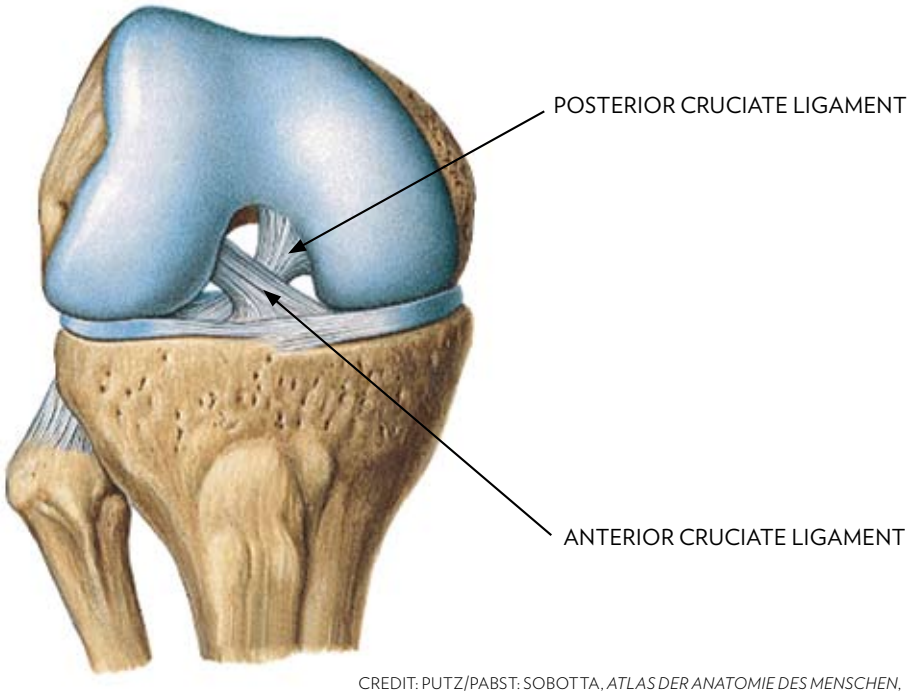
essential skills

BY BEN E. BENJAMIN

CRUCIATE LIGAMENT SPRAINS

Cruciate ligament sprains are often serious, painful, long-term injuries. Typically the client feels an aching pain deep inside the knee—either toward the front, toward the back, or through the knee. It may be difficult to pinpoint the exact location of the pain because it is so deep. Clients will report that squatting down is painful, and if they stay in that position for any length of time, they have difficulty getting up. The knee may or may not become swollen.



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The anterior and posterior cruciate ligaments are two of the major ligaments that hold the knee together. These ligaments crisscross diagonally, forming a front-to-back X deep in the center of the knee joint. By restricting anterior and posterior movement, the cruciate ligaments prevent the bones from rocking around and damaging the inner structures of the knee. In a healthy knee joint, there should be very little visible forward/backward motion—maybe 1/16 of an inch or so.

A person can sprain or rupture one or both cruciate ligaments. When football players go down on the field and don't get up, it often means they have injured or completely ruptured one of these ligaments. The average person is more likely to have a mild to serious sprain that is a continual nuisance.

HOW AND WHY THESE INJURIES OCCUR

Usually a very strange accident or athletic fall causes these injuries. Often the individual feels a sharp pain at the back of the knee or deep within the knee. This is followed by swelling and increased pain over the next few hours, which eventually subsides to a dull ache. In more serious cases, there may be an audible snap followed by searing pain.

Cruciate sprains may also develop gradually over time, with no memorable incident causing the initial tear. Pain may be felt only when the person engages in a strenuous activity, squats down to pick something up, or sits relaxed in a cross-legged position. There may not be any swelling, but the leg usually feels unstable or weak. In these cases, the injury is often due to a strenuous athletic activity that

involves running. Running typically causes little problem with the cruciate ligaments, but it can lead to injuries when the thigh muscles become so fatigued they don't do their part in supporting the leg; this places more weight on the ligaments than they can absorb, resulting in fatigue and slow tearing. More commonly, running may cause a sprain because the ligaments are abnormally loose.

