

Patellofemoral Knee Pain Physical Therapy Program

- Quad sets: With your leg straight out and your foot and ankle resting on a rolled towel, tighten the front of your thigh (quad muscles) and try to push the back of your knee flat down towards the bed. Hold the leg in this position for 10 seconds, then relax.



- Straight leg raises: With leg straight, lift up your leg off the bed about 24 inches, then slowly bring the straight leg back down to the bed. You should use your front thigh (quad) muscles to raise the leg.



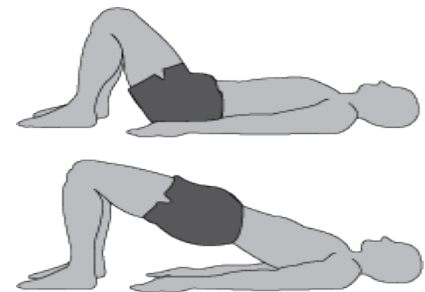
- Gluteal squeezes: While laying flat on your back, squeeze your butt muscles (gluteus maximus) together and hold together for 10 seconds, then relax.



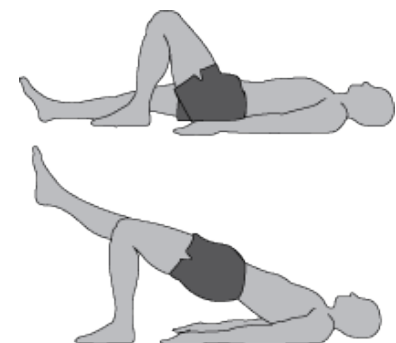
- Wall sits: With your back up against an upright vertical wall, your hips and knees should be flexed about 90 degrees. Hold this position for 20 seconds, then relax by standing back up. Work time up beyond 20 seconds as strength improves.



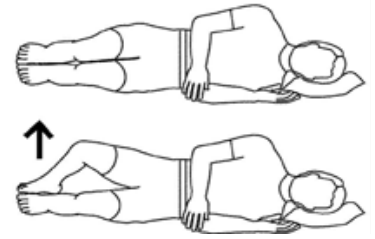
- Double-leg bridge: While laying on your back with your hips and knees flexed about 60 degrees, press your pelvis up into the air, as shown to the right. This should keep your chest, abdomen, and thighs straight, while your knees are flexed about 90 degrees. Focus on squeezing your butt cheeks together throughout the hold. Hold this position for 20 seconds, then relax by coming back to laying on your back. Work time up beyond 20 seconds as strength improves.



- Single-leg bridge: Use a similar starting position while laying on your back as the double-leg bridge. The difference is that one leg is flat on the ground. The first step of the move is to press your pelvis in the air, as shown to the right. This should keep your chest, abdomen, and one thigh straight, while your other knee is flexed about 90 degrees. Focus on squeezing your butt cheeks together throughout the hold. Hold this position for 10 seconds, then relax by coming back to laying on your back. Work time up beyond 10 seconds as strength improves. Remember to do both legs.



- Clamshells: While laying on your side, with both hips about 45 degrees and both knees flexed about 70 degrees, externally rotate the leg up in the air, while keeping the feet close together. All the rotation is coming from the hip. You should feel the outside of your hip contracting. Hold at the top for one second. Slowly release back down to the other knee. Perform 10 reps on each leg.



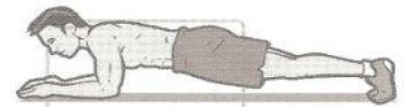
- Supine (laying down) side leg lifts: While laying on your side, with your legs straight out, slowly lift the leg up until you meet resistance. This may range from 45 to 90 degrees, depending on flexibility. Perform 10 reps on each leg. Work the number of reps up as strength improves.



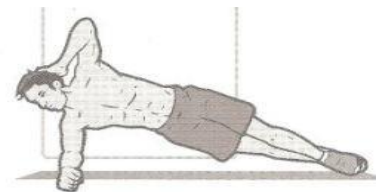
- Standing side leg lifts: While standing on one leg, with your legs straight, slowly lift the leg out to the side until you meet resistance. This may range from 45 to 90 degrees, depending on flexibility. Perform 10 reps on each leg. Work the number of reps up as strength improves.



- Plank: While resting face-down on the floor, begin the exercise by going up on your toes and resting your elbows and forearms on the floor, with elbows directly under the shoulders. Make sure the line of your body goes from the top of your head, straight down your neck, back, butt, legs, to your heels. You should focus on contracting the abs. Hold the plank for 20 seconds, then increase hold time as strength and stability improves. If you are unable to hold a plank for 20 seconds, begin with your knees on the ground, instead of your toes. It is not uncommon for your body to shake while fatiguing from this exercise.



