

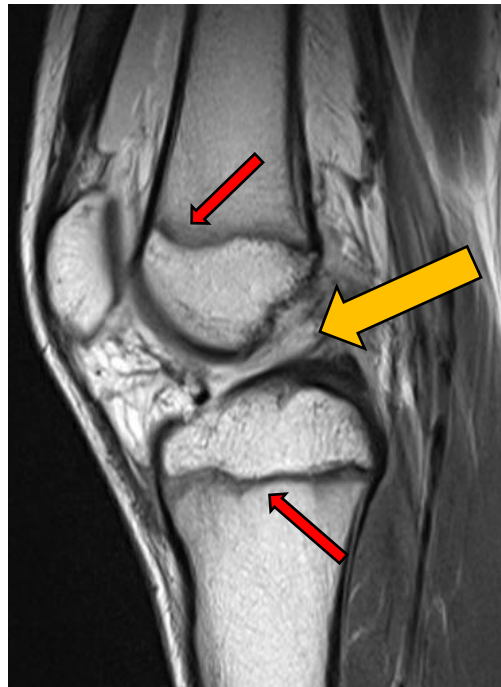
STEVEN CHUDIK MD

SHOULDER, KNEE & SPORTS MEDICINE

Pediatric Anterior Cruciate Ligament (ACL) Tear

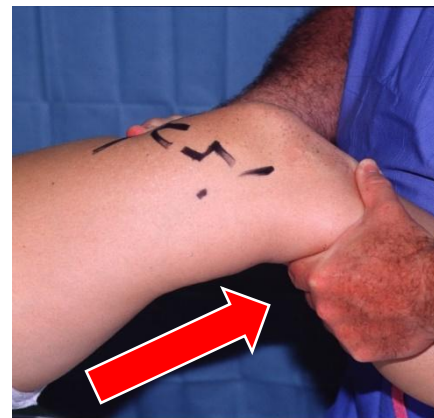
An anterior cruciate ligament (ACL) sprain is a tear of one of the four major ligaments of the knee. The ACL is a ropelike structure in the center of the knee that helps maintain the normal relationship of the femur (thigh bone) and the tibia (leg bone). When torn, the ACL does not heal and the knee can be unstable (shifts or gives way) during sports that require pivoting, changing direction (cutting), jumping, or landing. About half the people who tear their ACL also tear their meniscus in their knee. ACL tears in pediatric patients pose an extra challenge in that typical surgeries to reconstruct the ACL can injure the open growth plates around the knee and affect normal growth.

The diagnosis of an ACL tear is usually made on physical examination, but MRI can be helpful, especially when the patient is too swollen or guarded to allow a thorough examination. The MRI also is needed to diagnose any associated meniscal or cartilage damage.



MRI showing a torn ACL indicated by the gold arrow on a patient with open growth plates visual at red arrows.

Before (left) and after (right) pictures of a Lachman maneuver performed on a knee revealing abnormal anterior (forward) shifting of the tibia (shinbone) on the femur (thigh bone) indicating a tear of the ACL.



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Frequent Signs and Symptoms

- Pop or tear heard or felt at the time of injury
- An inability to continue playing after the injury
- Large amount of swelling in the knee noticed within six to eight hours after the injury
- Inability to straighten knee after an injury
- Knee instability, particularly when trying to pivot, cut (rapidly change direction), or jump
- Swelling with repeated giving way
- Occasional locking when there is concurrent injury to the meniscus.

Etiology (Causes)

- 70 to 80 percent result from non-contact injury (landing awkwardly or cutting)
- Contact injury where the knee sustains a direct hit from another player such as getting tackled at the knee

Risk Factors

- Sports that require pivoting, jumping, cutting, or changing direction (basketball, soccer, volleyball) or contact sports (football, rugby)
- Poor physical conditioning
- Female
- High playing surface to shoe friction coefficient or traction

Prevention

- Appropriately warm up and stretch before practice and competition.
- Maintain appropriate conditioning:
 - Thigh, leg, and knee flexibility
 - Muscle strength and endurance
 - Cardiovascular fitness
- Train to use proper technique when cutting and landing.
 - There are specific ACL prevention programs that can lower the risk for injury.
- Use proper equipment (appropriate length of cleats for surface).



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Outcomes

The ACL will not heal on its own, but most people can perform normal daily activities after an appropriate rehabilitation program. For young patients and those who want to return to sports, surgery is recommended. If left untreated, the patient is at risk for further injury to their meniscus and cartilage due to knee instability. Individuals at risk for meniscus and cartilage injury and early arthritis if the ACL is left unrepaired. Surgery to reconstruct the ACL while avoiding injury to the growth plate, can result in a stable knee, prevent early progressive damage to the meniscus and cartilage and allow return to full activities.

Potential Complications

- Recurrent instability episodes of instability
- Further injury to the meniscus resulting from recurrent instability episodes (shifting or giving way) which can change the loading on the articular cartilage of the knee and cause premature arthritis
- Injury to other structures of the knee, including the articular cartilage, resulting in arthritis of the knee
- Injury to other ligaments of the knee
- Knee stiffness (loss of knee motion)
- Injury to the growth plate from surgery and growth abnormalities

Treatment Considerations

Initial treatment is focused on returning the knee to its pre-injury status by reducing the pain and swelling and restoring the range of motion, strength, and gait. Walking with crutches until you walk without a limp is often recommended. Range-of-motion, stretching, and strengthening exercises may be carried out at home, although a referral to a physical therapist or athletic trainer is often recommended. If other ligaments are injured along with the ACL, Dr. Chudik may recommend a brace to help hold the knee stable.

For young active patients, surgery to reconstruct the ACL usually is recommended to allow return to activities and sport. Surgery also is appropriate for ACL injuries in young active children who have combined injuries to other ligaments, the meniscus, or the articular cartilage. Dr. Chudik developed special technique, to reconstruct ACL's in young patients to avoid injury to their open growth plates.



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Possible Medications

- Nonsteroidal anti-inflammatory medications, such as aspirin and ibuprofen (do not take within seven days before surgery), or other minor pain relievers, such as acetaminophen, are sometimes recommended. Take these as directed by your physician. Contact your physician immediately if any bleeding, stomach upset, or signs of an allergic reaction occur.
- Pain relievers are usually not prescribed for this condition.

Modalities

- Cold is used to relieve pain and reduce inflammation. Cold should be applied for 15 to 20 minutes every two to three hours for inflammation and pain and immediately after any activity that aggravates your symptoms. Use ice packs or an ice massage with a cloth between the ice and your skin to prevent burning /freezing your skin.

Notify My Office if Symptoms Worsen

