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Girl athletes at risk for serious knee injury: NJ experts share secrets to prevent ACL tears

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(Photo: Doug Hood)

Allison Waznor heard a pop in her knee and then felt a sharp, excruciating pain.

The Jackson Memorial High School senior, then a 15-year-old on the soccer field, extended her left leg to get her foot on the ball, but her knee jammed after her foot hit the ground. Despite the pain, Waznor felt she had dodged a major injury.

She was wrong.

"I heard a popping sound, so I went down, and it hurt a lot," said Waznor, now 17, who also plays basketball for the Jaguars. "I cried a little, but then I got up and about 20 minutes later, I thought, 'Oh, this isn't that bad.' The next day, I woke up and couldn't really bend or straighten my leg, and that's pretty scary."

Need to know how to avoid ACL tears? Here is some advice (<https://www.app.com/story/sports/high-school/basketball/2018/02/09/knee-injury-prevention/321078002/>)

Waznor had torn a critical part of her knee, the anterior cruciate ligament, or ACL. Those three letters are a dreaded acronym to hear if you're an athlete; a torn ACL is a devastating injury that can take up to a year to recover from. It's a sports injury that has grown in frequency in the last couple decades -- especially among female athletes.

Girls and women in sports have a 2 to 9 times greater risk of non-contact ACL injuries than males, or an average of 3.5 times greater risk, [according to the National Center of Biotechnology Information \(http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3702781/\)](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3702781/).

In soccer and basketball, ACL injuries are approximately three times higher in female athletes than males, according to a 2013 study in the Journal of the American Academy of Orthopaedic Surgeons. It cited an analysis which found a female to male injury ratio of 2.67 in soccer, 3.5 in basketball and 4.05 in wrestling.

"It's always in the back of your mind as a coach," Rumson-Fair Haven girls basketball coach Dave Callahan said. "We have an excellent trainer, Alex Sten, and a great strength and conditioning coach, Rob Orrok, and we all work together to try to build strength in the legs and the knees. It's strange, but the injuries I have seen have really just been an awkward planting of the foot, and then the knee goes. It's frustrating and tough on these kids."

It is estimated that more than 120,000 ACL injuries happen each year, with most occurring in the high school years, according to a 2016 report in the American Journal of Sports Medicine. Most ACL injuries -- 70 to 78 percent on average -- are non-contact injuries, according to the American Orthopedic Society for Sports Medicine.

Dr. Gregg Foos, a Toms River orthopedic surgeon who specializes in sports medicine, says the injury usually happens when the knee twists awkwardly after motions like landing from a jump or quickly changing direction while running.

"Typically, it's what we call a deceleration, changing direction, twisting type injury," Foos said. "You're trying to stop and change direction at the same time and classically, people will feel a pop in their knee, and then their knee blows up like a balloon."



Jackson Memorial senior Allison Wanzor tore her ACL playing soccer last season. (Photo: Pete Akerman)

WHY YOUNG, FEMALE ATHLETES ARE AT GREATER RISK

The Shore Conference is full of scarred knees.

On any given night on the basketball court, a player can be seen with a bulky, black brace protecting the knee. Wanzor and Toms River North guard Brielle Bisogno tore their ACLs last season. Rumson-Fair Haven senior Mikaela McGarvey made her season debut on Feb. 6 after tearing her ACL in July and missing the first 19 games this year.

Middletown South alone has three players who have returned this year after suffering major knee injuries.

The risks of tearing an ACL seems to be widely known by parents of young athletes. Schools send out general injury waiver forms to be signed by an athlete's parents, but even if those forms don't specify about ACL injuries, most parents know the risks of playing sports.

"You wouldn't have your daughter out there if you didn't understand the risks," said Joe McGarvey, father of Mikaela McGarvey. "The form is a formality. The school makes you aware of the physical nature (of the sport) and that this is your waiver claiming any kind of legal standing against the school. It's more legal than it is a physical warning."

In fact, most parents inside girls basketball communities are aware of a female athlete's risk of tearing their ACL, he said. They know that their children could get seriously hurt, but that's the nature of sports.