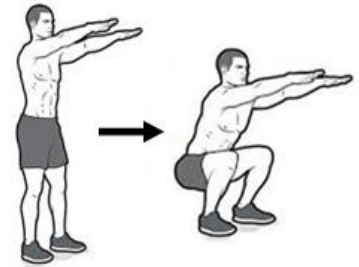
- Side plank: While resting on your side, begin the exercise by going up with your torso, pelvis, and legs off the ground, while resting your body weight on your elbow and forearm and side of foot, as shown here. Your elbow should rest under your shoulder. You should focus on contracting the abs and obliques. Hold the side plank for 20 seconds, then increase hold time as strength and stability improves. If you are unable to hold a side plank for 20 seconds, begin with your knee on the ground, instead of the side of your foot. It is not uncommon for your body to shake while fatiguing from this exercise.



- Single leg stance with butt squeeze: Simply stand on one leg. Hold for 30 seconds. Increase difficulty by closing your eyes. Increase time of hold as strength and stability improve. The most important thing to focus on is having a level pelvis, parallel to the ground. It is best to first have someone watch you the first few times you perform it, to assure your pelvis is flat. You should feel the muscles over the side of the hip contracting (for the leg on the ground). Remember to do both legs.



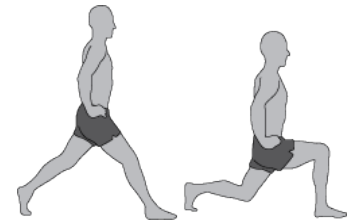
- Double leg squat: Using body-weight only, begin with your feet at shoulder width apart, or slightly wider. As you go down, ensure your lower back remains either straight or arched in. Your lower back should never be arched out. Go down so that your thighs are parallel to the floor. Upon coming back up to standing, focus on squeezing your butt cheeks together and then even thrusting your pelvis forward at the top. It is very helpful to have someone observe your squat form to ensure correct.



- Single leg squat: Using body-weight only, begin with one foot on the ground and the other foot extended out in front of you about 30 degrees, with both hands straight out in front of you. Slowly descend, while keeping your pelvis level, and further extending your foot out in front of you off the ground, until your thighs are parallel to the floor. You should feel like most of your weight is going onto your heel. It is very helpful to have someone observe your squat form to ensure correct. This is an advanced exercise. Increase reps as strength improves.

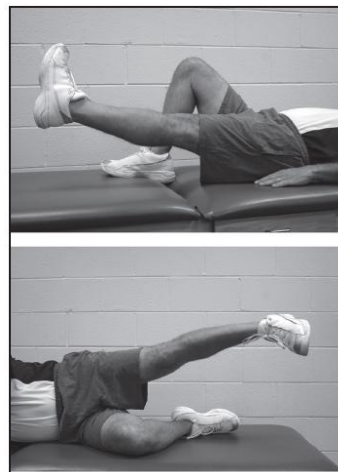


- Forward lunge: Begin standing straight up, with hands on hips, step out with one foot and lunge forward until knee flexed 90 degrees. Do this motion slowly. Then begin to come back up by contracting your quads and gluts. Do this motion slowly. Alternate legs. Do 10 reps on each leg.

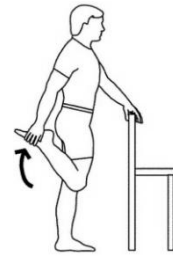


- Eccentric quad strengthening - if patellar tendonitis / tendinopathy

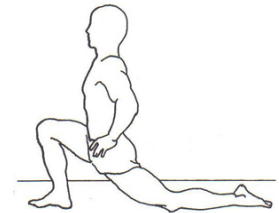
- Decline squats (on 25° decline board) to 45° to 60°: While performing a single-leg stance, slowly perform a single-leg squat to 60°
- Step-downs with increasing height: While performing a single-leg stance, slowly perform a single-leg squat until the heel touches the ground
- "Around the world" 4-way eccentric lowering leg raises: Perform straight-leg raises while laying on your back, laying on each side, and laying on your stomach.



- Quad stretch: While standing on one leg with your hand on a chair, grab your foot/ankle with your other and bend your knee. Remember to stretch both legs. Stretch for 30 seconds.



- Hip flexor stretch: While in the lunge position, slowly lean forward on one leg, while stretching the front of the other hip. Remember to stretch both hips. Stretch for 30 seconds.



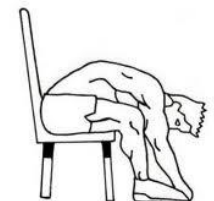
- IT band stretch: While standing, cross left leg behind the right and lean your trunk to the left. This will stretch the outside of the right hip. Stretch for 30 seconds. Next, cross right leg behind the left and lean your trunk to the right. This will stretch the outside of the left hip. Stretch for 30 seconds.



