

## What is the Anterior Cruciate Ligament?

The anterior cruciate ligament (ACL) is one of four ligaments which provide stability to the knee. The function of the ACL is to prevent excessive forward motion of the tibia (shin bone) with respect to the femur (thigh bone).

If the ACL has been torn, the knee is unstable—it is looser than it should be. Without the ACL present, you can have episodes when the knee gives out during pivoting or twisting activity. Thus, with a torn ACL, it is difficult to continue playing sports that involve twisting and pivoting. Furthermore, each time the knee gives out, damage can occur to the knee cartilage.

## What Types of Injuries Occur?

ACL tears are the most common knee ligament injury. Over 50,000 occur each year from skiing alone.

The ligament usually tears in the middle. Unfortunately, when this happens it does not heal back together. Sometimes the ligament pulls a small piece of bone off one end, and this will show up on routine x-rays.

The ACL can have a complete tear or a partial tear. Partial tears may not cause instability of the knee.

Other knee structures can be torn at the same time as the ACL:  
 The collateral ligaments on the outside of the knee—causing more severe instability of the knee.  
 The meniscus cartilage—the "shock absorbers" of the knee.

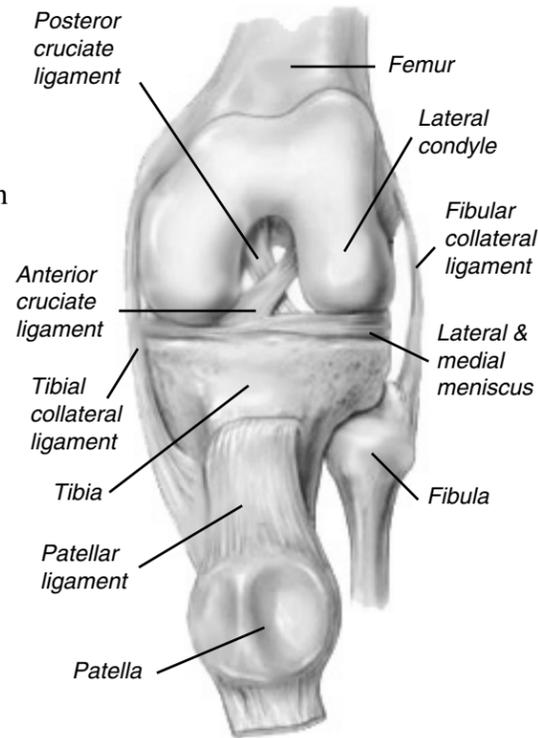
## Initial Treatment of an ACL Tear

Initially, there is a great deal of **swelling** in the knee which can be controlled with ice, anti-inflammatory medicine (aspirin or ibuprofen), and an elastic compression sleeve.

**Exercises** will be given to regain movement and strength of the knee. These exercises can be done at home, at school, or with a physical therapist.

Sometimes an **MRI** will be ordered to determine if the cartilage is torn. Usually the ACL tear can be diagnosed by examination, but sometimes a MRI is needed to confirm the ACL tear.

You will be followed closely by the doctor to be sure that knee movement is returning. If it does not, this may indicate that a piece of cartilage has torn and is trapped between the two bones. In this case, **arthroscopy** of the knee may be necessary to *repair* the cartilage.



## Reconstruction vs. Bracing vs. Activity Modification

In order to restore the normal stability of the knee, the ACL has to be surgically reconstructed. However, not everyone who tears their ACL should undergo this surgery. This decision is based on several factors:

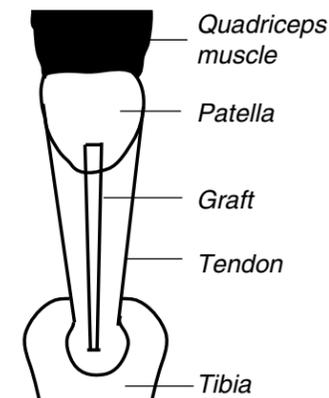
- Damage to other ligaments at the same time as the ACL may make the knee quite unstable, and ACL reconstruction may be important.
- If the knee cartilage needs **repair**, the ACL should be reconstructed to prevent re-tearing.
- If the knee cartilage has to be removed, this causes further knee instability, so the ACL may need to be reconstructed on that basis.
- If you can **modify** your activities to avoid pivoting and twisting, you may not need surgery. If you do these pivoting activities on an occasional basis, you may do fine wearing a custom brace. A brace will improve the stability of a knee, but will not give you normal stability.