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(<https://www.app.com/story/sports/high-school/2018/02/02/am-sport-award/1048527001/>)

"No doubt about it, it's pretty well known in basketball circles," Joe McGarvey said. "You talk to enough parents and travel with parents who know girls who had knee injuries. It's known that girls are more prone to this ACL or knee injury as opposed to boys who play similar sports."

But why do female athletes tear their ACLs at a much higher rate than male athletes? And why are they tearing their ACLs at such a young age?

Medical professionals believe it's a combination of biology and circumstance. Foos said the female body is susceptible to an ACL tear because women naturally have wider hips than men, so their knees come together at more of an angle. The "knock-knee" form puts an athlete at a greater risk because their knees are at an angle that is ideal for a tear, according to Foos.

It's also the way women carry themselves. Dr. Bruce Stamos, an orthopedic surgeon from Brick, says that women tend to run more upright and favor their quadriceps, the muscles on the front of the thigh, more than their hamstrings. The quads pull the shinbone forward, which puts stress on the ACL.

When females typically land from a jump or make a quick cut to change direction, moves that can easily cause ACL tears if done awkwardly, they do it with their legs straight rather than bent. That too can rupture the ACL.

“Biomechanically, they do things a little differently than males, and they tend to keep their legs straight, which is a position that most of these injuries occur,” Stamos said. “When you’re landing from a jump or cutting with your leg bent, you can dissipate all the energy through your knee with it flexing, but if it gets stuck straight, it just folds inward, and that’s it. A little bit of rotation and the ACL gives out.”



Rumson-Fair Haven senior Mikaela McGarvey (3) returned to action on Feb. 6 after tearing her ACL last year. Noah K. Murray-Correspondent/Asbury Park Press ASB 0307 NJSIAA Girls Hoops RDP (Photo: Noah K. Murray, Noah K. Murray-Correspondent/Asb)

Foos also says there are studies that conclude a female’s menstrual cycle can play a role. The estrogen in the female body at certain points of their menstrual cycle can make the ligaments in the body laxer and become more prone to injury.

Females are also playing more sports than ever before. Since the implementation of Title IX in 1972, female participation in sports has skyrocketed from one in 27 to now two in five, according to the Women’s Sports Foundation. In addition, sports like basketball are often played year-round by the athlete.

However, it’s important to note that playing throughout the year by itself does not increase the likelihood of an ACL injury because of added strain or wear and tear, Stamos said. Playing the sport all year simply provides an athlete more opportunities to tear their ACL.

“It’s more the exposure, it’s not a repetitive or overuse injury, it’s just a freak thing,” Stamos said. “When it happens, it has to do with biomechanically how the knee is loaded. It may have to do with fatigue a little bit, but it’s more about the encounters.”

PREVENTION

What’s most menacing about an ACL tear is that the factors that cause the injury are generally biological and can’t easily be prevented.

“I like to say risk reduction because I do think we can lower the risk, but when talking about reducing the risk of this ACL injury with females, it’s just so tough when the number one risk factor of tearing your ACL is just strictly being female,” said Sharon Wentworth, a doctor of physical therapy at Elite Sports Physical Therapy in Tinton Falls. “Obviously, we can’t do anything about that. There’s all the hormone changes and how we’re built skeletally and our wider hips, all this stuff that we can’t do anything about. As an industry, we really have to recognize what we can do to lower the risk.”

But that doesn’t mean that there aren’t steps athletes, coaches and schools can take to help reduce the number of ACL injuries.

[Girls Hoops: State tournament seeds, pairings released](https://www.app.com/story/sports/high-school/basketball/2018/02/08/girls-hoops-state-tournament-seeds-pairings-released/320336002/)
(<https://www.app.com/story/sports/high-school/basketball/2018/02/08/girls-hoops-state-tournament-seeds-pairings-released/320336002/>)

What athletes can do is change how they play. There are many sports performance companies in existence that teach athletes how to land properly and how to make a cut in the optimum way. This way, an athlete can minimize the risk of tearing their ACL.

The NJSIAA is also making an effort to keep its athletes healthy. The athletic association has led seminars and workshops for high school athletic trainers throughout the state in an effort to educate them in proper prevention techniques; however, the NJSIAA has not made such prevention techniques mandatory.

