

POSTERIOR CRUCIATE LIGAMENT TEAR



■ ■ ■ Description

Posterior cruciate ligament tear is a sprain (tear) of one of the four major ligaments of the knee. The posterior cruciate ligament (PCL) is a ropelike structure that helps keep the normal relationship of the femur (thigh bone) and the tibia (leg bone), so that the leg bone does not slip back over the femur. This ligament is the largest and strongest within the knee. When torn, this ligament may heal in a lengthened (stretched out) position or it may attach to other structures of the knee via scar tissue.

■ ■ ■ Common Signs and Symptoms

- A pop heard or felt at the time of injury, an inability to continue activity after the injury, and significant knee swelling noticed within 6 to 8 hours after the injury
- Inability to straighten knee
- Walking with a limp and knee giving way or buckling, particularly the first several months after injury
- Occasionally, locking when there is concurrent injury to the meniscus cartilage
- Diffuse knee pain, usually in the front half of the knee, behind the kneecap, or in the very back of the knee; pain above or below the kneecap
- Pain that is worse with sitting for long periods, when rising from a sitting position, when going up or down stairs or hills, when kneeling or squatting, and when wearing shoes with heels; often, pain with jumping
- Usually, achy pain, but may be sharp
- Difficulty running backward or backpedaling

■ ■ ■ Causes

PCL tears are caused by a force that exceeds the strength of the ligament. This injury may be a result of a noncontact injury (excessively straightening the knee) or may result from contact, such as getting tackled at the knee (especially forced bending of the knee) or landing on the knee.

■ ■ ■ Risk Increases With

- Contact sports that may result in forced knee bending or excessive straightening of the knee (football, volleyball, basketball, soccer, rugby)
- Poor physical conditioning (strength and flexibility)

■ ■ ■ Preventive Measures

Prevention of this condition is not well understood, but the following measures can be helpful:

- Maintain appropriate conditioning:
 - Thigh, knee, and leg flexibility
 - Muscle strength and endurance
 - Cardiovascular fitness
- Use proper technique.

■ ■ ■ Expected Outcome

The expected outcome is not completely known at this time. Usually it takes 3 to 8 months of conservative treatment and an appropriate rehabilitation program before functional adaptation occurs and resumption of sports is possible. However, arthritis may develop 20 years after injury. It is not known if surgery alters this outcome.

■ ■ ■ Possible Complications

- Frequent recurrence of symptoms, such as diffuse achy knee pain that is worse with sitting, when rising from sitting, when going up or down stairs or hills, when kneeling or squatting, and when wearing shoes with heels, and with jumping
- Giving way, instability, and swelling
- Injury to meniscal cartilage, resulting in locking and swelling of the knee
- Arthritis of the knee
- Injury to other ligaments of the knee
- Knee stiffness (loss of knee motion)

■ ■ ■ General Treatment Considerations

Initial treatment consists of medications and ice to relieve pain and reduce the swelling of the knee. Walking with crutches until you walk without a limp is often recommended (you may put full weight on the injured leg). Range-of-motion, stretching, and strengthening exercises may be carried out at home, although usually referral to a physical therapist or athletic trainer is recommended. Occasionally your physician may recommend a knee brace, especially if other ligaments are injured along with the PCL.

The PCL has a complex structure and as yet cannot be replicated with surgery. Thus for most isolated PCL injuries, surgery is not recommended. Rehabilitation is the treatment of choice. Rehabilitation of PCL tears usually concentrates on reducing knee swelling, regaining knee range of motion, regaining quadriceps muscle control and strength, functional training, bracing (rarely), and education. For severe PCL injuries, particularly those associated with other injuries to the knee, surgical reconstruction (replacement with a graft) may be recommended. Surgery may also be recommended for patients with chronic PCL tears who continue to have symptoms 6 to 12 months after injury. Surgical reconstruction rarely restores complete knee ligament tightness. If the ligament pulls a piece of bone off with it, it is not where it belongs, and the bone is large enough, surgery to replace the bone where it belongs and attach it with a screw, staples, stitches, or pins is often performed.

■ ■ ■ Medication

- Nonsteroidal anti-inflammatory medications, such as aspirin and ibuprofen (do not take within 7 days before

surgery), or other minor pain relievers, such as acetaminophen, are often recommended. Take these as directed by your physician. Contact your physician immediately if any bleeding, stomach upset, or signs of an allergic reaction occur.

- Stronger pain relievers may be prescribed as necessary by your physician. Use only as directed and only as much as you need.

