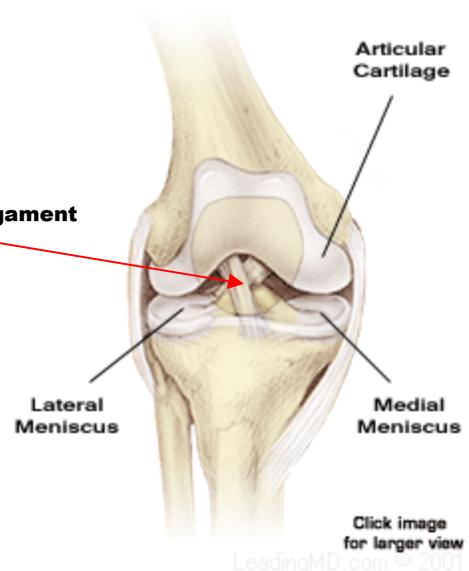


# ANTERIOR CRUCIATE LIGAMENT (ACL) TEAR

## ◆ What is it?

The anterior cruciate ligament is one of two ligaments inside the knee joint (the other is the posterior cruciate ligament). This ligament runs from the top surface of the tibia diagonally into the large notch at the end of the femur. The ACL prevents the tibia from sliding too far forward underneath the femur. It also helps prevent hyperextending and over-rotation of the femur on the tibia.

Anterior Cruciate Ligament



An ACL injury usually occurs when the knee is sharply twisted or extended beyond its normal range of motion. The three grades of ACL injury range from mild to severe.

**Grade I** - Trauma to the ligament is relatively minor. Some of the fibers are stretched. This is considered a "**sprain**".

**Grade II** - Trauma to the ligament is more severe. Some of the fibers are torn. This is called a "**partial tear**".

**Grade III** - This is the most severe ACL injury. The fibers of the ligament are completely torn. It is referred to as a "**complete tear**".

## ◆ Signs and Symptoms of this Condition

- Pop or tear heard at the time of the injury (usually while cutting, jumping, or twisting)
- Inability to continue participating in the sport or activity in which injury occurred
- Large knee swelling (water on the knee) within hours after the injury
- Unable to walk with the knee straight...tend to limp with knee kept bent slightly
- Instability or giving way of the knee when pivoting or changing directions (in chronic cases once the swelling and pain have diminished from the initial injury and athlete has returned to activity)

## ◆ Causes

Sports and activities involving a lot of planting of the foot and cutting/quickly changing directions of running are commonly associated with ACL injuries. Soccer, basketball, skiing, and football are examples of sports in which a high number of ACL injuries occur. These sports require movements that cause the femur to pivot on the tibia.

The ACL is also very susceptible to injury in contact sports. It can be injured simultaneously with the medial collateral ligament (MCL) when the knee is struck from the outside causing the knee to bend inward. Another contact mechanism that can result in an ACL tear is a hit that

results in the tibia being driven forward or the femur being driven backward resulting in knee hyperextension.

Female athletes may be at more risk of ACL injuries. Competitive female soccer and basketball players have 3-5 times higher risk of ACL injury than their male counterparts. Why do females seem more likely to injure the ACL when they play the same sports as males? Many current studies are looking into the physical differences between the sexes for answers.

Some of these differences may involve the following:

- Smaller ACL and notch within which the ACL is located
- Less muscular strength or timing of muscular activation to provide dynamic protection of the ACL
- Body mechanics (larger angle of hip to knee in females vs males)
- Hormonal differences (estrogen and its possible effects on ligament laxity contributing to joint looseness)

### ◆ **What Can I do to Prevent an ACL Tear?**

- Warm-up before vigorous sporting activities
- Land with knees slightly bent when jumping (in basketball and volleyball) to avoid knee hyperextension.
- Maintain good hamstring and quadriceps strength
- Use proper shoes for the surface (appropriate length of cleat for a given surface)
- Perform sport-specific neuromuscular training (balancing on one leg with eyes closed or while tossing ball at wall, single leg hopping in different directions [like hop-scotch])

### ◆ **Prognosis**

Some knee ligaments, such as the medial collateral ligament (MCL), heal reliably without surgery. Some partially torn ACLs, particularly in children and adolescents, may also heal without surgery. However, a complete tear of the ACL will not heal on its own. The torn ACL may scar back to the intact PCL within the knee, but this rarely returns stability to the knee. Surgery for a complete ACL tear (an ACL reconstruction) involves replacing the ACL with other tissue (a graft).

#### ***Is surgery always needed for an ACL tear?***

Surgery is not required for all ACL injuries. Partial tears, in which a physical examination shows a relatively stable knee, may be treated with bracing and rehabilitation. Even some patients with complete ACL tears do not need reconstruction. These "copers" are typically older patients with lower physical activity, who do not participate in pivoting and cutting activities.

#### ***Why should the ACL be reconstructed?***

One reason to reconstruct the ACL is to provide knee stability that allows for return to activities and sports. Another reason is to provide knee stability in order to prevent more injury, such as a meniscal tear, which may eventually lead to degenerative joint disease.

## ◆ Treatment

- Initial Treatment
  - **RICE** – Rest (crutches and staying off the extremity), Ice, Compression (with elastic bandage, and Elevation
- See your health care provider for an examination
- Anti-inflammatory medication (aspirin, ibuprofen, etc) may be helpful in reducing both pain and inflammation
- Rehabilitation involves eliminating the swelling, regaining full knee range of motion, regaining muscle strength (especially the hamstrings), regaining neuromuscular control of the knee through proprioceptive training exercises (exercises involving balancing on the injured extremity while providing different challenges to balance)
- If surgical intervention is planned, it is important to reduce the swelling, increase the range of motion, and regain as much strength as possible prior to surgery to help ensure a better recovery and minimize risk of complications after surgery.
- Postoperative protocols involve phased progression as appropriate to regain full range of motion, muscle strength, and proprioception/neuromuscular control of your knee. Your physical therapist will explain the protocol in detail and progress you through it if you and your orthopedic surgeon choose to have the ACL surgically reconstructed.