



Excessive Lateral Patellar Compression Syndrome (Chondromalacia Patella)

Exercises
10 seconds
10 times
1 time per day

DESCRIPTION

Excessive lateral patellar compression syndrome is characterized by pain in the knee due to increased pressure from the kneecap, called the *patella*. This condition usually occurs without injury, although it may follow injury to the knee. The patella is a V-shaped bone that sits in a groove (trochlea) of the thigh bone. The kneecap is a bone within the tendon of the quadriceps muscles of the thigh. The patella usually stays within the groove in the thigh bone because of muscle forces and ligament-like tissue called *retinaculum*.

COMMON SIGNS AND SYMPTOMS

- Diffuse knee pain, usually in the front half of the knee, behind the kneecap, or in the very back of the knee; pain may also occur above or below the kneecap.
- Pain that worsens with sitting for long periods, on arising from a sitting position, going up or down stairs or hills, kneeling, squatting, or wearing shoes with heels
- Pain with jumping
- Usually achy pain, but the pain may be sharp
- Giving way or catching of the knee
- Minimal or no swelling and no locking

CAUSES

Chondromalacia patella usually occurs without injury, although it may follow an injury to the knee. Weakness of the quadriceps muscles, which follows knee swelling or injury, results in poor tracking of the kneecap. Poor tracking also occurs in individuals with poor alignment of the thigh and leg. This poor tracking results in pressure being concentrated on the outer part of the kneecap as opposed to being distributed over the entire kneecap. The retinaculum on the inner part of the knee is stretched, and the retinaculum on the outer part of the knee shortens over time. The pain is worse when the knee is bent or when the quadriceps muscle is active; each creates force on the patella.

FACTORS THAT INCREASE RISK

- Tight hamstring (back of the thigh), quadriceps (front of the thigh), or calf muscles; weak quadriceps muscles
- Inadequate warm-up before practice or competition
- Sports that involve running, jumping, or squatting
- Poor alignment of the legs, such as with kneecaps that point toward each other when the feet are straight ahead (knock-kneed)
- A poorly formed trochlea (a birth defect)
- Flat feet

- Previous injury or surgery to the knee
- Direct injury to the kneecap, such as falling on the kneecap

PREVENTIVE MEASURES

- Appropriately warm up and stretch before practice and competition.
- Maintain appropriate conditioning that includes thigh, knee, and calf flexibility along with muscle strength and endurance training.
- Use arch supports (orthotics) and kneepads.

EXPECTED OUTCOME

Chondromalacia patella is usually curable with appropriate treatment. Complete healing is quickest with rest from the offending activity, although continued sports and aggravating activity does not usually lead to irreversible problems or damage.

POSSIBLE COMPLICATIONS

- Frequent recurrence of symptoms and disability severe enough to diminish an athlete's competitive ability
- Arthritis of the kneecap
- Kneecap dislocations
- Risks of surgery, including infection, bleeding, injury to nerves (numbness, weakness, paralysis), knee stiffness, dislocation of the kneecap, weakness, continued pain, compartment syndrome (when surgery is performed to cut the bone of the leg and move it)

GENERAL TREATMENT CONSIDERATIONS

Initial treatment consists of medications and ice to relieve pain and reduce inflammation, stretching and strengthening exercises, and modification of the activity that produces the symptoms. Exercises may be carried out at home, although occasionally referral to a physical therapist or athletic trainer may be indicated. Icing the knee after exercise is helpful, and your physician may recommend bracing with a knee sleeve to help the kneecap track properly. Arch supports (orthotics) are helpful for people with flat feet. Surgery may be required if symptoms persist despite conservative treatment, and surgery may be done with or without the use of arthroscopy, by cutting the retinaculum on the outer side of the knee (lateral release) with or without tightening the retinaculum on the inner side of the knee. Surgery to cut and move the tibial tubercle, at the insertion of the patellar tendon into the bone, may be required.

MEDICATION

- Nonsteroidal antiinflammatory medications, such as aspirin and ibuprofen (do not take for 7 days before surgery), or other minor pain relievers, such as acetaminophen, are often recommended. Take these as directed by your physician, and contact your doctor immediately if any bleeding, stomach upset, or signs of an allergic reaction occur.
- Stronger pain relievers may be prescribed as necessary, usually only after surgery. Use these only as directed, and take only as much as you need.
- Injections of corticosteroids may be given to reduce inflammation, but this is uncommon.

