Anterior Cruciate Ligament (ACL) Sprain

What is an anterior cruciate ligament (ACL) sprain?

A sprain is a joint injury that causes a stretch or a tear in a ligament. Ligaments are strong bands of tissue that connect one bone to another. The anterior cruciate ligament (ACL) is one of the major ligaments in the middle of the knee. It connects the thigh bone (femur) to the shin bone (tibia). This ligament, along with the posterior cruciate ligament, helps keep the knee stable and protects the femur from sliding or turning on the tibia.

Sprains are graded I, II, or III depending on their severity:

- grade I sprain: pain with minimal damage to the ligaments
- grade II sprain: more ligament damage and mild looseness of the joint
- grade III sprain: the ligament is completely torn and the joint is very loose or unstable.

How does it occur?

The anterior cruciate ligament is frequently injured in forced twisting motions of the knee. It may also become injured when the knee is straightened further than it normally can straighten (hyperextended). It sometimes occurs when the thigh bone is forcefully pushed across the shin bone, such as with a sudden stop while you are running or a sudden transfer of weight while you are skiing.

What are the symptoms?

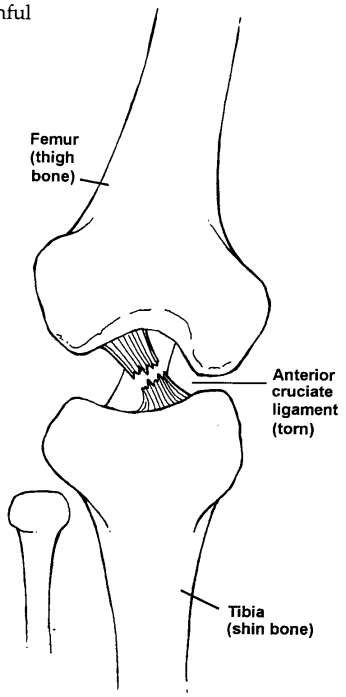
There is usually a loud, painful pop when the joint is first injured. This is often followed by a lot of swelling of the knee within the first several hours after the injury. This swelling is called an effusion and is made up of blood in the knee joint.

If you have torn your anterior cruciate ligament in an injury that occurred months or years ago and you haven't had reconstructive surgery, you may have the feeling that the knee is giving way during twisting or pivoting movements.

How is it diagnosed?

Your doctor will examine your knee and may find that your knee has become loose. If you have swelling in the joint, your doctor may decide to remove the blood in your knee with a needle and syringe. You may need x-rays to see if there is an injury to the bones in your knee. An MRI (magnetic resonance imaging) scan may

Anterior Cruciate Ligament Tear



Front view of knee with patella (kneecap) removed

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also be done and should clearly show the condition of your ACL (as well as that of other ligaments and cartilage).

How is it treated?

Treatment includes the following:

- Put an ice pack on your knee for 20 to 30 minutes every 3 to 4 hours for 2 or 3 days or until the pain goes away.
- Keep your knee elevated whenever possible by placing a pillow underneath it until the swelling goes away.
- Do the exercises recommended by your doctor or physical therapist.

Your doctor may recommend that you:

- Wrap an elastic bandage around your knee to keep the swelling from getting worse.
- Use a knee immobilizer initially to protect the knee.
- Use crutches.

For complete tears, you and your doctor will decide if you should have intense rehabilitation or if you should have surgery followed by rehabilitation. The torn anterior cruciate ligament cannot be sewn back together. The ligament must be reconstructed by taking ligaments or tendons from another part of your leg and connecting them to the tibia and femur.

You may consider having reconstructive ACL surgery if:

- Your knee is unstable and gives out during routine or athletic activity.
- You are a high-level athlete and your knee could be unstable and give out during your sport (for example, basketball, football, or soccer).
- You are a younger person who is not willing to give up an athletic lifestyle.
- You want to prevent further injury to your knee. An unstable knee may lead to injuries of the meniscus and arthritis.

You may consider not having the surgery if:

- Your knee is not unstable and is not painful and you are able to do your chosen activities without symptoms.
- You are willing to give up sports that put extra stress on your knee.
- You are not involved in sports.

If a growing child tears an ACL, the doctor may recommend that surgery be postponed until the child has stopped growing.

When can I return to my sport or activity?

The goal of rehabilitation is to return you to your sport or activity as soon as is safely possible. If you return too soon you may worsen your injury, which could lead to permanent damage. Everyone recovers from injury at a different rate. Return to your activity will be determined by how soon your knee recovers, not by how many days or weeks it has been since your injury occurred. In general, the longer you have symptoms before you start treatment, the longer it will take to get better.

