



December 2023

Understanding ACL tears and available treatment options.

By: Ryan Murray, MD, Pediatric Orthopaedics and Sports Medicine, Jeremy Dockter, ATC, and Randy Toth, PT

Young athletes know that sports injuries can quickly derail their competitive seasons. As kids increasingly specialize in one sport year-round, and at younger ages, the incidence of injuries is rising. This is especially true for ACL tears, which are common knee injuries that occur in middle and high school athletes. A torn ACL often requires surgery and up to a year for full recovery, which is why coaches, athletic trainers, physical therapists, parents, and athletes work to minimize the risk of an ACL injury by ensuring a proactive and balanced approach to training.

The information that follows is intended to highlight the importance of ACL prevention through an integrated approach between parents, coaches, athletic trainers, physical therapists, and physicians while also providing information on the treatment of ACL injuries should this unfortunate event occur.

What is the ACL and how does it tear?

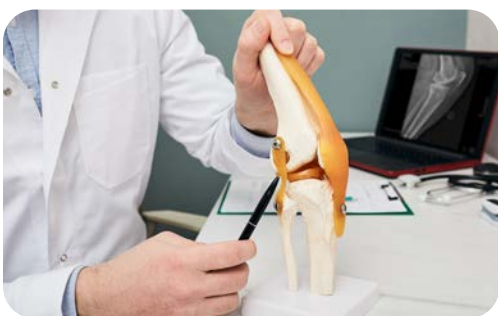
The anterior cruciate ligament (ACL) is one of four small, but important, ligaments in the knee that are essential for joint stability, especially while playing sports. The ACL connects the shin bone (tibia) to the thigh bone (femur), working to prevent the shin bone from sliding forward and the knee from abnormal rotation. The fibrous band of tissue is what allows the body to safely run, pivot, and land a jump.

A sudden change in direction or an awkward takeoff or landing from a jump may cause you to plant your foot and over-rotate your knee, resulting in a torn ACL. This can be life-altering as a young athlete, as treatment typically involves surgery and recovery lasts nine to 12 months. While the injury is physically painful, it can also take a toll on a young athlete's mental health as they feel left out from the team or worse, the injury could affect aspirations of playing at the collegiate level. Left untreated, a torn ACL can also lead to other injuries in nearby ligaments, cartilage, and meniscus. Long-term, individuals who suffer ACL tears are more likely to develop early-onset degenerative knee osteoarthritis, which may lead to chronic pain.

Many ACL injuries occur in athletes who play sports that involve sharp pivots, such as soccer, basketball, football, lacrosse, and skiing. While ACL tears are frequently sports-related injuries, they can also occur more subtly while less vigorous activities. Many people with a torn ACL feel or hear a "popping" sensation in the knee at the time of the injury and feel immediate pain and swelling. Aside from discomfort, an ACL tear may limit your range of motion and stability which makes it hard to walk, run, or jump.

It is important to note that young, female athletes are two to eight more times as likely to experience an ACL tear than their male peers. There's no one reason for this, but it may be attributed to their biology, hormonal differences, and/or muscular imbalance.

Diagnosing an injury



When a young MCPS athlete sustains a knee injury, particularly during a sporting event, they are generally first evaluated by their school's certified athletic trainer. Based on their assessment, patients with concern for ACL injuries are referred to one of our fellowship-trained sports medicine physicians. The physician will evaluate the athlete, perform a physical exam, and may order additional tests such as X-rays and/or an MRI scan. The combination of these tests will help the physician arrive at the diagnosis and determine the next steps in treatment. It is important to note that not every knee injury results in an ACL tear and other diagnoses such as strains, sprains, cartilage, or meniscal injuries are also common. Based on the diagnosis, the physician will then work with the athlete



and their family to determine the optimal treatment going forward, either nonoperative or operative. Either path will almost certainly involve the expertise of our sports physical therapists who help patients rehabilitate following injuries and surgeries to ultimately get our athletes back on the field. Together, through collaboration and communication between the physician, athletic trainer, and physical therapist along with the patient and their family, we're committed to providing our MCPS student athletes with world class care

Treatment options

ACL tears can't always be prevented, and if you do sustain an ACL injury your physician will talk with you about the available treatment options. There are both non-surgical and surgical options for ACL tears, both of which involve rehabilitation with physical therapy.

Depending on your goals, some patients may not require surgical intervention to repair or reconstruct your ACL. In this situation, an abbreviated bout of physical therapy will be conducted to restore joint range of motion, increase strength, and proprioception. Discuss with your sports medicine physician if you are an appropriate candidate for conservative management of this condition.

For young, competitive athletes who desire to return to sport, surgical treatment with an ACL reconstruction is often recommended.

Fortunately, ACL reconstruction is an effective way to replace the torn ligament and get back to your sport in time. It can be hard to sit on the sidelines after surgery, but returning to your sport too soon significantly increases the risk of a re-tear. Most adolescents need nine to twelve months to fully recover and get back to competition.