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.
- Use heat before performing stretching and strengthening activities prescribed by your physician or physical therapist. Use a heat pack or a warm soak.

WHEN TO CALL YOUR DOCTOR

- Symptoms get worse or do not improve in 6 to 8 weeks despite treatment.
- Any of the following occur after surgery:
Pain, numbness, coldness, or discoloration (blue, gray, or dusky) in the foot
Fever, increased pain, swelling, redness, drainage, or bleeding in the surgical area
- New, unexplained symptoms develop. Drugs used in treatment may produce side effects.

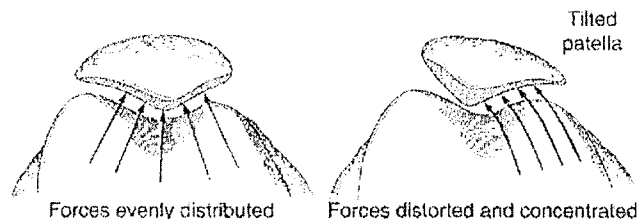


FIGURE 1 From Scuderi GR, McCann PD, Bruno PJ: *Sports medicine: principles of primary care*, St Louis, 1997, Mosby, p 368.

RANGE OF MOTION AND STRETCHING EXERCISES

Excessive Lateral Patellar Compression Syndrome

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 or your symptoms resolve. If any of these exercises causes pain or discomfort stop them and consult your physician, physical therapist, or athletic trainer. Please remember:

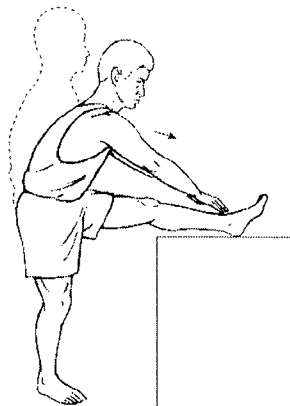
- Flexible tissue is more tolerant of the stresses placed on it during activities.
- Each stretch should be held for 20 to 30 seconds.
- A *gentle* stretching sensation should be felt.



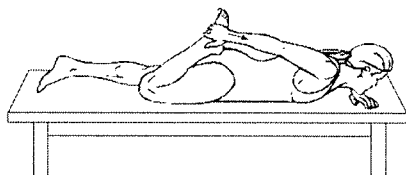
FLEXIBILITY • Patellar Self-Mobilization

1. Sit with your knee bent 75 to 90 degrees and your foot flat on the floor.
2. Place the inside half of your palm near your thumb on top of the inside half of your kneecap.
3. Press down on the inside half of your kneecap, attempting to lift the outside edge up, stretching the fibers that are tight. You should feel a slight stretching sensation on the outside edge of your kneecap.
4. Hold this position for ____ seconds.
5. Repeat this exercise ____ times, ____ times per day.

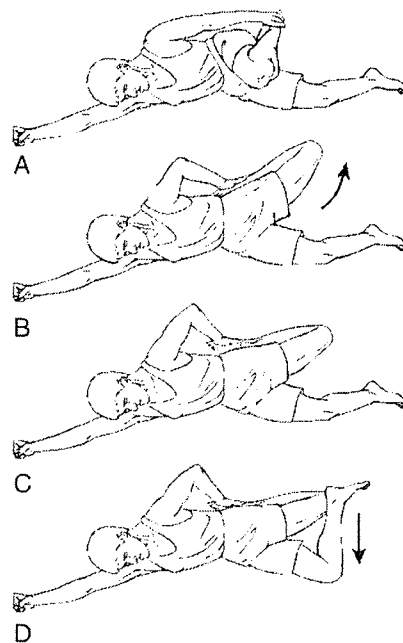
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**FLEXIBILITY • Hamstrings, Ballet**

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, and make sure that your hips are also facing that leg.
3. Slide your hands down the outside of your leg, leading with your chest and keeping it upright and your back straight. Do not hunch over at the shoulders, and keep your toes pointing up. You should feel a stretch in the back of your thigh.
4. Hold this position for ____ seconds.
5. Repeat this exercise ____ times, ____ times per day.