Still, an ACL tear is an injury that even the most well trained professional athletes suffer from. An athlete might soften their landing or bend their knee more when they make a cut, but the risk will never truly disappear. At this point, it's all about minimizing that risk as much as possible.

"Our hope is that we improve their muscular balance and their movement patterns so that when they're out on the field, it comes naturally to them," Wentworth said. "We don't want them thinking, 'Now I need to land, and I need to land soft and not let my knee go in.' That can't happen in a game. Our hope is we improve movement patterns with proper training and that it decreases their chance of putting their bodies in a position where their ACL is torn."

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Middletown South junior Eve Pirie made a full recovery after an ACL injury sidelined her for a portion of her sophomore campaign. (Photo: Doug Hood)

THE SURGERY AND REHAB

The practice of surgically repairing a torn ACL has come a long way. Back in the 1980s, surgeons worked on the injury through a massive, open-knee procedure, and tried to essentially re-connect each strand of the torn ligament.

The ligament may have the elasticity of a rubber band, but it certainly doesn't tear like one, according to Foos. Instead of a clean snap that can easily be sutured back together, when an ACL tears, it breaks in a much more complicated and messier fashion.

"When it tears and you look at the ends of it, it looks like two ends of mop or a rope that's frayed and come apart," Foos said. "There's a lot of different strands, and those strands are very difficult to put back together and mend in such a way that they create the normal tension."

Today, surgeons use an arthroscopic operation that needs only a couple small incisions. Instead of putting the loose strands back together, surgeons take a new piece of tissue, typically from elsewhere in the patient's body or a cadaver, and use that to reconstruct the ACL.

"We've got a technique that works well for the vast majority of people," Foos said. "Ninety-plus percent of people who have the surgery can get back to playing sports and can get back to doing all the things they normally do without having an unstable knee."

Because treatment has advanced so much over the years, athletes who do suffer from a torn ACL typically can return to their respective sport. Players like McGarvey who tear their ACL typically seem more than eager to return to athletics after the injury.

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Toms River North junior Brielle Bisogno (L) missed her entire sophomore season with a torn ACL. Bisogno is averaging 12.0 PPG this season. (Photo: Doug Hood)

"Ever since the day I tore it, I've been waiting to get back," Mikaela McGarvey said. "It was pretty tough, but I learned to take from the small victories. Bending my leg a certain degree or being able to run without feeling like I'm about to pass out. It was tough, but overall definitely I feel it was worth it. I feel stronger and more confident than I ever was."

An aggressive rehabilitation process begins almost immediately after surgery, usually between three and seven days after the operation. Wentworth says that an accelerated rehab program that lasted about six months used to be the norm, but upon further study, the medical community has discontinued the arbitrary six months and taken a slower approach. Rehab typically takes anywhere from nine months to a year depending on the patient.

"We feel like it's taking braces off early, it doesn't make much sense, you need to wait until your teeth are straight before you take them off," Wentworth said. "We keep our athletes all the way until they're ready to either transition to sports performance training or clearance of athletics."

The physical rehab is certainly arduous, but the psychological rehab may be tougher. A young athlete, after suffering a devastating injury, has to regain trust in their knee. They have to believe that their knee will not blow out again.

"I knew that if I wanted to play sports, I had to trust my knee," said Bisogno, the Toms River North guard who tore her ACL last year. "I had the brace on, so I had to trust that it would keep my knee in place. I was kind of scared to take it off. That's when I was like, 'oh God.' I felt like when I moved, I had to be careful, but as practices began and I played in games, it got better each day."

It's a hurdle that does not go unnoticed or ignored by modern physical therapists. Wentworth firmly believes that it's incumbent on the physical therapist to create an ideal environment for her young patients so they don't feel alone and ostracized from their team during the recovery process.

"The hardest thing is they really don't have the coping methods to deal with such a big surgery and a big injury," Wentworth said. "They're being forced to cope with this with a very young, teenage brain. It's really important for us as physical therapists to provide them with the silver lining of this injury, and that's they're going to come out on the other side of this rehab stronger, faster, better balanced, mentally tougher and a better athlete."

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