■ ■ ■ Heat and Cold

- Cold is used to relieve pain and reduce inflammation for acute and chronic cases. Cold should be applied for 10 to 15 minutes every 2 to 3 hours for inflammation and pain and immediately after any activity that aggravates your symptoms. Use ice packs or an ice massage.
- Heat may be used before performing stretching and strengthening activities prescribed by your physician, physical therapist, or athletic trainer. Use a heat pack or a warm soak.

■ ■ ■ Notify Our Office If

- Symptoms get worse or do not improve in 6 weeks despite treatment
- New, unexplained symptoms develop (drugs used in treatment may produce side effects)

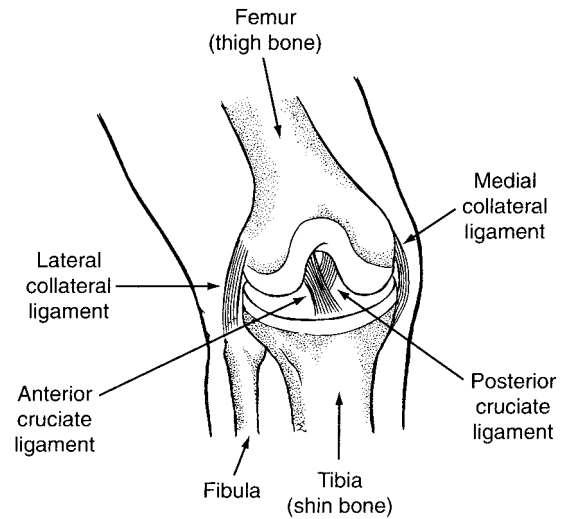


Figure 1

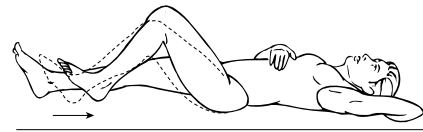
From Economou SG, Economou TS: Instructions for Surgery Patients. Philadelphia, WB Saunders, 1998, p. 377.

EXERCISES

➤ RANGE OF MOTION AND STRETCHING EXERCISES • Posterior Cruciate Ligament Tear—Phase I

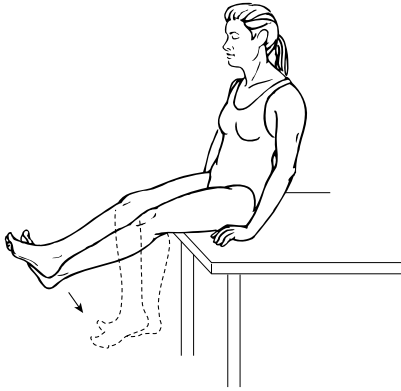
These are some of the *initial* exercises you may start your rehabilitation program with until you see your physician, physical therapist, or athletic trainer again. You may be progressed to Phase II exercises as your condition improves. Please remember:

- Flexible tissue is more tolerant of the stresses placed on it during activities.
- Each stretch should be held for 20 to 30 seconds.
- A *gentle* stretching sensation should be felt.



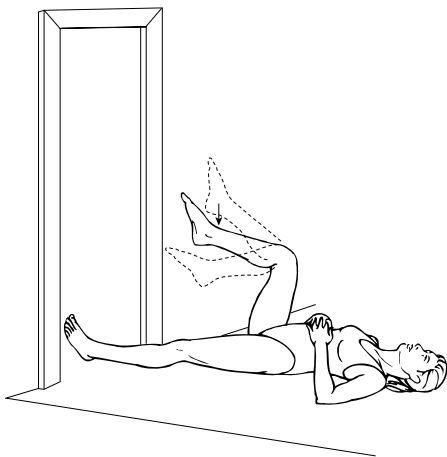
RANGE OF MOTION • Knee Flexion

1. Lie on your back with your legs out straight.
2. Slowly slide your heel toward your buttocks. Bend your knee as far as is comfortable to get a stretching sensation.
3. Hold for _____ seconds.
4. Return your leg to the starting position.
5. Repeat exercise _____ times, _____ times per day.



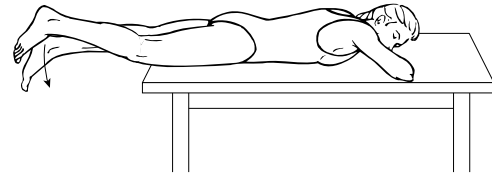
RANGE OF MOTION • Knee Flexion and Extension

1. Sit on the edge of a table or chair.
2. Use the uninjured/unaffected leg to straighten (extend) and bend (flex) the injured/affected leg.
3. **Flexion**—Cross your ankles, placing the uninjured or unaffected leg on top of the injured/affected leg. Pull your heel(s) backward under the surface you are sitting on to increase the amount you can bend your knee.
4. **Extension**—Cross your ankles, placing the uninjured or unaffected leg under the injured/affected leg. Pull your heel(s) backward under the surface you are sitting on to increase the how much you can straighten your knee.
5. Repeat exercise _____ times, _____ times per day.