Ligaments are intended to be tight, not loose. Consider a door hinge. If the hinge is screwed in tightly to the door frame, it will last a long time because it moves only in the direction it is intended to move in. If you loosen the screws, before long the door will begin to rock around and break the door, the frame, or a part of the hinge. The same is true with the cruciate ligaments. If they are loose, this puts an increasing strain on surrounding structures, including the collateral ligaments, coronary ligaments, infrapatellar bursa, meniscus, articular cartilage, and patella tendon/ligament mechanism. Bones that are supposed to be held steady on a particular track of movement begin to shift in various directions. This is a prescription for trouble.

Sometimes the cruciate ligaments are loosened by excessive stretching. For instance, depending on a person's body structure, prolonged sitting in lotus or half lotus position may stretch these ligaments and make them more vulnerable to injury. For people practicing yoga or meditation, it is important to have a well-trained instructor as a guide to help avoid such problems.

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Another possibility is that the cruciate ligaments may be congenitally loose. Some individuals know they are loose-jointed; they grew up being able to do things with their bodies that none of their friends could do. In others you can observe hyperextension of the knees, which by definition means that the cruciate ligaments are loose. The clearest way to identify loose cruciates is by doing the anterior pull/posterior push test described in the following section. When the cruciate ligaments are loose, the knee feels wobbly, like a bicycle wheel on which the nuts have been loosened.

INJURY VERIFICATION

Three tests for cruciate ligament injuries are described below. A positive result on Test 1 or Test 2 indicates a fairly acute and serious injury. A positive result on Test 3 is a good indicator of a mild to moderate posterior cruciate ligament sprain, which is more common than an anterior cruciate ligament sprain.

In addition to any assessments you perform, make sure your client sees a physician to rule out serious injury.

TEST 1. ANTERIOR PULL

Place the client's foot on the table with the knee at close to a right angle. Tell the person you are going to sit on the foot. (If you don't mention that, it will seem like an odd thing to do.) Rotate the foot out so it points slightly laterally, and sit on it. Grip the lower leg about three inches below the knee and pull, first gently, then more forcefully if no pain is felt.

Pain on this movement indicates an anterior cruciate ligament sprain.

TEST 2. POSTERIOR PUSH AND COMBINATION TEST (OR PUSH-PULL TEST)
Starting from the same position as in Test 1, place the foot so that it is facing slightly medially. Now push the tibia in a posterior direction, first gently, and then with more force if no pain is felt. Pain on this movement indicates a posterior cruciate ligament sprain. Now perform a combination push-pull movement. With one hand in front of the shin and the other hand wrapped around the calf, push and then pull several times in quick succession to check the amount of anterior-posterior movement in the knee joint.

TEST 3. RESISTED FLEXION OF THE KNEE
Have the client lying supine with the knee flexed and the foot on the table. Lift the foot slightly up off the table and place your hands around the back of the client's heel. Then ask the client to pull the heel forcefully toward the buttock as you resist with equal force, allowing the foot to come off the table four or five inches. Pull for four or five seconds. Pain felt deep inside the front or back of the knee indicates a posterior cruciate sprain. If pain is felt in the hamstring tendons as they pass behind and/or below the knee, this indicates injury to the hamstring tendons, not the cruciate ligaments.

If you're familiar with orthopedic testing, you may be wondering why a resisted test is included in this assessment protocol; we usually use passive tests to assess ligaments and resisted tests to assess muscles and tendons. In fact, resisted flexion is typically used to test for hamstring injuries. However, it is also a useful auxiliary test for the posterior cruciate

because it causes the hamstring attachments at the lower leg to pull the lower leg posteriorly. This mimics the posterior push test described earlier with much more force than you create by pushing while sitting on the table.

When Test 3 is positive, it is usually in combination with several other indicators, pointing toward a posterior cruciate sprain. First, you will probably have noticed that the cruciate ligaments are loose; when you push and then pull several times in succession, the tibia moves quite easily. It may move as much as three quarters of an inch. Remember that in a healthy knee there is barely any noticeable forward/backward movement.

