



ESPN.com: TrainingRoom

[\[Print without images\]](#)

Wednesday, January 17, 2001

Updated: November 20, 4:33 PM ET

none

Women's ACL injuries: A gender gap?

From [Professional Team Physicians](#)

Over the past several years, orthopedic and sports medicine clinics have seen an alarming number of female athletes with knee injuries, especially those to the ACL. "Since the early '90s, the predisposition of women to ACL injuries has become a very hot topic of study," says Dr. T.O. Souryal, a member of [Professional Team Physicians](#) and one of the pioneering researchers on ACL injuries. "Although we know that women proportionally suffer more ACL injuries than men, at this time, no one knows exactly why."

Join Dr. Souryal as he discusses this issue and examines the possible factors that may contribute to the higher rate of ACL injuries in women.

Describe the function of the ACL.

Dr. Souryal: The anterior cruciate ligament (ACL) is one of four main ligaments of the knee. Although it is the smallest of the four, it plays perhaps the most important role. Not only does it keep the tibia (shin bone) from pushing forward on the knee, it stabilizes the knee in rotation.

So in sports that are mostly straight-ahead -- jogging, swimming, biking -- the ACL has virtually no function. But in the sports that involve cutting, planting and changing direction, the ACL plays a vital role.

Do women suffer from a higher percentage of ACL injuries?

Dr. Souryal: Yes. Over the last five to 10 years, we've stumbled onto the fact that the ACL injury rate in women is twice as high as it is in men. In 1988, a study was done looking at predisposing factors for ACL injuries in general. At that time, gender was not considered a predisposition. What we found was that there was a structural predisposition that is detectable on an X-ray. Some people are born with a narrow tunnel that entraps the ACL.

In a follow-up study done in 1992, we discovered that women have a propensity for this type of structure and as a result were more likely to suffer injuries to the ACL. Since then, the subject of women and ACL injuries has become a hot topic. But I think there is more to it than bone structure.

What other factors may be involved?

Dr. Souryal: Elaborating on the bone structure theory, at the end of your thigh, there's a notch called the intercondylar notch. Housed within this notch are the two cruciate ligaments, the anterior and posterior, which form an 'X.' Those who have a narrow intercondylar notch have a predisposition that makes them 26 percent more likely to suffer an ACL injury. One study actually showed a 66 percent greater risk.

Why this is so, we still don't understand. We don't know whether a narrow notch actually transects the ACL; we don't know whether a narrower notch houses a smaller ACL (an ACL that didn't have a chance to fully grow because of the bone surrounding it).

Regardless of what actually goes on in the notch, this is a simple X-ray study and it shows that those with this bony structure are at greater risk. Women have a narrower notch than men, which may sound obvious, but proportionately, it's even smaller than would be expected. Maybe this is one of the factors that predispose women to this injury.

One of the other factors that may prove to have a greater role than we anticipated is that of neuromuscular coordination. Your muscles must fire at precise moments and in perfect synchronization in order to walk, run or rebound. If this precision does not occur, then instead of the muscles taking the brunt of the movement in, for instance, a sudden change of direction, the ligaments and bones absorb the impact.

For whatever reason, women do not seem to have this neuromuscular precision developed to the extent that males do. It might be hormonally mediated, because young men have testosterone and this plays a vital role in muscular development. Or it could be that boys tend to begin playing sports from the time they are very young and girls tend to start later. Whatever the reason, it's a theory although at this time it's probably the leading one.

Do women have higher rates of other injuries?

Dr. Souryal: I don't think that the overall injury rate for women in sports is any higher than it is in men. This leads us to believe that there is something specific about the ACL. Maybe the fact that because the ACL is one of the few structures involved in change of direction movements combined with the decrease in 'protective' neuromuscular control leads to more ACL injuries than any other.

The only other area where neuromuscular control might be a factor would be ankle sprains, but I'm confident that ankle injury rates are the same for men and women.

In short, no one knows for sure why women injure their ACL at twice the rate of men. I'm sure it's multi-factorial and there are probably four or five causes. The structure of the knee is one, the wider hip angle of women may be one, the notch may be one, neuromuscular coordination may be one. If it were one of these in isolation, then we would expect men who have the same finding to have the same rate of injury, and this is not happening.

Can women do anything to decrease their chances of ACL injury?

Dr. Souryal: I tell my patients that flexibility, strength and endurance are crucial and so is common sense. If you're playing a sport you've never tried before, don't go out and try 110 percent. If you are not used to doing a 360-degree lay-up, certainly don't do it when you're tired. As far as flexibility is concerned, people stretch before and after activity, but sometimes not during a time-out or halftime. Strength and endurance are vital. Not only do you have to have the power in your legs to jump for a rebound, you also need the endurance to play for the entire 60 minutes, because the second half is when

you see trouble.

These are things in your control. Also, there are certain shoes that are a bit more dangerous than others, especially cleats. In a study on grass fields, longer cleats were far more dangerous than shorter ones. This is an issue for women playing soccer. Right now, unfortunately, there is no brace that you can slip on to prevent ACL injuries.

What about rehabilitation?

Dr. Souryal: Personally, I've done over 1,000 ACL surgeries over the years and I have not noticed a difference in recovery rates in men and women. I have noticed that women tend to be more consistent and persistent in their rehab than men. I am always more confident that a female athlete will take her rehabilitation more seriously than her male counterpart.

Dr. T.O. Souryal , a member of [Professional Team Physicians](#), was formerly a team physician for the Dallas Mavericks. Dr. Souryal received his medical degree from the University of Texas Health Science Center in San Antonio and completed a fellowship at Hughston Sports Medicine Clinic, Columbus, Ga. Dr. Souryal also is Medical Director at Texas Sports Medicine and is director of the Sports Injury Clinic at SMU.

Disclaimer:

The information, including opinions and recommendations, contained in this website is for educational purposes only. Such information is not intended to be a substitute for professional medical advice, diagnosis or treatment. No one should act upon any information provided in this website without first seeking medical advice from a qualified medical physician.

ESPN.com: [Help](#) | [Sales Media Kit](#) | [Report a Bug](#) | [Contact Us](#) | [Site Map](#) | [Jobs at ESPN](#) | [Supplier Information](#) | Copyright ©2006 ESPN Internet Ventures. [Terms of Use for our Site](#), [Terms of Use for ESPN Motion](#) and [Privacy Policy and Safety Information/Your California Privacy Rights](#) are applicable to you. All rights reserved.