RANGE OF MOTION • Gravity Knee Flexion

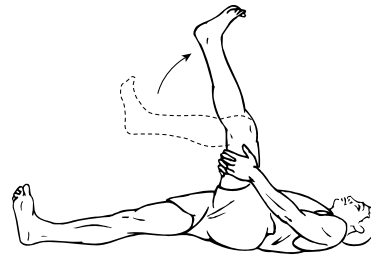
1. Lie on the floor as shown with your toes/foot lightly touching the wall.
2. Allow your toes/foot to slide down the wall, allowing gravity to bend your knee for you.
3. Obtain a “comfortable” stretching sensation.
4. Hold this position for _____ seconds. Then return the leg to the starting position.
5. Repeat exercise _____ times, _____ times per day.



RANGE OF MOTION • Knee Extension, Prone

1. Lie on your stomach on a bed or sturdy table with your knee and leg off the table. The kneecap should be off the edge of the bed or table.
2. Allow gravity to straighten your knee for you.
3. Hold this position for _____ seconds.
4. Repeat exercise _____ times, _____ times per day.

Note: If authorized by your physician, physical therapist, or athletic trainer, you may place a _____ pound weight on your ankle to obtain a more effective stretch.



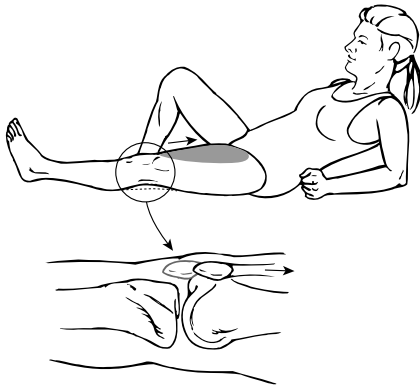
FLEXIBILITY • Hamstrings

1. Lie on your back with your leg bent and both hands holding on to it behind the thigh as shown.
2. Your hip should be bent to **90 degrees** and the thigh pointing straight at the ceiling.
3. Straighten out your knee as far as you can. Keep your thigh pointing straight toward the ceiling.
4. Keep the other leg flat on the floor.
5. Hold this position for _____ seconds.
6. Repeat exercise _____ times, _____ times per day.

➤ **STRENGTHENING EXERCISES** • Posterior Cruciate Ligament Tear—Phase I

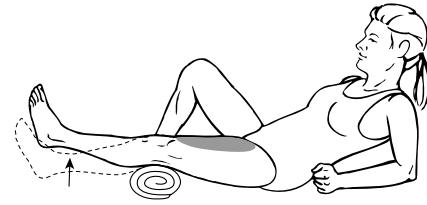
These are some of the *initial* exercises you may start your rehabilitation program with until you see your physician, physical therapist, or athletic trainer again. You may be progressed to Phase II exercises as your condition improves. Please remember:

- Strong muscles with good endurance tolerate stress better.
- Do the exercises as *initially* prescribed by your physician, physical therapist, or athletic trainer. Progress slowly with each exercise, gradually increasing the number of repetitions and weight used under their guidance.



STRENGTH • Quadriceps, Isometrics

1. Lie flat or sit with your leg straight.
2. Tighten the muscle in the front of your thigh as much as you can, pushing the back of your knee flat against the floor. This will pull your kneecap up your thigh, toward your hip.
3. Hold the muscle tight for _____ seconds.
4. Repeat this exercise _____ times, _____ times per day.

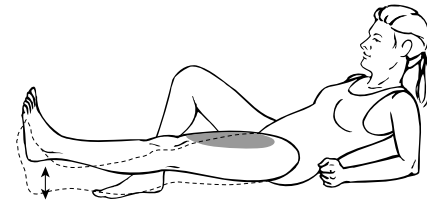


STRENGTH • Quadriceps, Short Arcs

1. Lie flat or sit with your leg straight.
2. Place a _____ inch roll under your knee, allowing it to bend.
3. Tighten the muscle in the front of your knee as much as you can, and lift your heel off the floor.
4. Hold this position for _____ seconds.
5. Repeat exercise _____ times, _____ times per day.

Additional Weights: OK TO USE DO NOT USE!!!

If okay'd by your physician, physical therapist, or athletic trainer, a _____ pound weight may be placed around your ankle for additional weight.