Another indicator is that the pain is felt deep inside the knee and it is difficult to pinpoint its exact location. It may seem as though the pain moves around, though when these clients are asked where they feel pain, they generally point to the back of their knee. There is sometimes visible swelling but not unless the ligament is freshly sprained, causing fairly intense pain. The person reports feeling weak, wobbly, and vulnerable, and likely feels pain when sustaining a deep knee bend for several minutes.

Cruciates can be tricky to assess, so get some help from a therapist who is skilled at injury assessment if you get stuck. It's easy to get confused when a client has multiple injuries in the same knee. This is often the case when the cruciate ligaments are loose and the knee is unstable. I often see someone with patella tendon strain and medial collateral and coronary ligament injuries, as well as a posterior cruciate ligament sprain.

TREATMENT CHOICES

If a client has swelling or severe pain or can't bend or straighten the knee fully, be sure the person goes to a doctor immediately. Without treatment, even a moderately severe sprain can cause a deep ache off and on for six to 12 months. Moreover, if the person continues engaging in high-impact exercise or sports activity with cutting movements, the injury may continue for many years. Without mindful care of the knee, the pain can drag on indefinitely.

SELF-TREATMENT

Beyond rest, there is little self-treatment that can be done because these ligaments are so deep inside the knee. During the first five to seven days after the injury, ice treatment applied for six to eight hours a day with knee extension exercises can reduce the initial pain. With a serious injury, weight-bearing exercise should be limited at first. Athletic activities need to be resumed very slowly, and deep knee bends should be avoided even when picking up a piece of paper from the floor. In short, this injury takes a lot of patience.

MEDICAL TREATMENT

MASSAGE. Massage is useful only as an adjunctive therapy to increase circulation and comfort. The cruciate ligaments are two to three inches inside the knee, so you cannot reach them with your hands to directly affect the tear or scar tissue formation. It is important to know about this injury so that you don't waste a client's time and money on a treatment that will not be effective.

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A clear understanding of the cruciate ligaments leaves you better prepared to help clients who come to you with knee problems.

EXERCISE. Exercise is an important part of the recovery and rehabilitation process, especially if the cruciates are loose and do not adequately stabilize the knee joint. Improved knee-to-foot alignment and increased strength in all of the thigh muscles will make the knee less vulnerable to reinjury through sudden twists and falls. Increased strength in the lower leg will help as well.

Private or group Feldenkrais work can also be very helpful in increasing the stability of the knee joint. In fact, the work originated from Moshe Feldenkrais's attempts to address his own knee problems stemming from a ruptured cruciate ligament.

INJECTION. If there is not a complete rupture, the appropriate use of corticosteroid and proliferant injections can successfully speed recovery, so long as the correct spot or spots are injected. The former will de-inflame a ligament, and the latter will strengthen and tighten a lax ligament. Often, a diagnostic injection of anesthetic is performed first to pinpoint the exact location of the injury.

A series of proliferant injections is particularly helpful if the injury is due to stretched ligaments. This therapy slowly strengthens and tightens the ligaments. Four injections given over several weeks or months can tighten a ligament from one eighth of an inch to three eighths of an inch.

Since the cruciate ligaments lie so deep within the knee, it is difficult to administer an injection precisely, and many physicians will not attempt it. In some cases the ligament remains permanently stretched in spite of the injections, leaving the knee with a chronic feeling of instability and weakness even though the pain is gone. Some of this wobbliness can be overcome if the person builds up and maintains extremely strong muscles in that limb.

SURGERY. In instances where the ligament is ruptured (torn completely in half), surgery is the only treatment.

BE BETTER PREPARED

Cruciate ligament sprains are often troublesome and frustrating injuries, causing elusive knee pains that come and go, deep within the knee. Laxity of the cruciates, whether congenital or caused by overstretching, leads to excessive anterior/posterior movement of the knee. This poses a great risk of injury not only to the cruciates themselves but to many other structures as well. A clear understanding of the cruciate ligaments leaves you better prepared to help clients who come to you with knee problems. With this type of injury, sometimes the most useful service you can provide is a referral for alternative forms of treatment. m&b

For more information on knee injuries, see the Power of Precision Knee Series *DVDs, available at www.benbenjamin.com/store.*

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