

# Runner's Knee: Teen Version

## What is runner's knee?

Runner's knee is pain behind the kneecap. It may also be called patellofemoral disorder, patellar malalignment, patellofemoral pain syndrome, and chondromalacia.

## How does it occur?

Runner's knee can occur from overuse of the knee in sports and activities such as running, walking, jumping, or bicycling.

The kneecap (patella) is attached to the large group of muscles in the thigh called the quadriceps. It is also attached to the shin bone by the patellar tendon. The kneecap fits into grooves in the end of the thigh bone (femur) called the femoral condyle. With repeated bending and straightening of the knee, you can irritate the inside surface of the kneecap and cause pain.

Runner's knee also may result from the way your hips, legs, knees, or feet are aligned. For example, if you have wide hips or underdeveloped thigh muscles, or if you are knock-kneed You may also have this problem if your foot flattens too much when you walk or run (a condition called over-pronation).

## What are the symptoms?

The main symptom is pain behind the kneecap. You may have pain when you walk, run, or sit for a long time. The pain is usually worse when you walk downhill or down stairs. Your knee may swell at times. You may feel or hear snapping, popping, or grinding in the knee.

## How is it diagnosed?

Your healthcare provider will review your symptoms and examine your knee. You will have knee X-rays. You may have an MRI to check for damage to the surface of the patella or femur or another injury.

## How is it treated?

Treatment includes the following:

- Put an ice pack, gel pack, or package of frozen vegetables, wrapped in a cloth on the area every 3 to 4 hours, for up to 20 minutes at a time.
- Raise the knee on a pillow when you sit or lie down.
- Take an anti-inflammatory medicine such as ibuprofen, or other medicine as directed by your provider. Nonsteroidal anti-inflammatory medicines (NSAIDs) may cause stomach

bleeding and other problems. These risks increase with age. Read the label and take as directed. Unless recommended by your healthcare provider, do not take for more than 10 days.

- Follow your provider's instructions for doing exercises to help you recover. Your healthcare provider will show you exercises to help decrease the pain behind your kneecap.
- If you over-pronate, your healthcare provider may recommend shoe inserts, called orthotics. You can buy orthotics at a pharmacy or athletic shoe store or they can be custom-made.
- Use an infrapatellar strap, a strap placed below the kneecap over the patellar tendon.
- Wear a neoprene knee sleeve, which will give support to your knee and patella.

While you recover from your injury, you will need to change your sport or activity to one that does not make your condition worse. For example, you may need to bicycle or swim instead of run.

In cases of severe patellofemoral pain syndrome, surgery may be recommended.

## **How long will the effects last?**

Pain behind the kneecap often lasts a long time and can come back after symptoms were better for a while. Treatment requires proper rehabilitation exercises that are done regularly.

## **When can I return to my normal activities?**

Everyone recovers from an injury at a different rate. Return to your activities depends on how soon your knee recovers, not by how many days or weeks it has been since your injury has occurred. In general, the longer you have symptoms before you start treatment, the longer it will take to get better. The goal is to return you to your normal activities as soon as is safely possible. If you return too soon you may worsen your injury.

You may safely return to your normal activities 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.
- You are able to walk, bend, and squat without pain.

## **How can I prevent runner's knee?**

Runner's knee can best be prevented by strengthening your thigh muscles, particularly the inside part of this muscle group. It is also important to wear shoes that fit well and that have good arch supports.

# Runner's Knee Exercises

You can do the hamstring stretch right away. When your knee is less painful, you can do the quadriceps stretch and start strengthening the thigh muscles with the rest of the exercises.

