

# ACL Injuries

## The ACL (anterior cruciate ligament)

The ACL is the ligament that connects the femur (thigh bone) and tibia (shin bone) inside the knee joint. Ligaments are tough, non-stretchable fibers that hold bones together. The ACL, along with the posterior cruciate ligament (PCL), medial collateral ligament (MCL), and menisci (cartilages), helps keep the knee stable and helps protect the knee from shifting, rotating, and hyperextending during running, jumping, or landing.

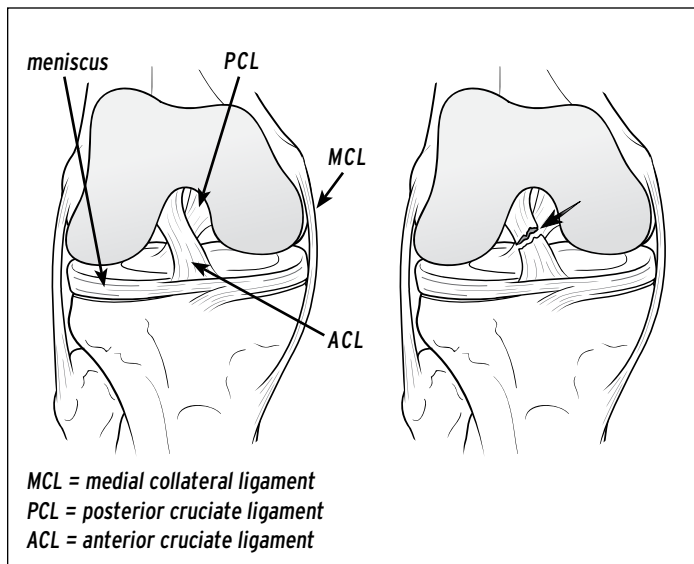


Diagram of ACL before and after a complete tear.

## Symptoms

ACL tears can occur from forceful contact to the front or outer part of the knee or from the knee twisting or hyperextending. An ACL tear is usually associated with sudden knee pain and a sense of the knee giving way. Commonly, those with an ACL tear feel a “pop” in the knee when they are injured. Swelling often occurs within 24 hours. While there may be pain, restricted motion, and a feeling of looseness in the knee, some individuals with ACL tears will have only minor pain, swelling, or limitation of weight-bearing activity. Some athletes with an ACL tear may be able to walk or run even though their injuries may be serious.

When the ACL is torn, it is common to also have injuries to the MCL and meniscus. The symptoms of an MCL sprain or torn meniscus may be more pronounced than the symptoms from an ACL tear alone.

## When to seek medical care

Athletes should seek medical care if they have a knee injury with a pop, swelling within 24 hours, restricted knee motion, or instability in the knee. Inability to run, jump, pivot, or change directions should also warrant medical evaluation.

## Playing with a torn ACL

Athletes who play sports that involve contact, twisting, jumping, and cutting motions, such as football, soccer, and basketball, are usually unable to continue their sport with an ACL tear. Attempts to continue to play with an ACL tear can result in further injury to the cartilage and meniscus. The combination of knee instability and cartilage damage can lead to development of premature arthritic changes. Athletes who participate in low-impact, non-pivot sports, such as bicycling or swimming, may be able to continue their sport with a torn ACL.

## Tests

Magnetic resonance imaging (MRI) is the best test to confirm a suspected ACL tear and to check for other injuries such as a torn meniscus. ACL tears cannot be diagnosed with x-rays. However, in children who are prepubertal or whose bones are still growing, an x-ray may reveal a fracture at the attachment site of the ACL. For best recovery, this type of fracture should be found and treated within 7 to 10 days of the injury.

## Treatment

Treatment for ACL tears depends on the age of the athlete and the sports that the athlete plays. Conservative treatment includes activity modification, rehabilitation exercises, and bracing during activity. Surgical treatment involves creating a new ligament from a tendon in the patient’s knee or from a tissue donor. Surgery is ideally done after the athlete has recovered from the effects of the initial injury. If the knee is still swollen, stiff, or weak at the time of surgery, any benefits from early surgical treatment will be lost by delays in surgical recovery.

Young athletes may choose to hold off on surgery until their bones are finished growing to reduce the risk of growth plate injury from the surgery. New surgeries are being developed to avoid this. Most athletes who

participate in running, jumping, pivoting, or contact sports are likely to need surgery to continue playing their sports. With proper surgical treatment, about 90% of athletes are able to return to their sports at approximately 6 months after surgery.

### Prevention

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While any athlete can tear the ACL, the targets for prevention efforts are female athletes and athletes in jumping, pivoting, and collision sports such as soccer and basketball. Females have been reported to have a 4 to 8 times greater risk of ACL injury than males playing similar sports. ACL prevention programs have been developed that address running, jumping, and landing techniques as

well as hip, core (trunk), and hamstring strengthening. Knee braces for athletes in sports such as football are ineffective at significantly reducing ACL tears.

### For more information

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Santa Monica Orthopaedic and Sports Medicine  
Research Foundation  
[www.aclprevent.com/aclprevention.htm](http://www.aclprevent.com/aclprevention.htm)

Cincinnati Children's Hospital Medical Center  
[www.cincinnatichildrens.org/svc/alpha/s/sports-med/acl.htm](http://www.cincinnatichildrens.org/svc/alpha/s/sports-med/acl.htm)

### NOTES

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