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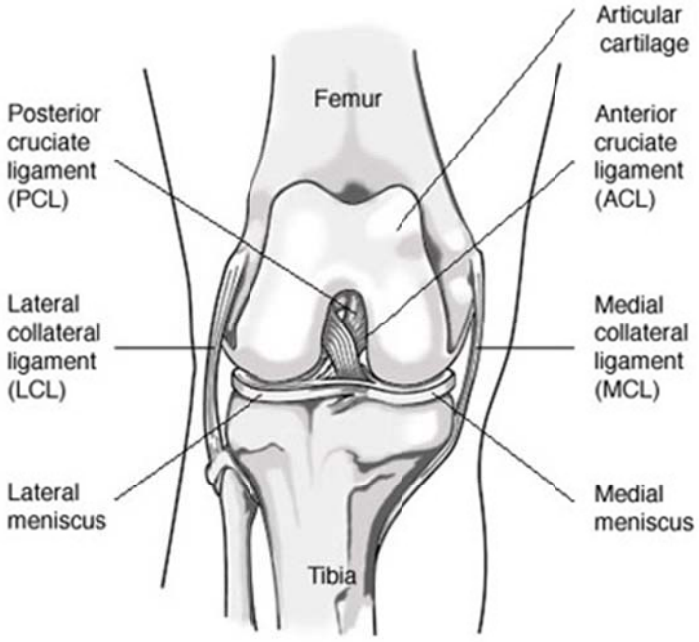
# KNEE:
## *Anterior Cruciate Ligament (ACL) Tears*

The Anterior Cruciate Ligament (ACL) is a main stabilizer of the knee. It keeps the tibia (shin) from moving forward on the femur (thigh) and also helps to prevent some rotation between the two bones. The ACL is essential for normal knee function in aggressive running, cutting, and jumping-type activities.




### *Associated Injuries*

Often, other structures in the knee are injured when the ACL is torn. Which structures are injured and to what degree influences the treatment and long-term prognosis for your knee.

- *Bone bruises* are present in 60-80% of ACL tears. They can cause a significant amount of pain on their own. This is worse with weight-bearing and may be a reason to use crutches.
- *Meniscal tears* are often associated with ACL injuries. These can occur at the same time as the ACL injury or from a separate instability episode after the ACL was torn.
- The *articular cartilage* can also be damaged at the time of an ACL injury or from another instability episode.
- Occasionally, one of the *other ligaments* of the knee is injured with the ACL. This makes the knee even less stable. It also can affect the timing of any surgery, how much surgery we recommend, and the rehabilitation after surgery.

***X-Rays***

X-rays of your knee are an important part of the evaluation if we suspect an ACL tear. They allow us to look for fractures, arthritis, malalignment issues, and injuries to the growth plate in younger athletes.

***MRI***

A Magnetic Resonance Image (**MRI**) is different from an x-ray because it allows us to see the soft tissues (cartilage, ligaments, and meniscus) around the knee. It also takes longer than an x-ray and can be troublesome for people who are claustrophobic. An MRI will help to confirm the ACL tear and look for associated injuries.

## TREATMENT

The goal of treatment for an ACL tear is to decrease pain and restore function. The treatment recommended by your doctor will depend on your age, the sports and activities you do, and the presence of other injuries.

In general, there are three treatment options for ACL tears:

1) **Non-operative management** (no surgery). For patients who have no other injuries, it is possible to do **aggressive physical therapy** to strengthen the hamstring muscles and help stabilize the tibia. **Bracing** to stabilize the knee and permanent **modification of your activities** to minimize the chances of instability and demands on the knee are also essential.

2) **Surgery** to clean up any associated meniscus tears or cartilage lesions. With this arthroscopic surgery the **ACL would not be reconstructed**. If this option is chosen, the overall rehabilitation after surgery is quicker. However, this still requires aggressive therapy, bracing, and permanent activity modification like the non-operative program above.

3) **Surgery to reconstruct the ACL**. This is generally our recommendation for younger patients and people who want to continue playing sports. We know that having an ACL tear increases the risk of developing knee arthritis. With each subsequent episode of instability or "giving way", the chances of damaging the menisci and articular cartilage increase. The idea behind ACL reconstruction and stabilizing your knee is to decrease the number of instability episodes and minimize further damage to the meniscus and articular cartilage.

ACL surgery is a significant undertaking and the physical therapy afterwards is extensive. ***It is important to understand that this surgery is not generally necessary for normal function in life's daily activities***.

***Pre-Operative Rehabilitation***

ACL reconstruction surgery should be done after the initial injury has had time to settle down. This decreases the risk of *stiffness after surgery*. In particular, your knee should **not be swollen**, you should have **full range of motion**, and you should be able to **walk normally**. There are some exceptions to this; sometimes an associated injury like a large meniscal tear which blocks full knee motion, multiple ligament injuries around the knee, or a large articular cartilage injury will cause us to recommend surgery sooner.

If your range of motion is limited, we will give you stretching and gentle strengthening exercises to do before surgery.

Frequent **icing** will help decrease pain and swelling, as will anti-inflammatory medications like Advil, Motrin, ibuprofen, Aleve, or naprosyn. ***Try to stop taking all anti-inflammatory medications 3-4 days prior to surgery.***

***Surgery***

The ACL does not heal on its own. Because of this, we must reconstruct it (replace it with another tissue), rather than simply repair it. In order to do this we need to take **graft tissue** from another source, either your own tissue or donated (cadaver) tissue. In all cases, the graft undergoes a period of healing and remodeling to function like a ligament. Because of this healing time, protecting your graft for some time after surgery is important and will direct your rehabilitation.

ACL reconstruction is outpatient surgery with an **arthroscope** (a camera used to look into the joint) and three or four small incisions around the knee to look and work inside. Depending on which type of graft is used, there will also be one or two slightly longer incisions on the front of the knee. Regardless of the type of graft, the surgery involves drilling a tunnel in the tibia and drilling a second tunnel in the femur. There will also be some type of fixation (usually a screw) that keeps your graft secure in the tunnels while the graft heals to the bones. While you are asleep, we will examine the other ligaments around the knee, look at your meniscus and articular cartilage, and treat any associated injuries.

*Graft Choice*

As mentioned above, there are different graft options available for ACL reconstruction. There are pros and cons to each; which type we recommend will depend on your age, activity level, and associated injuries.

**Autografts** are tissues from your own body. There are two main autograft options:

- **Patellar tendon** grafts use the middle 1/3 of the patellar tendon with bone pieces on each end— one from the patella and one from the tibia. The bone ends are fixed in the tunnels with large screws, ultimately with bone to bone healing, which is strong and reliable. Patellar tendon grafts are often used for young active individuals (16-23 years old) that play sports like football, soccer, and lacrosse. The downside to using this graft is that it can be more painful right after surgery than other graft choices. There is also an increased risk of having pain or cartilage wear behind the kneecap. It is estimated that 20% of patients experience this, although it has lessened with newer rehabilitation techniques. In addition, the rehabilitation with a patellar tendon graft is more intense and takes more effort than for other graft types.