



BAY AREA ORTHOPEDIC

SURGERY & SPORTS MEDICINE

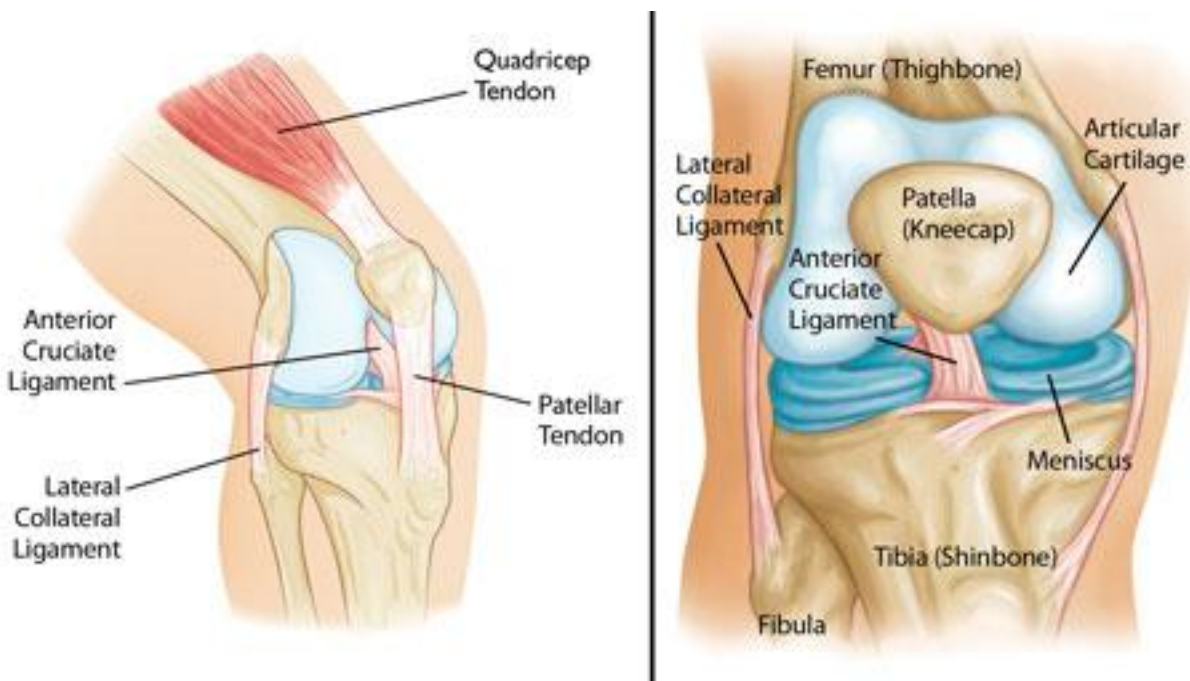
Common Knee Injuries

In 2010, there were roughly 10.4 million patient visits to doctors' offices because of common knee injuries such as fractures, dislocations, sprains, and ligament tears. Knee injury is one of the most common reasons people see their doctors.

Your knee is a complex joint with many components, making it vulnerable to a variety of injuries. Many knee injuries can be successfully treated with simple measures, such as bracing and rehabilitation exercises. Other injuries may require surgery to correct.

Anatomy

The knee is the largest joint in the body, and one of the most easily injured. It is made up of four main things: bones, cartilage, ligaments, and tendons.



Different views of the normal anatomy of the knee.

- **Bones.** Three bones meet to form your knee joint: your thighbone (femur), shinbone (tibia), and kneecap (patella).
- **Articular cartilage.** The ends of the femur and tibia, and the back of the patella are covered with articular cartilage. This slippery substance helps your knee bones glide smoothly across each other as you bend or straighten your leg.

