



CENTRAL TEXAS PEDIATRIC ORTHOPEDICS

Sports Medicine

ANTERIOR KNEE PAIN



■ ■ ■ Description

Chondromalacia patella is characterized by pain in the knee due to increased pressure from the kneecap (patella). This 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 (thigh). The patella stays within the groove in the thigh bone because of muscle forces and ligament-like tissue (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 be above or below the kneecap
- Pain that worsens with sitting for long periods, arising from a sitting position, going up or down stairs or hills, kneeling, squatting, or wearing shoes with heels
- Often, pain with jumping
- Usually achy pain but may be sharp
- Giving way, catching of the knee
- Minimal or no swelling, no locking

■ ■ ■ Causes

This condition 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 whole thigh and leg. The poor tracking results in pressure being concentrated on the outer part of the kneecap (as opposed to being distributed over the whole kneecap). The retinaculum on the inner part of the knee is stretched while the retinaculum on the outer part of the knee shortens with time. The pain is worse when the knee is bent or when the quadriceps muscle is active or both (each causing force on the patella).

■ ■ ■ Risk Increases With

- Tight hamstring (back of the thigh), quadriceps (front of thigh), or calf muscles; weak quadriceps (front of the thigh) muscles
- Inadequate warm-up before practice or competition
- Sports that involve running, jumping, or squatting
- Poor alignment of the legs (knock knees, kneecaps that point toward each other when the feet are straight ahead), poorly formed trochlea (something you are born with), flat feet
- Previous injury or surgery to the knee
- Direct injury to the kneecap (falling on the kneecap)

■ ■ ■ Preventive Measures

- Appropriately warm up and stretch before practice and competition.
- Maintain appropriate conditioning:
 - Thigh, knee, and calf flexibility
 - Muscle strength and endurance
- Use arch supports (orthotics), knee pads.

■ ■ ■ Expected Outcome

Usually curable with appropriate treatment. Complete healing is quickest with rest from 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. These 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. Occasionally your physician may recommend bracing with a knee sleeve to help the kneecap track properly. Arch supports (orthotics) are helpful for those with flat feet. Surgery may be required if symptoms persist despite conservative treatment. This 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. Occasionally surgery to cut the tibial tubercle (insertion of the patellar tendon into bone) and move it may be required.

■ ■ ■ 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, usually only after surgery. Use only as directed and only as much as you need.
- Injections of corticosteroids may uncommonly be given to reduce inflammation.

■ ■ ■ 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.

■ ■ ■ Notify Our Office If

- 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)

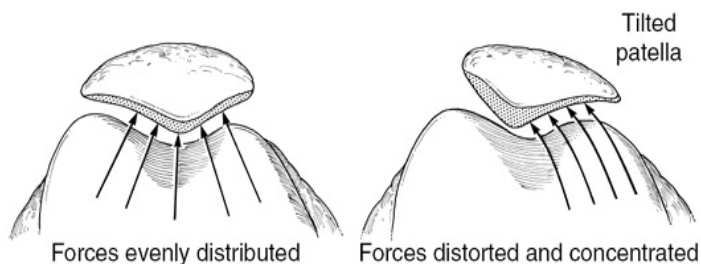


Figure 1

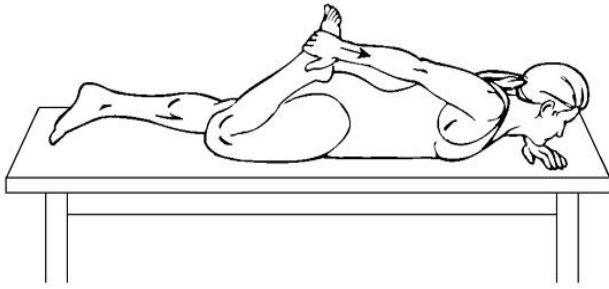
From Scuderi GR, McCann PD, Bruno PJ: Sports Medicine: Principles of Primary Care. St. Louis, Mosby, 1997, p. 368.

