

## Patient Information: ACL Injuries

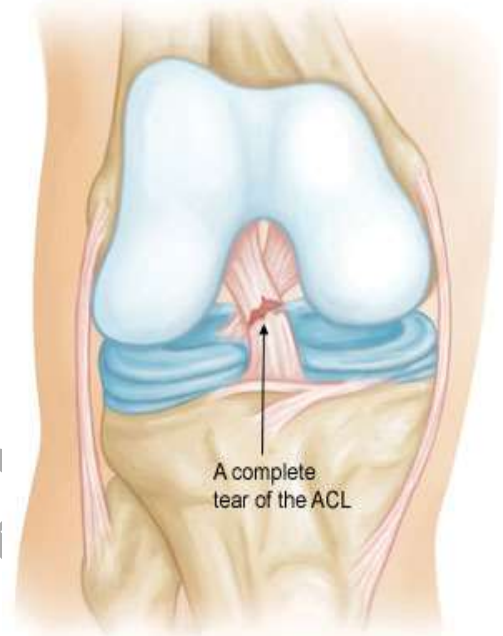
### Anatomy

Every joint in the body is lined by extremely smooth tissue called "articular cartilage." The articular cartilage of the knee coats the end of the femur (thigh bone), the top surface of the tibia (shin bone) and the back surface of the patella (kneecap). Bones are connected to other bones by ligaments. There are four main ligaments in the knee that keep the joint in place during motion: two collateral ligaments, and two cruciate ligaments.

The collateral ligaments (medial and lateral) are found on either side of the knee and prevent excessive side to side motion of the knee.

There are two cruciate (meaning 'crossed') ligaments that run inside the knee. The anterior cruciate ligament (ACL) runs in front of the posterior cruciate ligament (PCL). These ligaments primarily prevent excessive translation of the tibia in front of or behind the femur.

The ACL is the primary restraint of excessive anterior (or forward) translation of the tibia sliding in front of the femur during motion. It also has an important role in limiting abnormal rotation within the knee joint.



### What is an ACL tear?

This means the anterior cruciate ligament has been disrupted. Partial tears are very uncommon. Almost all tears are either complete or near complete tears. ACL tears usually occur at the top (femoral) attachment or in the middle of the ligament ('midsubstance tear'). Occasionally the ligament remains intact and a small piece of bone on the tibia where the ligament is attached to breaks off instead ('tibial spine avulsion'). This is more common in children and adolescents.

### How do you tear your ACL?

ACL tears usually occur after a twisting type of movement through the knee or a high energy forward translation of the tibia (shin bone) in front of the femur (thigh bone). Some of the more common scenarios this can happen are as follows:

- changing directions rapidly whilst running
- stopping suddenly or rapidly slowing down whilst running
- landing from a jump incorrectly
- Direct contact or collision such as football tackle.

There is a higher incidence in non-contact pivoting injuries in females. It has been suggested that this is due to a difference in physical conditioning, muscle strength, leg alignment and neuromuscular control between the sexes.

## What symptoms do you feel when you rupture your ACL?

When you first rupture your ACL, this is a painful and traumatic event. There is often an immediate swelling in the knee due to bleeding (haemarthrosis). There is often a popping sensation that can be associated with the knee giving way. The swelling and discomfort will settle over a few weeks however in the long term there can be the following symptoms:

- Episodic giving way
- Knee can often just feel "wrong"
- Joint line pain
- Discomfort when walking, especially on uneven surfaces
- Loss of confidence in the knee, especially when attempting sports that require rapid acceleration/deceleration or changing direction

## Can anything else be damaged?

Yes. Sometimes ACL injuries can occur in combination with meniscal tears, other ligaments or fractures.

## Diagnosis

Your doctor will take a thorough history and examination to assess for all the symptoms and signs associated with an ACL injury. As part of your workup, x-rays will be ordered to exclude other conditions in the knee such as a fracture which may occur in combination with an ACL tear. Additionally, you may undergo a test called an MRI (magnetic resonance imaging scan) which looks more specifically at the soft tissues within the knee, including the cruciate and collateral ligaments, menisci and the articular cartilage that lines the knee joint. This helps to exclude other associated injuries.

## How are ACL injuries treated?

This can vary depending on your individual needs. For example, the competitive athlete is more likely to require surgery to safely return to sport. A person with less demanding requirements and a knee that is not unstable during day-to-day activity usually does not require surgical intervention.

## Non-Surgical Treatment

A torn ACL will not heal without surgery. If the overall stability of the knee is intact, your doctor may recommend simple, nonsurgical options:

### Bracing:

Your doctor may recommend a brace to protect your knee from instability. To further protect your knee, you may be given crutches to keep you from putting weight on your leg

### Physiotherapy:

As the swelling goes down, a careful rehabilitation program is started. Specific exercises will restore function to your knee and strengthen the leg muscles that support it.

## Surgical Treatment

### Rebuilding the ligament

Most ACL tears cannot be sutured (stitched) back together. To surgically repair the ACL and restore knee stability, the ligament must be reconstructed. Your doctor will replace your torn ligament with a tissue graft. This graft acts as a scaffolding for a new ligament to grow on.

Grafts can be obtained from several sources. Often, they are taken from the patellar tendon, which runs between the kneecap and the shinbone. Hamstring tendons at the back of the thigh are a common source of grafts. Sometimes a quadriceps tendon, which runs from the kneecap into the thigh, is used. Finally, cadaver graft (allograft) can be used.

There are advantages and disadvantages to all graft sources. You should discuss graft choices with your own orthopaedic surgeon to help determine which is best for you. Because the regrowth takes time, it may be six months or more before an athlete can return to sports after surgery.

### Procedure

Surgery to rebuild an anterior cruciate ligament is usually done with an arthroscope using small keyhole incisions. Arthroscopic surgery is less invasive. The benefits of less invasive techniques include less pain from surgery, less time spent in the hospital, and quicker recovery times.

Unless ACL reconstruction is performed in combination with surgery for other ligament injury in the same knee, it is usually not done right away. This delay gives the inflammation a chance to resolve and allows a return of motion before surgery. Performing an ACL reconstruction too early greatly increases the risk of scar forming in the joint (arthrofibrosis), which would risk a significant loss of knee motion.

### What happens after surgery?

Whether your treatment involves surgery or not, rehabilitation plays a vital role in getting you back to your daily activities. A physiotherapy program will help you regain knee strength and motion.

If you have surgery, physiotherapy first focuses on returning motion to the joint and surrounding muscles. This is followed by a strengthening program designed to protect the new ligament. This strengthening gradually increases the stress across the ligament. The final phase of rehabilitation is aimed at a functional return tailored for the athlete's sport. The process of the new ligament growing through the scaffold created during surgery takes time. Talk to your doctor and orthopaedic surgeon about when it is safe to return to sport.

