



# KNEE INJURIES

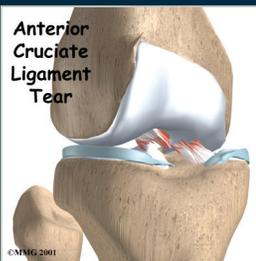
## Anterior Cruciate Ligament Injuries and Recovery

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### What is an Anterior Cruciate Ligament (ACL)?

The ACL is located within the center of the knee joint, attaching the femur (thigh bone) to the tibia (shin bone). It functions to stabilize the knee especially during pivoting and athletic activities.

An ACL tear is the most common, serious knee injury. Injuries range from a mild sprain to a complete ligament tear. It is estimated that over 100,000 ACL reconstructions are performed annually in the United States.



A knee without a functioning ACL is subject to instability or “giving out” during pivoting activities. Patients experience instability events when the knee gives out, often times resulting in swelling, pain, stiffness, and potential further injury to the knee. Such recurrent instability events can damage the knee and lead to early degenerative joint disease, or osteoarthritis.

### How do ACL injuries occur?

Seventy percent of ACL injuries occur during a noncontact, pivoting type activity, frequently occurring during athletic endeavors. This type of injury is common in football, soccer, skiing, basketball and other sports with frequent jumping, cutting, and stop-and-go demands. A slip on ice and a fall from a ladder are also commonly reported injuries. The ACL can also be torn when a direct blow is sustained to the front or side of the knee, such as being tackled during athletic competition.

### Who is at risk for an ACL injury?

Football, basketball, skiing, and soccer are high risk sports for ACL injury. Footwear and the type of playing surface also play a role in ACL injuries. The more grip an athlete’s foot has to the playing surface the more at risk that athlete may be for an ACL injury. Most ACL injuries occur between 15 to 45 years of age. Females are two to eight times more likely to sustain this injury than males. There are multiple reasons for this discrepancy, though the

most important factor in female injuries is lack of proper leg and knee control when jumping and landing. With proper training, the female risk factor can be significantly reduced.

### How do I prevent an ACL injury?

Many successful ACL injury prevention programs have been developed. These programs emphasize proper warm-up before athletic activity, injury awareness, and proper athletic technique and form. Lower extremity and core strengthening are important components of these programs in addition to stretching and plyometric/jumping exercises. It has been shown that the incidence of ACL injuries can be significantly decreased in athletes involved in injury prevention programs. In fact, these programs can reduce the risk of a female ACL injury to equal the risk of a male injury.

### How is it diagnosed?

ACL injuries are diagnosed with a careful clinical evaluation by your doctor. This evaluation includes asking questions about your health history and knee injury, examining your knee, and obtaining radiographic images of your knee. Patients who experience an ACL injury often report that the injury resulted from a twisting or pivoting type activity; it was associated with a “pop” in the knee and followed by pain and swelling. A physical exam includes a check for stability, range of motion, and tenderness in both the injured and uninjured knee. X-rays should be obtained to assess

knee alignment and identify fractures and other damage to the knee bones and joint. An MRI (magnetic resonance imaging) is often obtained to verify the diagnosis of an ACL tear and identify any other damage to the knee including bone bruises, cartilage injury, or other ligament tears.

### How is it treated?

Initial treatment for an acute knee injury should involve the RICE method. (The letters stand for Rest, Ice, Compression, and Elevation.) The initial treatment goals for an acutely injured and inflamed knee is to reduce inflammation, decrease swelling, and provide pain control. A brace and crutches may also be helpful to immobilize the knee and assist with ambulation for a few days or even weeks following the injury. Once pain is controlled and swelling has decreased, it is important to regain full knee range of motion. This can often be accomplished with a simple home exercise program though assistance from a trained physical therapist may be required.

There are two ways to treat ACL injuries, with or without surgery. An evaluation by an orthopaedic surgeon will help make this decision. Non-operative treatment can be successful in the less active population or for those willing to modify their lifestyle accordingly. This treatment involves participating in a rehabilitation program and possibly using bracing to help prevent recurrent knee instability.

### Symptoms of an acute ACL injury:

- Feeling or hearing a “pop” at the time of injury
- Knee pain
- Knee swelling immediately or within a few hours of injury
- Limited knee motion or a locked knee
- A sense of knee instability or the knee buckling or giving out

Those that are interested in continued athletic activity or have had knee instability despite non-operative care are candidates for ACL reconstruction. ACL reconstruction involves replacing the patient’s torn ACL with new tissue that will restore knee stability. This surgery is an arthroscopic-assisted procedure that involves drilling tunnels in the femur and tibia at the sites of ligament attachment. The new tissue, or graft, is then passed through these tunnels and secured to the bone with metal, plastic, or bioabsorbable devices such as screws or buttons. Graft choice is an important decision to be made and should be discussed with your surgeon. Graft choices include tendons transferred from other parts of the knee (hamstring, patellar, or quadriceps), or cadaveric grafts from a donor.

Rehabilitation after surgery takes several months and patients work closely with physical therapists. Return to inline running typically takes 3 months after surgery and return to all sports is expected in 6 to 12 months. ■

## ACL injury prevention techniques emphasize:

- Warming up prior to athletic endeavor
- Proper athletic technique and form
- Injury awareness
  - Avoidance techniques
  - Stretching and strengthening
  - Jumping exercises
- ACL reconstruction graft selection:
  - Patellar tendon
  - Hamstring tendon
  - Quadriceps tendon
  - Cadaver tendon