**FLEXIBILITY • Quadriceps Stretch**

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

**FLEXIBILITY • Iliotibial Band Stretch**

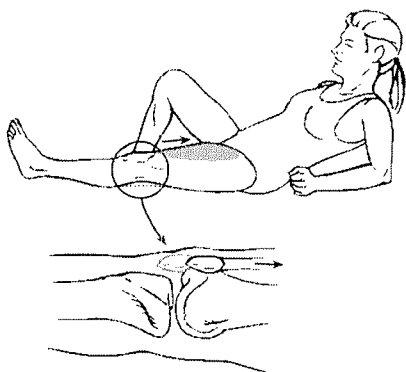
1. Lie on your side as shown. The muscle and iliotibial band to be stretched should be on top.
2. With your hand, grasp your ankle, pull your heel to your buttocks, and bend your hip so that your knee is pointing forward as in the top drawing (A).
3. Rotate your hip up so that your thigh is away from your body as shown and in line with your body. Keep your heel to your buttocks (B).
4. Bring your thigh back down and behind your body. Do not bend at the waist, and keep your heel pressed to your buttocks (C).
5. Place the heel of your opposite foot on top of your knee, and pull your knee down farther. You should feel a stretch on the outside of your thigh near your kneecap (D).
6. Hold this position for ____ seconds.
7. Repeat this exercise ____ times, ____ times per day.

STRENGTHENING EXERCISES**Excessive Lateral Patellar Compression Syndrome**

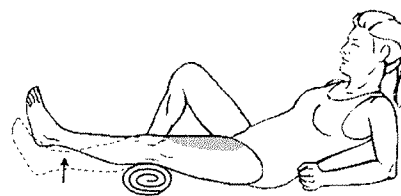
These are some of the *initial* exercises you may start your rehabilitation program with until you see your physician, physical therapist, or athletic trainer again or your symptoms resolve. Please remember:

- 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.

If bending your knees while bearing weight causes pain, stop the exercise and consult your physician, physical therapist, or athletic trainer.

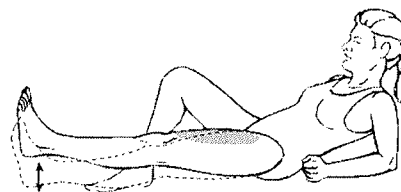
**STRENGTH • Quadriceps, Isometric**

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 this exercise ____ times, ____ times per day.

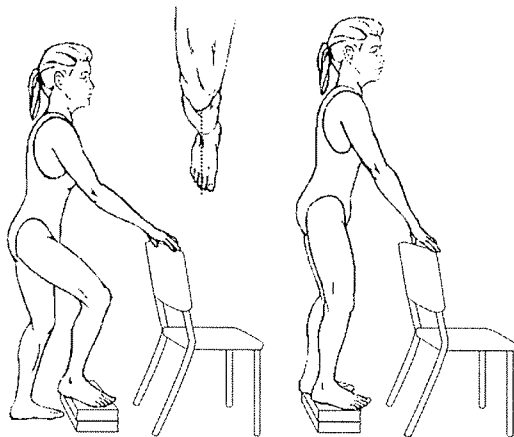
If authorized by your physician, physical therapist, or athletic trainer, a ____ pound weight may be placed around your ankle for additional weight.

**STRENGTH • Quadriceps, Seven Count**

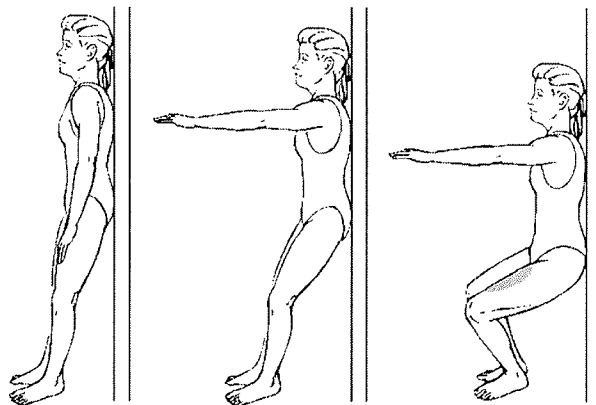
The quality of the muscle contraction in this exercise is what counts, not just your ability to lift the leg.

1. Tighten the muscle in the front of your thigh as much as you can, pushing the back of your knee flat against the floor.
2. Tighten this muscle *harder*, and lift your heel 4 to 6 inches off the floor.
3. Tighten the muscle *even harder*, and lower your heel back to the floor. Keep the muscle in the front of your thigh as tight as possible.
4. Tighten the muscle *harder*, then relax.
5. Repeat this exercise ____ times, ____ times per day.