## ACL Reconstruction Using Arthroscopic Technique

The physicians at MidJersey Orthopedics have special training to perform reconstruction of the ACL using an **arthroscopic technique**. This method does not require large incisions into the knee, so the success rate is higher, and the recovery proceeds much easier. The basic steps are as follows:

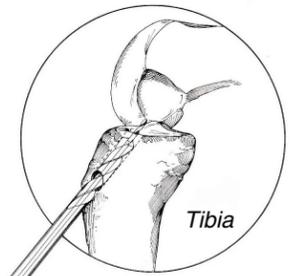
### STEP ONE

A piece of the patella tendon together with a small piece of bone from the kneecap (patella) and the shin bone (tibia) is obtained through a three-inch incision overlying the tendon, but this incision does not extend into the knee joint. The tendon graft is used to re-build the ACL. The gap in the tendon will fill in with new tendon tissue after the surgery.



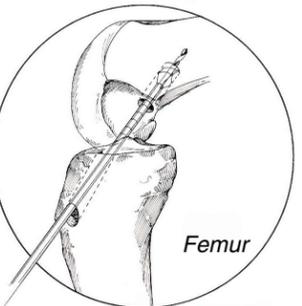
### STEP TWO

Through a tiny incision in the front of the leg, a hole is drilled in the tibia where the old ACL used to attach.



### STEP THREE

Working from the inside of the knee, a hole is drilled into the femur where the old ACL used to attach.

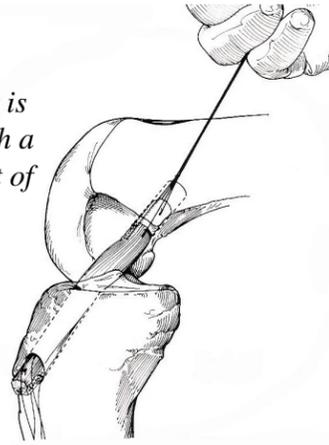


(continued)

## Reconstruction Continued

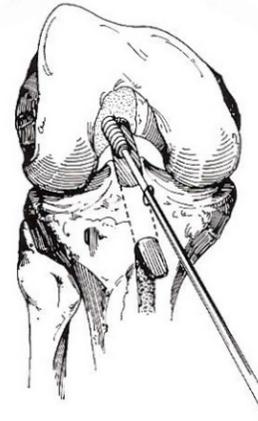
### STEP FOUR

*The patella tendon graft is pulled into place through a tiny incision on the front of the thigh.*



### STEP FIVE

*The bone plugs of the patella tendon graft are secured to the holes in the tibia and femur by small screws. Usually the screws are absorbable, but sometimes we have to use a metal screw.*



## Recovery After Surgery

*It takes over six months for the patella tendon graft to fully heal and turn into a new, strong ligament. During that time, you undergo a carefully-controlled program of progressive exercise.*

- The first week you use a knee immobilizer when you walk. When you are not weight bearing, this can come off for exercise. You may use crutches initially, but wean off them as tolerated.
- Full range of motion exercises start right away.
- You may start running at about 6-8 weeks.
- Within a few weeks you may start using a stationary bike, stair machine, cross-country skiing machine or rowing machine.
- You begin light pivoting and twisting activities at about three months.
- Exercises for the hip, thigh, and ankle begin right after surgery.
- Within a week you should be able to do desk work. After three to six weeks you should be able to do strenuous work.
- Return to full sports may begin at about 5-6 months, but it often takes 12 months or more to regain full confidence in the knee and to feel the knee is functioning 100%.
- There is no evidence that wearing a knee brace when you first return to sports will prevent reinjury. In fact, wearing a brace seems to inhibit the muscles from recovering their full strength.

## Success Rate

Not long ago, there was no procedure that could reliably reconstruct the ACL and allow full return to activities. For many athletes, a torn ACL was a career-ending injury. Our experience with the arthroscopic technique for ACL reconstruction shows that most patients (over 95%) end up with a stable knee that allows full return to activity. The ultimate result can depend on these factors:

- *Following the rehabilitation program accurately.*
- *Any concurrent injuries to other ligaments or cartilage of the knee.*
- *Any pre-existing knee problems.*

[www.midjerseyortho.com](http://www.midjerseyortho.com)



## Anterior Cruciate Ligament Injuries

Types of Injuries • Treatment Options • Rehabilitation



### Robert C. More, M.D.

*Orthopaedic Consultant  
Hunterdon County High Schools*

*Clinical Assistant Professor  
New Jersey Medical School*

*Member, American Orthopaedic Society  
for Sports Medicine*

**Patient Information Series**