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

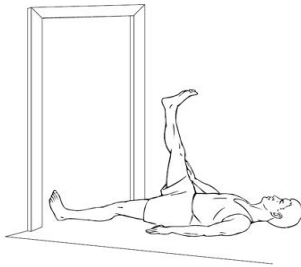
- Flexible tissue is more tolerant of the stresses placed on it during activities.
- Each stretch should be held for 20 to 30 seconds.

A *gentle* stretching sensation should be felt.



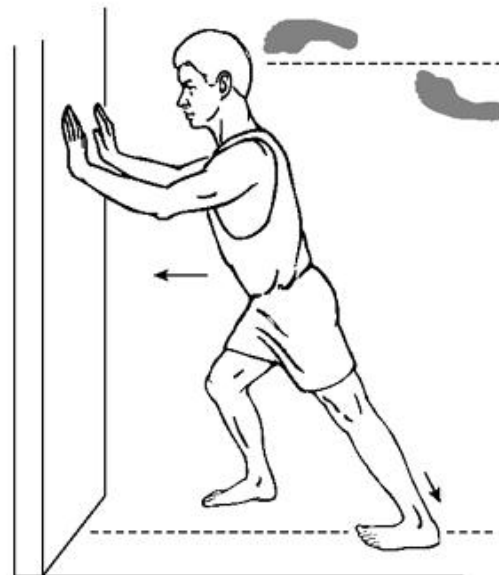
STRETCH • Quadriceps, Prone

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 **30** seconds.
6. Repeat exercise **2** times, **2** 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 **30** seconds.
6. Repeat exercise **2** times, **2** times per day.

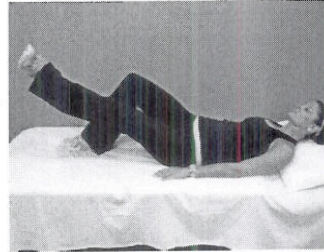
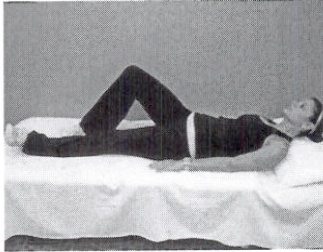


STRETCH • Gastrocnemius

1. Stand *one* arm length from the wall as shown. Place calf muscle to be stretched behind you as shown.
2. Turn the *toes in* and *heel out* of the leg to be stretched.
3. Lean toward wall leading with your waist, allowing your arms to bend. **Keep your heel on the floor.**
4. First do this exercise with the knee straight, then bend the knee slightly. Keep your heel on the floor at all times.
5. Hold this position for 30 seconds.
6. Repeat exercise 2 times, times per day.

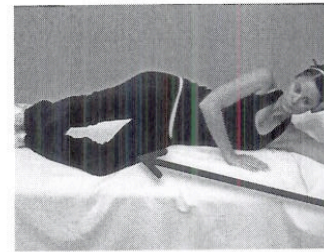
Straight Leg Raise With Toes Turned Outward:

Lie on your back and bend your uninjured leg with the foot supported on the ground. Keep your injured leg straight and point your toes away from you. Tighten your thigh muscle and slowly raise your injured leg 10-15 inches. Slowly return to the ground. Perform 3 sets of 10.



Clamshells:

Lie on your side with your injured leg on top. Position your hips so one is directly on top of the other. Do not let your top hip slide backward when performing the exercise. Bend your knees to 45 degrees. Open the legs similar to a clamshell and hold the position for 10 seconds. Repeat 10 times. COUNT SLOWLY!



To increase difficulty you can place a TheraBand® loop around the knees. Continue to hold for 10 seconds. Repeat 10 times.

Central
1301 Barbara Jordan Blvd.
Suite 300
Austin, TX 78723

Cedar Park
1301 Medical Pkwy.
Suite 330
Cedar Park, TX 78613

Four Points (PT only)
6911 N FM 620
Suite C200
Austin, TX 78732

Westlake (PT only)
3532 Bee Caves Rd.
Suite 110
Austin, TX 78746

South (PT only)
1807 W. Slaughter Lane
Suite 600
Austin, TX 78748

512-478-8116
512-478-9368 (fax)
www.ctpmd.com



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Physical Therapy