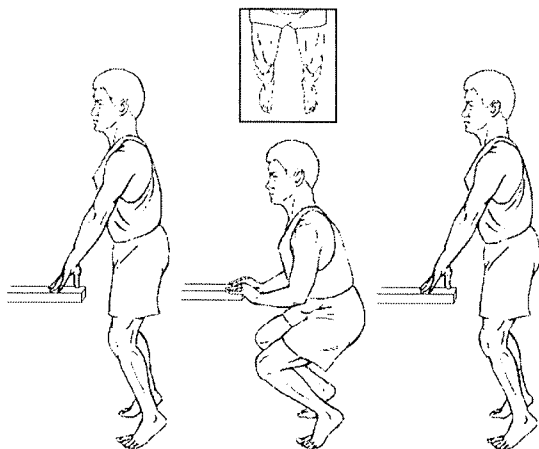
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**STRENGTH ■ Quadriceps, Step-ups**

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



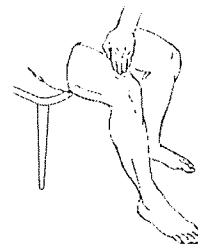
STRENGTH • Quadriceps

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



STRENGTH • Quadriceps

1. Stand on the edge of a step. *Make sure your kneecap is in line with your second toe.*
2. Slowly step down and touch the heel of your opposite leg on the ground 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, and use a handrail or other sturdy object for balance as needed.
4. Repeat this exercise _____ times, _____ times per day.



STRENGTH • Quadriceps, Isometric

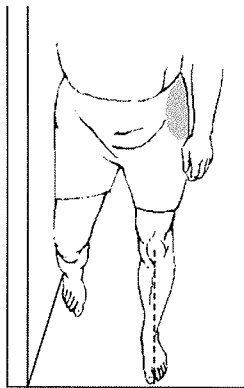
1. Sit in a chair with your knee bent 75 to 90 degrees as shown.
2. With your fingertips, feel the muscle just above the kneecap on the inside half of your thigh. This muscle is called the *vastus medialis obliquus*, or VMO.
3. Push your foot and leg into the floor to cause the thigh muscles to tighten. Concentrate on feeling the VMO tighten; this muscle is important, because it helps control the position of your kneecap.
4. Tighten and hold for _____ seconds.
5. Repeat this exercise _____ times, _____ times per day.



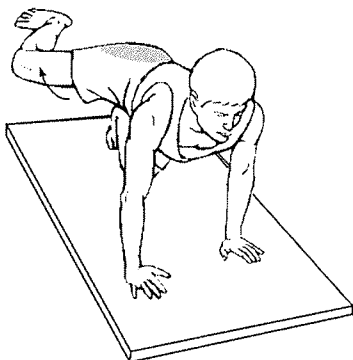
STRENGTH • Hip Abduction

1. Lie on your side as shown with your weak leg on top.
2. Bend the bottom knee slightly for balance, and roll your top hip slightly forward.
3. Lift your top leg straight up, leading with your heel. Do not let the leg come forward.
4. Hold this position for _____ seconds, and *slowly* lower your leg to the starting position.
5. Repeat this exercise _____ times, _____ times per day.

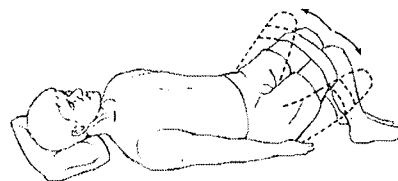
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**STRENGTH • Hip Abduction**

1. Stand next to the wall with the knee of your uninjured leg bent to 90 degrees. Place your leg against the wall as shown, and make sure that your kneecap is in line with the toes of the leg you are standing on.
2. Push your bent knee of the leg that is against the wall into the wall, and do not let your body move away from the wall; to do this, the hip muscles of the injured leg (shaded area) will have to contract.
3. Hold this position for ____ seconds.
4. Repeat this exercise ____ times, ____ times per day.

**STRENGTH • Hip Abduction in Quadruped**

1. Get on your hands and knees and into the position shown.
2. Keeping your knee bent, lift it up and out to the side. Hold this position for ____ seconds.
3. Slowly lower your knee to the starting position.
4. Repeat this exercise ____ times, ____ times per day.

**STRENGTH • Hip External Rotation**

1. Lie on your back with your hips and knees bent and your feet together, flat on the floor.
2. Place an elastic band around your legs at your knees as shown.
3. Spread your knees apart, keeping your feet together.
4. Hold this position for ____ seconds.
5. Repeat this exercise ____ times, ____ times per day.

