

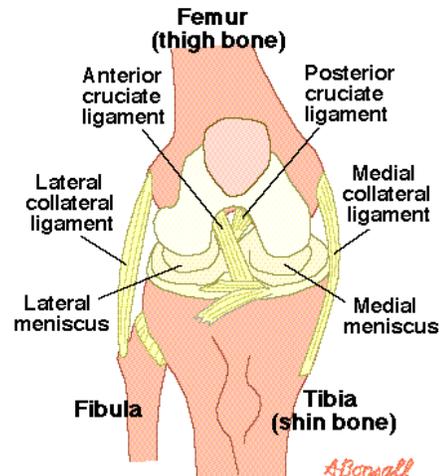
Tear of the Anterior Cruciate Ligament: **THE ACL TEAR**

ACL Anatomy and Function

The ACL is **one of major** ligaments of the knee. It is a strong rope like structure that attaches to the femur (thigh bone) and travels within the knee joint to the upper surface of the tibia (shin bone). It forms a cross pattern alignment with its counterpart, the posterior cruciate ligament (PCL).

The function of the ACL is to provide stability to the knee and minimize stress across the knee joint by:

- Restraining excessive forward movement of the tibia in relation to the femur
- Limiting rotational movements of the knee.



KNEE JOINT front view

Injury

Tears of the ACL are relatively common in sports that require a lot of twisting and changing of direction. When an ACL injury occurs, the knee becomes less stable. The ACL injury is a problem because this instability can make sudden, pivoting movements difficult, and it may make the knee more prone to developing arthritis and cartilage tears. Most incidents stem from sudden twisting of the knee when the foot is firmly planted on the ground or landing from a jump involving deceleration at the foot and knee. If an impact injury takes place at the knee, then it is very likely the medial ligaments and the menisci may also be injured in addition to the ACL. When the ACL ruptures you will often feel something giving way in the knee or hear a popping sound. **Most people cannot continue with their activity and the knee generally swells up within hours due to bleeding into the knee joint from torn blood vessels in the damaged ligament.** Studies have shown that female athletes are two to four times more likely to suffer ACL tears than male athletes participating in the same sports.

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Signs and Symptoms

- Restricted movement in the knee joint, especially when *straightening (extension)*.
- The knee feels very unstable, especially when attempting to change direction.
- Generalized tenderness at the knee and swelling from the initial injury will usually be gone after two to four weeks.

Acute Management and “prehabilitation” prior to surgery

- **RICE** (**R**est, **I**ce, **C**ompression and **E**levation) principle and electrotherapeutic modalities should be used immediately to control the amount of swelling and prevent further damage to the knee
- Restoration of **full extension** (straightening) as soon as possible
- Strengthening of knee and hip muscles
- Restoration of normal walking pattern- temporary use of crutches may be required until full weight-bearing is tolerated

Diagnosis

- Plain X-rays are important to rule out a significant fracture and usually appear normal.
- MRI scanning is shown to be the most reliable and non-invasive way of diagnosing an ACL tear and for examining other structures that may have been injured in conjunction at the knee joint.

Is Surgery always indicated?

Many factors must be considered when determining whether to opt for conservative or surgical management;

- Activity level and expectations
- Associated injuries (MCL tear and/or meniscal tear)
- Amount of abnormal knee laxity, or looseness.
- Age
- Occupation (physical or sedentary)
- Social and financial factors

If surgery is not indicated, rehabilitation of the knee begins with exercises to help restore full range of motion. This is followed by strengthening exercises for the muscles around the knee. A return to sports with or without a brace is allowed only after leg strength, balance and coordination have returned to near normal.

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Surgical Treatment

Current techniques involve reconstructing the ACL by replacing it out of tissue harvested from the tendon below the kneecap or hamstring muscles around the knee joint to reproduce the normal kinetic functions of the ligament. Over time, it's been shown that the new ACL regains its blood supply and fully recovers.

Rehabilitation after surgery

Rehabilitation of the knee after ACL reconstruction requires time and hard work and is aimed to:

- Control Swelling and regain Range of movement
- Regain weight-bearing status ASAP
- Control lower limb alignment with a functional strengthening and neuromuscular training program
- Regain lower limb flexibility
- Maximize balance and knee joint position sense for daily and sporting activities
- Regain proximal/"core" strength for return to sport

Bracing of the knee is sometimes required to enhance joint stability upon return to sport.

Return to work and normal daily activities after surgery usually take approximately 1-2 weeks. For athletes, return to high impact sports can range from 6 to 12 months. The overall success rate for ACL surgery is very good. Many studies have shown that between 65-85% of patients are able to return to sports and workplace activities without symptoms of knee instability.

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