There are nuances to surgical ACL reconstruction, therefore, it's important that patients seek care from a sports medicine specialist with experience treating patients with ACL tears. Considerations in treating ACL tears include graft choice as well as the treatment of co-existing injuries such as meniscal tears. Generally, surgeons will use the patient's own tissue to reconstruct the ACL, deciding on patellar tendon, quadriceps tendon or hamstring tendon through shared decision making with the patient and their family. Meniscal injuries commonly occur with ACL tears and your surgeon will discuss the treatment options for these injuries, including repair, which is performed at the time of the ACL reconstruction.

Prehabilitation

Prior to ACL surgery, your medical provider may prescribe "prehab" or "pre-rehabilitation." This is simply a brief bout of physical therapy prior to surgery aimed to ease concerns, educate, and restore function. Prehab is helpful to decrease pain, decrease swelling, and restore motion. Additionally, valuable information is provided regarding usage of assistive devices, transfers, and surgery preparation. You will further participate in an exercise regimen which will provide a better understanding and expectations for postoperative exercises.

If the thought of having ACL surgery is overwhelming, discuss "pre-hab" with your medical provider.

Recovery

Immediate Post-op:

ACL surgery is done on an outpatient basis. This means that you will return home the same day of the surgery. Immediately after surgery you will likely experience varying degrees of pain, swelling, and disability. Patients are placed in a knee immobilizer and will be utilizing crutches to facilitate ambulation. Weightbearing status will depend on the specifics of your surgery. Your physician will guide you to when it is appropriate to start physical therapy. The post-operative rehabilitation of an ACL reconstruction is challenging. Patients are oftentimes out of school for at least a week and start physical therapy shortly after surgery. The physical therapist will work with the patient through a rehabilitation protocol, in collaboration with their surgeon and athletic trainer, to regain range of motion, strength and ultimately sports specific function. Since it takes nine to 12 months for the ACL graft to heal as a ligament this can be a long process which takes patience and diligence with rehabilitation. As recovery progresses, I encourage patients to take the time to cross-train, whether that's cardiovascular exercise or weight training. The work you put into your health will pay off when you return to your sport injury free. While you may not be able to participate in practices or games during recovery, I encourage my patients to attend team practices and events so they can be around the team and benefit from the camaraderie. It is important that ACL patients know they are not alone in the post-operative recovery process, in addition to their family and friends, the team of healthcare providers, physicians, physical therapists, and athletic trainers are all dedicated to helping young athletes recover from these injuries and ultimately return to play.



Prevention

Strengthening the muscles of the thigh (quads, hamstrings, and adductors), hips (glutes and hip flexors), and core are paramount to reducing the risk of an ACL injury. Exercises like squats, lunges, Romanian deadlifts, bridges, and planks are easily worked into strength training program or work out plan and can help strengthen these important muscle groups. And by emphasizing little aspects and components of these exercises we can better train our body to be ready for the forces that cause ACL tears.

For example:

- Focus on keeping the knee in line with the toe when doing squats or lunges, as the inward (valgus) knee movement can put strain on the ACL.
- Try to perform the lowering down part of hamstring exercises (deadlifts, curls, etc.) slowly to increase their eccentric strength, as this helps decelerate you when coming to a stop from running.
- Use a band around your knees when performing bridges to better activate your glutes, and make sure to engage your abdominal muscles when bridging up.

In addition to strengthening the muscle groups, it is important to train the sense of where and how our body is positioned in space, otherwise known as proprioception. Proprioception can be thought of as the connection between our brain and our limbs, and specifically in this case, our legs. Training proprioception is really just working on our balance. We have all probably seen videos of athlete performing some wild exercise while standing on a Swiss ball, but we can train our balance just as easily on the ground. Standing on a single leg, with a slight bend in the knee, and holding that motion for one minute, is a starting spot for proprioception training. When this gets easy, you can make it more difficult by closing your eyes or covering your ears. Or you can stand on an unstable surface like an Airex pad or a Bosu ball. You can add in aspects of your sport, like hitting a ball with a racket or playing catch. Training proprioception allows our bodies to be more in tune with its positioning in space and better at reacting to the forces that try and displace it.

Finally, training the mechanics of landing and cutting can help prevent ACL injuries by better preparing us when we start playing our sport. For example, you work on landing from a jump by stepping off a stool or plyometric box and focusing on squatting into it and keeping your knee in line with your toes. Practice making cuts while doing a slow jog and focus on activating your glute to prevent our knee from bending inwards. By slowing these movements down and working up to doing them fast, you can focus on the details to do them correctly. Hopefully, by practicing it becomes second-nature when you are playing your sport.

Our commitment

While no young athlete wants to suffer an ACL tear, this injury unfortunately occurs frequently. MedStar Health and Montgomery County Public Schools, through an innovative collaboration, are working hard to prevent these injuries with appropriate training, providing referrals for evaluations by one of our sports medicine physicians, and rehabilitation through our network of physical therapists located throughout the community. This collaborative approach between athletic trainers based in the schools along with physicians and physical therapists located in your community helps us provide high-level, integrated care for student athletes with ACL and other sports related injuries in the same way we care for athletes at the collegiate and professional levels.