- **Standing hamstring stretch:** Put the heel of the leg on your injured side on a stool about 15 inches high. Keep your leg straight. Lean forward, bending at the hips, until you feel a mild stretch in the back of your thigh. Make sure you don't roll your shoulders or bend at the waist when doing this or you will stretch your lower back instead of your leg. Hold the stretch for 15 to 30 seconds. Repeat 3 times.
- **Quadriceps stretch:** Stand an arm's length away from the wall with your injured leg farthest from the wall. Facing straight ahead, brace yourself by keeping one hand against the wall. With your other hand, grasp the ankle of your injured leg and pull your heel toward your buttocks. Don't arch or twist your back. Keep your knees together. Hold this stretch for 15 to 30 seconds.
- **Side-lying leg lift:** Lie on your uninjured side. Tighten the front thigh muscles on your injured leg and lift that leg 8 to 10 inches away from the other leg. Keep the leg straight and lower it slowly. Do 2 sets of 15.
- **Quad sets:** Sit on the floor with your injured leg straight and your other leg bent. Press the back of the knee of your injured leg against the floor by tightening the muscles on the top of your thigh. Hold this position 10 seconds. Relax. Do 2 sets of 15.
- **Straight leg raise:** Lie on your back with your legs straight out in front of you. Bend the knee on your uninjured side and place the foot flat on the floor. Tighten the thigh muscle on your injured side and lift your leg about 8 inches off the floor. Keep your leg straight and your thigh muscle tight. Slowly lower your leg back down to the floor. Do 2 sets of 15.
- **Step-up:** Stand with the foot of your injured leg on a support 3 to 5 inches high (like a small step or block of wood). Keep your other foot flat on the floor. Shift your weight onto the injured leg on the support. Straighten your injured leg as the other leg comes off the floor. Return to the starting position by bending your injured leg and slowly lowering your uninjured leg back to the floor. Do 2 sets of 15.
- **Wall squat with a ball:** Stand with your back, shoulders, and head against a wall. Look straight ahead. Keep your shoulders relaxed and your feet 3 feet from the wall and shoulder's width apart. Place a soccer or basketball-sized ball behind your back. Keeping your back against the wall, slowly squat down to a 45-degree angle. Your thighs will not yet be parallel to the floor. Hold this position for 10 seconds and then slowly slide back up the wall. Repeat 10 times. Build up to 2 sets of 15.
- **Knee stabilization:** Wrap a piece of elastic tubing around the ankle of your uninjured leg. Tie a knot in the other end of the tubing and close it in a door at about ankle height.
  1. Stand facing the door on the leg without tubing and bend your knee slightly, keeping your thigh muscles tight. Stay in this position while you move the leg with the tubing straight back behind you. Do 2 sets of 15.
  2. Turn 90 degrees so the leg without tubing is closest to the door. Move the leg with tubing away from your body. Do 2 sets of 15.

3. Turn 90 degrees again so your back is to the door. Move the leg with tubing straight out in front of you. Do 2 sets of 15.
4. Turn your body 90 degrees again so the leg with tubing is closest to the door. Move the leg with tubing across your body. Do 2 sets of 15.

Hold onto a chair if you need help balancing. This exercise can be made more challenging by standing on a firm pillow or foam mat while you move the leg with tubing.

- **Resisted terminal knee extension:** Make a loop with a piece of elastic tubing by tying a knot in both ends. Close the knot in a door at knee height. Step into the loop with your injured leg so the tubing is around the back of your knee. Lift the other foot off the ground and hold onto a chair for balance, if needed. Bend the knee with tubing about 45 degrees. Slowly straighten your leg, keeping your thigh muscle tight as you do this. Repeat 15 times. Do 2 sets of 15. If you need an easier way to do this, stand on both legs for better support while you do the exercise.
- **Standing calf stretch:** Stand facing a wall with your hands on the wall at about eye level. Keep your injured leg back with your heel on the floor. Keep the other leg forward with the knee bent. Turn your back foot slightly inward (as if you were pigeon-toed). Slowly lean into the wall until you feel a stretch in the back of your calf. Hold the stretch for 15 to 30 seconds. Return to the starting position. Repeat 3 times. Do this exercise several times each day.
- **Clam exercise:** Lie on your uninjured side with your hips and knees bent and feet together. Slowly raise your top leg toward the ceiling while keeping your heels touching each other. Hold for 2 seconds and lower slowly. Do 2 sets of 15 repetitions.
- **Iliotibial band stretch, side-bending:** Cross one leg in front of the other leg and lean in the opposite direction from the front leg. Reach the arm on the side of the back leg over your head while you do this. Hold this position for 15 to 30 seconds. Return to the starting position. Repeat 3 times and then switch legs and repeat the exercise.

Written by Tammy White, MS, PT, and Phyllis Clapis, PT, DHSc, OCS, for RelayHealth.

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This content is reviewed periodically and is subject to change as new health information becomes available. The information is intended to inform and educate and is not a replacement for medical evaluation, advice, diagnosis or treatment by a healthcare professional.

[References](#)

[Pediatric Advisor 2011.2 Index](#)

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# Runner's Knee (Patellofemoral Pain Syndrome) Rehabilitation Exercises



Standing hamstring stretch



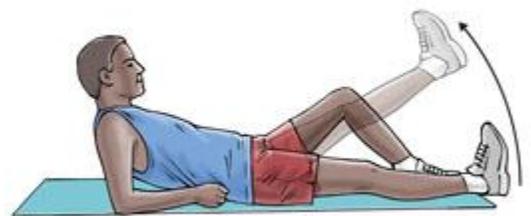
Quadriceps stretch



Side-lying leg lift



Quad sets



Straight leg raise



Prone hip extension



Step-up

# Runner's Knee (Patellofemoral Pain Syndrome) Rehabilitation Exercises



Wall squat with a ball



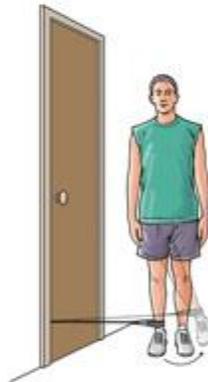
Knee stabilization: A



Knee stabilization: B



Knee stabilization: C



Knee stabilization: D



Resisted terminal knee extension



Standing calf stretch



Clam exercise



Iliotibial band stretch (side-bending)