STRENGTH • Quadriceps, 7 Count

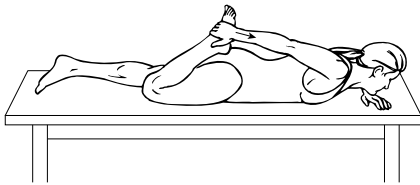
The quality of the muscle contraction in this exercise is what counts the most, not just the ability to lift your leg!

1. Tighten the muscle in front of your thigh as much as you can, pushing the back of your knee flat against the floor.
2. Tighten this muscle *harder*.
3. Lift your leg/heel 4 to 6 inches off the floor.
4. Tighten this muscle *harder again*.
5. Lower your leg/heel back to the floor. Keep the muscle in front of your thigh as tight as possible.
6. Tighten this muscle *harder again*.
7. Relax.
8. Repeat exercise _____ times, _____ times per day.

> RANGE OF MOTION AND STRETCHING EXERCISES • Posterior Cruciate Ligament Tear—Phase II

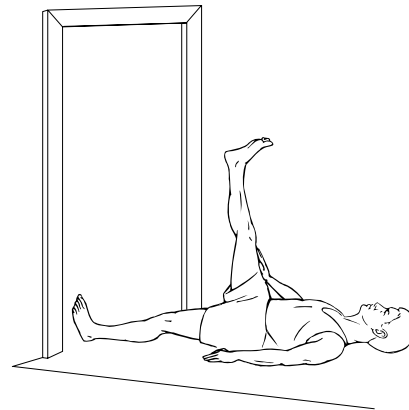
These are some of the exercises you may *progress to* during your rehabilitation program. These exercises will be started at the discretion of your physician, physical therapist, or athletic trainer. *Do not progress to these until you have been authorized to do so by our physician, physical therapist, or athletic trainer.* You may also continue doing all exercises started in Phase I. Please remember:

- Flexible tissue is more tolerant of the stresses placed on it during activities.
- Each stretch should be held for 20 to 30 seconds.
- A *gentle* stretching sensation should be felt.



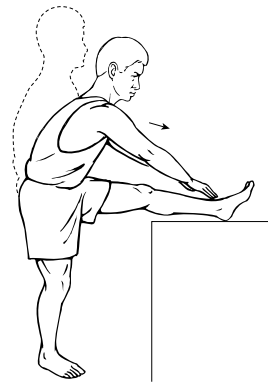
STRETCH • Quadriceps, Prone

1. Lie on your stomach as shown.
2. Bend your knee, grasping your toes, foot, or ankle. If you are too “tight” to do this, loop a belt or towel around your ankle and grasp that.
3. Pull your heel toward your buttock until you feel a stretching sensation in the front of your thigh.
4. Keep your knees together.
5. Hold this position for _____ seconds.
6. Repeat exercise _____ times, _____ times per day.



FLEXIBILITY • Hamstrings, Doorway

1. Lie on your back near the edge of a doorway as shown.
2. Place the leg you are stretching up the wall keeping your knee straight.
3. Your buttock should be as close to the wall as possible and the other leg should be kept flat on the floor.
4. You should feel a stretch in the back of your thigh.
5. Hold this position for _____ seconds.
6. Repeat exercise _____ times, _____ times per day.



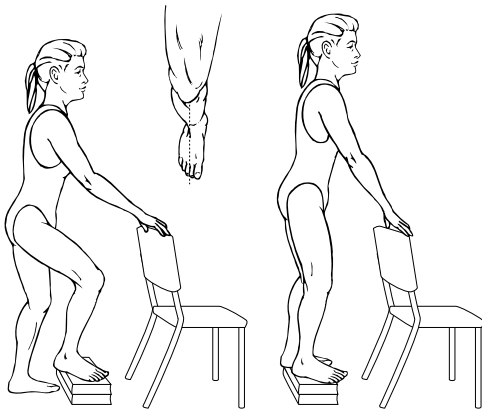
FLEXIBILITY • Hamstrings, Ballet

1. Stand and prop the leg you are stretching on a chair, table, or other stable object.
2. Place both hands on the outside of the leg you are stretching.
3. Make sure that your hips/pelvis are also facing the leg you are stretching.
4. Slide your hands down the outside of your leg.
5. Lead with your chest/breast bone. Keep your chest upright and back straight. Do not hunch over at the shoulders. Keep your toes pointing up.
6. You should feel a stretch in the back of your thigh.
7. Hold this position for _____ seconds.
8. Repeat exercise _____ times, _____ times per day.