You may safely return to your sport or activity when, starting from the top of the list and progressing to the end, each of the following is true:

- Your injured knee can be fully straightened and bent without pain.
- Your knee and leg have regained normal strength compared to the uninjured knee and leg.
- The effusion is gone.
- You are able to jog straight ahead without limping.
- You are able to sprint straight ahead without limping.
- You are able to do 45-degree cuts.
- You are able to do 90-degree cuts.
- You are able to do 20-yard figure-of-eight runs.
- You are able to do 10-yard figure-of-eight runs.

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- You are able to jump on both legs without pain and jump on the injured leg without pain.

If you feel that your knee is giving way or if you develop pain or have swelling in your knee, you should see your doctor. If you've had surgery, be sure that your doctor has told you that you can return to your sport.

How can I prevent an anterior cruciate ligament sprain?

Unfortunately, most injuries to the anterior cruciate ligament occur during accidents that are not preventable. However, you may be able to avoid these injuries by having strong thigh and hamstring muscles and maintaining a good leg stretching routine. In activities such as skiing, make sure your ski bindings are set correctly by a trained professional so that your skis will release when you fall.

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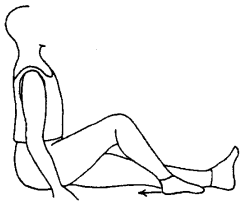
Anterior Cruciate Ligament Sprain (ACL) Rehabilitation Exercises

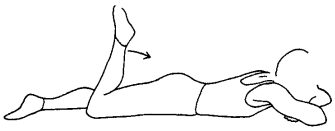
You may begin exercising your knee when the swelling has gone down and you are able to stand with equal weight on both legs.

1. Heel slide: Sit on a firm surface with your legs straight in front of you. Slowly slide the heel of your injured leg toward your buttock by pulling your knee to your chest as you slide. Return to the starting position. Repeat this 20 times.

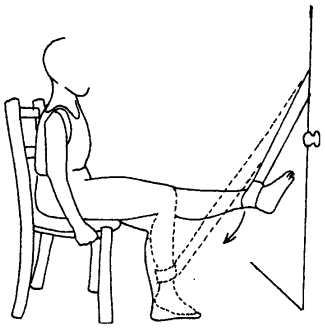


Heel slide

2. Prone knee flexion: Lying on your stomach, bend your injured knee and try to touch your buttock with your heel. Slowly return to the starting position. As this gets easier, you can add an ankle weight of 3 to 5 pounds. Repeat 10 times. Do 3 sets of 10.



Prone knee flexion



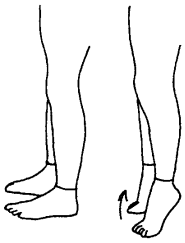
Theraband hamstring curls

3. Thera-Band hamstring curls: Sit in a chair facing a door and about 3 feet from the door. Loop and tie one end of the tubing around the ankle of your injured leg. Tie a knot in the other end of the Thera-Band and shut the knot in the door. Bend your knee so that your foot slides along the floor and moves back underneath the chair, stretching the tubing. Slowly let your foot slide forward again. Repeat this 10 times. Do 3 sets of 10.

You can challenge yourself by moving the chair farther away from the door and increasing the resistance of the Thera-Band.

4. Heel raises: Stand on both feet, raise your heels off the floor and come up onto your toes. Hold this position for 2 seconds and slowly lower yourself back down. Do 3 sets of 10 repetitions.

To challenge yourself, stand only on your injured leg and raise up on your toes, lifting your heel off the floor. Do 3 sets of 10.



Heel raises

After your hamstrings have become stronger and you feel your leg is stable, you can begin strengthening the quadriceps (a large muscle in the front of the thigh). A good way to do this is to do a wall squat with a ball.

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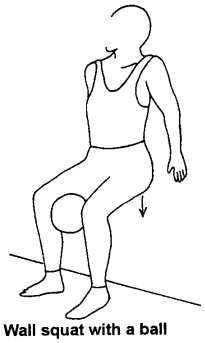

Wall squat with a ball

5. Wall squat with a ball: Stand with your back, shoulders, and head against a wall and look straight ahead. Keep your shoulders relaxed and your feet 1 foot away from the wall and a shoulder-width apart. Place a rolled up pillow or a Nerf ball between your thighs. Keeping your head against the wall, slowly squat while squeezing the pillow or ball at the same time. Squat down until your thighs are parallel to the floor. Hold this position for 10 seconds. Slowly stand back up. Make sure you keep squeezing the pillow or ball throughout this exercise. Repeat 20 times.

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