counter, which is the portion of the shoe that stabilizes the heel of the foot once it hits the ground. A shoe will not be able to control how [or in what position] an athlete's heel hits the ground. However, once it does hit, the heel should not move, slide or rotate.
3. A stable forefoot -- not flimsy. The movement in a foot/shoe should occur at the midfoot and not the forefoot.
4. Proportions suitable for narrow feet. Just because a foot gets longer, it does not necessarily get incrementally wider.

"The relationship between the shoe construction and ACL prevention is that we do a lot with foot orthosis," Moshak said. "If our athletes' feet do not hit the ground in a neutral position, we will bring the ground up to their foot with orthotics and correct biomechanical issues. Therefore, we want stable, neutral, movement-correct, properly fitting shoes so that the orthotic works optimally."

The Lady Vols have been wearing shoes with these characteristics since 1999, according to Moshak. Although they do not keep statistics on whether or not the shoes prevent injuries, Moshak is convinced that they help in alleviating a number of injuries.

Another popular and rigorous program that helps reduce ACL injuries and enhance performance is Sportsmetrics, which was founded by renowned Cincinnati surgeon Dr. Frank Noyes.

The U.S. Naval Academy, Kentucky, North Carolina, Washington, Wake Forest, Tennessee, Kansas and Baylor are just a few of the Division I schools that have used Sportsmetrics, administrative director Tommy Campbell said.

The principle element of Sportsmetrics teaches female athletes the benefits of proper jumping and landing techniques.

Sportsmetrics is a six-week rehabilitation program that consists of three one-hour sessions per week. It incorporates stretches, jump/plyometric training, and strength and coordination exercises. The landing techniques emphasized by Sportsmetrics allow for more controlled knee joint actions while providing stability at the same time.

Participating in one or all of these methods isn't foolproof and an ACL injury can still occur. But the earlier a female athlete begins a preventive program, the better off she may be in the long run.

"I can tell you that in the last five years we have trained and/or tested over 1,000 female athletes," Campbell said. "Our program is geared for high school athletes and in our attempt to train as many athletes as possible, we feel comfortable that the athletes that decide to continue their sporting careers are trained in the areas of injury prevention. The goal is to train younger athletes in order to give them the chance to continue their career and not to be out of their sport due to a preventable injury."

How do you avoid another ACL injury?

If you have already had an ACL injury, you can avoid another ACL injury by:

- Strengthening the injured knee through rehabilitation exercises.
- Changing your sports techniques to avoid motions that might stress the injured knee.
- Changing your lifestyle to avoid sports that have a high risk of injuring your knee further, such as skiing, football, soccer or basketball.
- Wearing a knee brace during high-risk activities. However, braces should be used only if rehabilitation is also being done. Wearing a brace alone may be of little benefit and may give you a false sense of security.

Source: WebMD

Anna Gramling is an assistant college sports editor at ESPN.com.