> **STRENGTHENING EXERCISES** • Posterior Cruciate Ligament Tear—Phase II

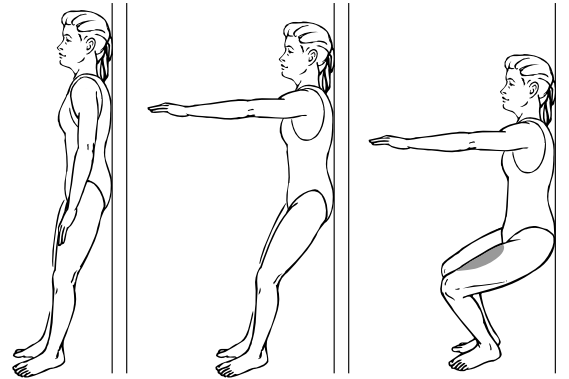
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- Strong muscles with good endurance tolerate stress better.
- Do the exercises as *initially* prescribed by your physician, physical therapist, or athletic trainer. Progress slowly with each exercise, gradually increasing the number of repetitions and weight used under their guidance.



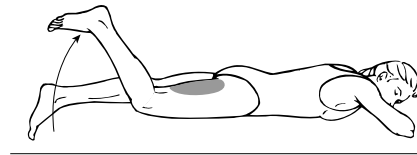
STRENGTH • Quadriceps, Step-Ups

1. Use a step or books.
2. Place your foot on the step or books approximately _____ inches in height. Make sure that your kneecap is in line with the tip of your shoe or your second toe.
3. Hold on to a hand rail, chair, wall, or another object for balance if needed.
4. Slowly step up and down. Make sure that the kneecap is always in line with the tip of your shoe or your second toe. Lightly touch the heel of the opposite leg to the floor and return to the starting position.
5. Repeat exercise _____ times, _____ times per day.



STRENGTH • Quadriceps, Wall Slide

1. Stand with your back against the wall. Your feet should be shoulder-width apart and approximately 18 to 24 inches away from the wall. Your kneecaps should be in line with the tip of your shoes or your second toe.
2. Slowly slide down the wall so that there is a _____ degree bend in your knees. (*Your physician, physical therapist, or athletic trainer will instruct you how to progress the amount of bend based on your symptoms and diagnosis.*)
3. Hold this position for _____ seconds. Stand up and rest for _____ seconds.
4. Repeat exercise _____ times, _____ times per day.

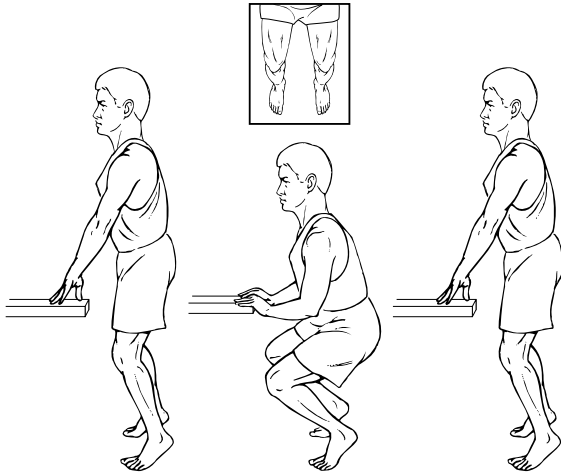


STRENGTH • Hamstring, Curls

1. Lie on your stomach with your legs out straight.
2. Bend knee to 90 degrees. Hold this position for _____ seconds.
3. Slowly lower your leg back to the starting position.
4. Repeat exercise _____ times, _____ times per day.

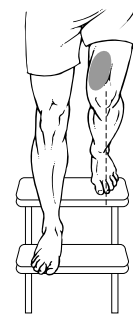
Additional Weights: OK TO USE DO NOT USE!!!

If okay'd by your physician, physical therapist, or athletic trainer, a _____ pound weight may be placed around your ankle for additional weight.



STRENGTH • Quads

1. Stand with your feet shoulder-width apart and place equal weight on both legs.
2. Keep your kneecaps in line with your toes.
3. Slowly bend both knees, keeping *equal weight* on both legs, and return to a standing position.
4. ***Do not bend your knees more than 90 degrees.***
5. You may use the edge of a table or counter for balance if needed.
6. Repeat exercise _____ times, _____ times per day.



STRENGTH • Quads

1. Stand on the edge of a step/stair with your kneecap in line with your second toe.
2. Slowly step down and touch the heel of your opposite leg on the stair below you. Return to the starting position.
3. Do not go into a painful range. Stop short of the step if necessary to avoid any pain.
4. Use your stair rails for balance as needed.
5. Repeat exercise _____ times, _____ times per day.

Notes:

(Up to 4400 characters only)

Notes and suggestions