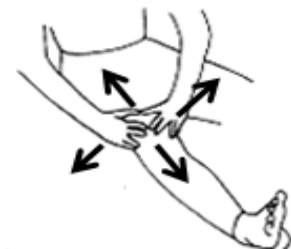
- Hamstring stretch: While laying on your back, stretch each leg individually with a Theraband. Stretch for 30 seconds. While sitting, bend over at the hips and grab your ankles/toes. Stretch for 30 seconds.



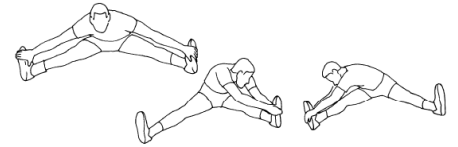
- Low back stretch: While sitting on your knees, bend over at your hips with your arms overhead, and feel the stretch in your lower back. While sitting on a chair, lean over at your hips, try to touch the ground, and feel the stretch in your lower back. Stretch for 30 seconds.



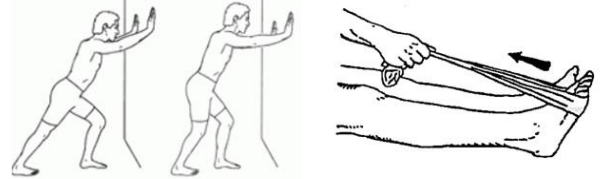
- Patellar mobilization stretch - 4 way: With your leg straight out, use both hands to move your kneecap in four different directions. First, push the kneecap left and hold it for 10 seconds. Next, push the kneecap right and hold it for 10 seconds. Then, push the kneecap towards your toes and hold it for 10 seconds. Finally, pull the knee up towards your hip and hold it for 10 seconds. The total distance moved for each direction should be one inch or less. Remember to stretch both kneecaps.



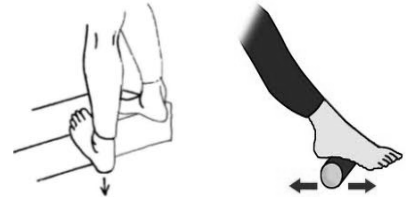
- Groin / hip adductor stretch: While sitting, spread your legs out to the sides as far as comfort permits. Next, begin by bending over at the hips and lower back in between the legs. Hold the stretch for 30 seconds. Then relax for 10 seconds. Then, stretch and relax towards each leg for 30 seconds of stretch and 10 seconds of hold.



- Achilles stretch: While standing, lean up against a wall with your hands at shoulder/head height. With one foot forward toward the wall and one foot backward, slowly lean forward toward the wall and stretch the back foot's Achilles. Make sure the knee is straight out. Stretch for 30 seconds. Then relax for 10 seconds. Next, perform the same stretch, except with the knee bent about 30 degrees. Stretch for 30 seconds, then relax for 10 seconds. Additionally, while sitting, take a Theraband or towel, with your knee straight out, pull your foot back towards your body, as shown. Stretch for 30 seconds. Remember to stretch both legs.



- Plantar fascia stretch: While standing on the edge of a step, slowly inch your foot off the back until you feel the stretch in the bottom of your foot. This will allow the heel to slide off the back and drop towards the floor. You may have to re-adjust to get the position right a couple times. Stretch for 30 seconds on each foot. Additionally, you may use a small foam roller, frozen water bottle, or any cylinder/tube to roll the plantar fascia. Roll for 30 seconds. Remember to stretch both feet.



Things to Avoid:

- Activities that reproduce the pain
- Knee extension machine exercises (open-chain)
- When painful, the elliptical, stair-stepper, step aerobics
- Stairs (either going up or down)
- Sitting, squatting, or kneeling for extended periods of time

Why do I have pain?

- Tight muscles around core, hips, pelvis, thighs, knees
- Weak muscles around core, hips, pelvis, thighs, knees
- Flat feet
- Overuse / repetitive activities
- Improper mechanics running, jumping, squatting, lunging

In addition to therapy exercises, what can I do to help improve the pain?

- Decrease activity (e.g. rest) level until pain gone, or tolerable
- Then, slowly advance activities as symptoms permit
 - (e.g. "if it hurts, don't do it".... "if it doesn't hurt, then do it")
- Oral anti-inflammatory medications (e.g. Advil, Motrin, Aleve, Ibuprofen)
- Strengthening and stretching
 - Improve single-leg standing balance
- Aqua-therapy, water-therapy, swimming
- Warm-up before exercise
- Cool-down after exercise
- Icing at least 4 times / day for 15 minutes at a time, especially after activity
- Deep massage of painful areas
- Weight-loss
- Good shoes with appropriate arch support
- Foam roller over IT (iliotibial band), quads, hamstrings, Achilles
- Neoprene knee sleeve braces, patellar taping, kinesiotaping (if helpful)