- **Meniscus.** Two wedge-shaped pieces of meniscal cartilage act as "shock absorbers" between your femur and tibia. Different from articular cartilage, the meniscus is tough and rubbery to help cushion and stabilize the joint. When people talk about torn cartilage in the knee, they are usually referring to torn meniscus.
- **Ligaments.** Bones are connected to other bones by ligaments. The four main ligaments in your knee act like strong ropes to hold the bones together and keep your knee stable.
 - Collateral Ligaments.** These are found on the sides of your knee. The medial collateral ligament is on the inside of your knee, and the lateral collateral ligament is on the outside. They control the sideways motion of your knee and brace it against unusual movement.
 - Cruciate ligaments.** These are found inside your knee joint. They cross each other to form an "X" with the anterior cruciate ligament in front and the posterior cruciate ligament in back. The cruciate ligaments control the back and forth motion of your knee.
- **Tendons.** Muscles are connected to bones by tendons. The quadriceps tendon connects the muscles in the front of your thigh to your patella. Stretching from your patella to your shinbone is the patellar tendon.

Common Knee Injuries

Your knee is made up of many important structures, any of which can be injured. The most common knee injuries include fractures around the knee, dislocation, and sprains and tears of soft tissues, like ligaments. In many cases, injuries involve more than one structure in the knee.

Pain and swelling are the most common signs of knee injury. In addition, your knee may catch or lock up. Many knee injuries cause instability — the feeling that your knee is giving way.

Fractures

The most common bone broken around the knee is the patella. The ends of the femur and tibia where they meet to form the knee joint can also be fractured. Many fractures around the knee are caused by high energy trauma, such as falls from significant heights and motor vehicle collisions.



Patellar fracture.

Dislocation

A dislocation occurs when the bones of the knee are out of place, either completely or partially. For example, the femur and tibia can be forced out of alignment, and the patella can also slip out of place. Dislocations can be caused by an abnormality in the structure of a person's knee. In people who have normal knee structure, dislocations are most often caused by high energy trauma, such as falls, motor vehicle crashes, and sports-related contact.

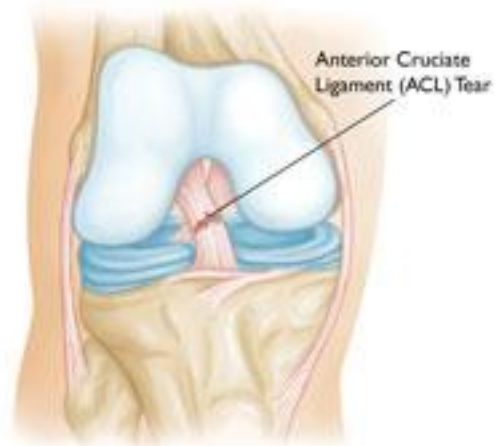


Patellar dislocation.

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Anterior Cruciate Ligament (ACL) Injuries

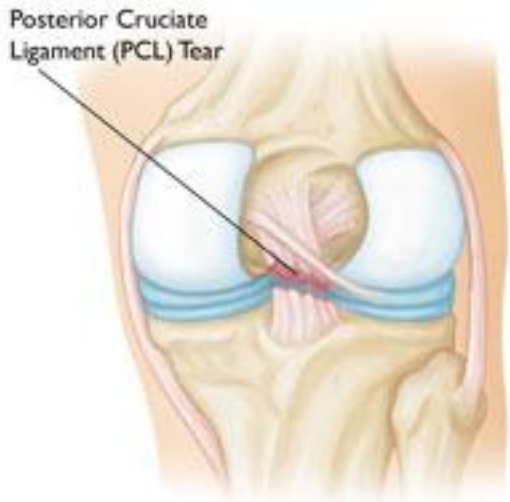
The anterior cruciate ligament is often injured during sports activities. Athletes who participate in high demand sports like soccer, football, and basketball are more likely to injure their anterior cruciate ligaments. Changing direction rapidly or landing from a jump incorrectly can tear the ACL. About half of all injuries to the anterior cruciate ligament occur along with damage to other structures in the knee, such as articular cartilage, meniscus, or other ligaments.



Anterior cruciate ligament tear.

