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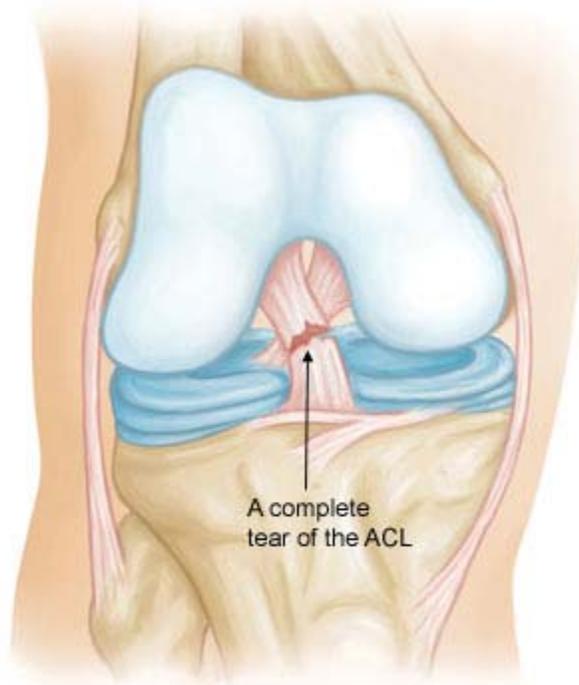
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## **ACL Tear**

The ACL, or anterior cruciate ligament, is the main stabilizer on the insider of the knee. Tears are common knee injuries in younger people, particularly athletes, who injure the knee during sports. Injuries usually occur with twisting while the leg is moving forward. Degenerative tears can occur in older individuals, often without injury, and frequently do not require treatment. ACL tears can occur in association with other knee injuries including meniscal tears, collateral ligament injuries, PCL tears, and osteochondral injuries (injury to the joint cartilage).

### **Symptoms:**

There is usually a knee injury, and a painful pop that can be felt and/or heard, ACL tears often bleed within the knee, causing a large hemarthrosis (blood-filled knee) within minutes or hours of the injury. There is usually pain and difficulty walking at the time of the injury, but this often subsides within several days. Athletes are not usually able to return to play. The knee becomes stiff with a day or two. Once the initial pain and swelling subside, the knee may feel relatively normal, or there may be instability—a feeling that the knee will buckle or give way—with normal daily activities, or sometimes just with sports.



## Cause:

The anterior cruciate ligament can be injured in several ways:

- Changing direction rapidly
- Stopping suddenly
- Slowing down while running
- Landing from a jump incorrectly
- Direct contact or collision, such as a football tackle

ACL injuries are usually complete, meaning the ligament is completely torn, or partial tears. Partial tears can occur in young people, and in older patients. Partial tears usually involve complete tear of a portion of the ligament, and stretching of the remainder of the ligament that renders the ligament non-functional. Partial tears are often treated like complete tears, as a result. Several studies have shown that female athletes have a higher incidence of ACL injury than male athletes in certain sports. It has been proposed that this is due to differences in physical conditioning, muscular strength, and neuromuscular control. Other suggested causes include differences in pelvis and lower extremity



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(leg) alignment, increased looseness in ligaments, and the effects of estrogen on ligament properties.

## Diagnosis:

A careful history and physical examination will often make the diagnosis. When the knee is painful and swollen, it may be difficult to detect a torn ACL, but over time, as pain and swelling subside, knee instability can often be detected. Plain x-rays are often obtained and can show associated conditions, such as arthritis, or small fractures that sometimes accompany ACL tears. Because of its location in the center of the knee, ultrasound is not often able to visualize the ACL. MRI is often needed to confirm the diagnosis, and to examine for associated injuries such as meniscus tear, osteochondral (joint cartilage) injuries, and bone bruises, which are commonly seen with ACL tears.

## Treatment:

ACL tears are typically surgical problems in young people, and in older active people. There is no set age limit, but all tears in patients under age 18 should be reconstructed, and most tears in people over the age of 60 do not need to be repaired. Conservative treatment is recommended early, or when the diagnosis is uncertain. This may include:

- For an acute injury, a brief period of RICE (rest, ice, compression, elevation) and bracing.
- Activity modification. Avoid the activities that worsen symptoms.
- Non-steroidal anti-inflammatory drugs (NSAIDs). May relieve pain and inflammation.
- Physical therapy. Rehabilitation can be beneficial several days after an acute injury, to help restore mobility to the stiff knee, as well as to maintain normal strength.
- PRP injection. There is no data to show that PRP can be beneficial with ACL tears. There is research underway with stem cell injections, and injections of concentrated bone marrow, with promising early results.



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## **Surgery:**

Surgery, arthroscopic ACL reconstruction is indicated in all young people, under 18 years old, and in other patients with symptomatic instability and desire to return to an active lifestyle. The all-arthroscopic procedure is done in an ambulatory surgery setting through 4 small, 1/4" incisions. ACL reconstruction is usually not done emergently. Surgery is usually delayed until the acute pain and swelling have resolved. The ACL cannot be repaired, in general, and usually needs to be reconstructed. With a reconstruction, another piece of tissue, usually a tendon from a cadaver or elsewhere in the patient's body, is secured into position after the torn ACL is removed. Sometimes tears that result in detachment of the tendon from the femur (thigh bone), without tearing of the substance of the ligament, can be repaired directly to the bone, or stimulated to heal using a technique called microfracture. These types of tears are uncommon. With any surgical repair or reconstructive procedure, postoperative physical therapy is usually started immediately after the procedure. Degenerative tears that occur in older individuals that do not cause symptoms are not usually treated surgically. Some ACL tears in "middle-aged" people, between the age of 20 and 60 can be treated with physical therapy to strengthen secondary stabilizers in the knee, bracing, and activity modification.