Posterior Cruciate Ligament Injuries

The posterior cruciate ligament is often injured from a blow to the front of the knee while the knee is bent. This often occurs in motor vehicle crashes and sports-related contact. Posterior cruciate ligament tears tend to be partial tears with the potential to heal on their own.



Posterior cruciate ligament tear (shown from back of knee).

Collateral Ligament Injuries

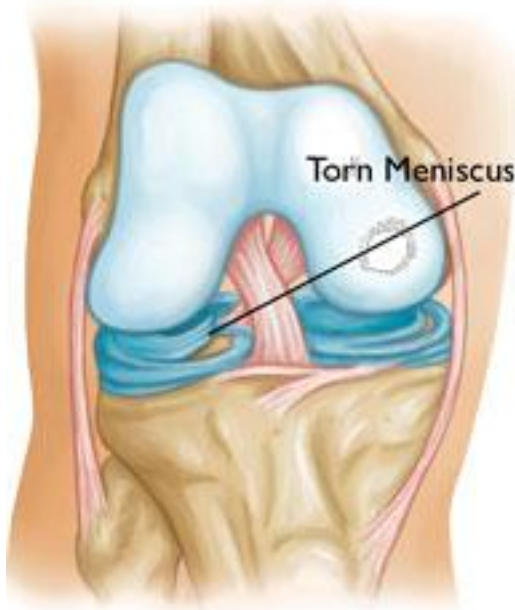
Injuries to the collateral ligaments are usually caused by a force that pushes the knee sideways. These are often contact injuries. Injuries to the MCL are usually caused by a direct blow to the outside of the knee, and are often sports-related. Blows to the inside of the knee that push the knee outwards may injure the lateral collateral ligament. Lateral collateral ligament tears occur less frequently than other knee injuries.



Tears of the medial and lateral collateral ligaments.

Meniscal Tears

Sudden meniscal tears often happen during sports. Tears in the meniscus can occur when twisting, cutting, pivoting, or being tackled. Meniscal tears may also occur as a result of arthritis or aging. Just an awkward twist when getting up from a chair may be enough to cause a tear, if the menisci have weakened with age.



Meniscal tear.

Tendon Tears

The quadriceps and patellar tendons can be stretched and torn. Although anyone can injure these tendons, tears are more common among middle-aged people who play running or jumping sports. Falls, direct force to the front of the knee, and landing awkwardly from a jump are common causes of knee tendon injuries.



Treatment of Knee Injuries

When you are first injured, the RICE method -- rest, ice, gentle compression and elevation - can help speed your recovery.



Be sure to seek treatment as soon as possible, especially if you:

- Hear a popping noise and feel your knee give out at the time of injury
- Have severe pain
- Cannot move the knee
- Begin limping
- Have swelling at the injury site

The type of treatment your doctor recommends will depend on several factors, such as the severity of your injury, your age, general health, and activity level.

Nonsurgical Treatment

Many knee injuries can be treated with simple measures, such as:

- **Immobilization.** Your doctor may recommend a brace to prevent your knee from moving. If you have fractured a bone, a cast or brace may hold the bones in place while they heal. To further protect your knee, you may be given crutches to keep you from putting weight on your leg.
- **Physical therapy.** Specific exercises will restore function to your knee and strengthen the leg muscles that support it.
- **Non-steroidal anti-inflammatory medicines.** Drugs like aspirin and ibuprofen reduce pain and swelling.

Surgical Treatment

Many fractures and injuries around the knee require surgery to fully restore function to your leg. In some cases - such as many ACL tears — surgery can be done arthroscopically using miniature instruments and small incisions. Many injuries require open surgery with a larger incision that provides your surgeon with a more direct view and easier access to the injured structures.



(Left) Knee arthroscopy. **(Right)** Close-up of an arthroscopic meniscal surgery.

SOURCE: Department of Research & Scientific Affairs, American Academy of Orthopaedic Surgeons.

Rosemont, IL: AAOS; February 2014. Based on data from the National Ambulatory Medical Care Survey, 2010; Centers for Disease Control and Prevention.