

Patellofemoral Knee Pain

Rob Johnson, MD

Director, Primary Care Sports Medicine, Department of Family Practice, Hennepin County Medical Center and Associate Professor, Department of Family Practice and Community Health, University of Minnesota, Minneapolis, MN

General

Patellofemoral syndrome describes a variety of injuries affecting the patella (kneecap) and its groove on the thigh bone. The patella moves up and down in its groove when the knee is extended (straight) or flexed (bent). If repetitive forces acting on the patella during this up-and-down motion are unbalanced, such as with running and jumping, or if the patella moves side-to-side too much, painful symptoms may develop.

Patellofemoral syndrome is the most common knee injury in athletes and physically active adults. Typically, women—especially adolescent females—experience more patellofemoral problems than men. Runner’s knee, biker’s knee, patellofemoral pain syndrome, patellofemoral stress syndrome, patellalgia and chondromalacia patella are just a few of the common terms used to identify this syndrome.

The exact cause of pain is not known. The cartilage that lines the under surface of the kneecap has no nerve endings so pain likely does not originate here. Some experts feel the pain is a result of wear on the bone underlying the cartilage or possibly, breakdown products of injured cartilage.

Symptoms

The injury is usually a result of repetitive running and jumping activity rather than a single traumatic event. Symptoms usually develop gradually with initial pain resembling a dull knee stiffness or ache present early in activity. As you warm up, the stiffness/pain may improve or

disappear. Hours after the workout, symptoms may reappear. As the injury progresses, pain may be present throughout activity. Symptoms may worsen when descending steps or hills. Squatting and kneeling may also aggravate the symptoms. Crepitus (a “crunching” sound under the kneecap with movement of the knee) may also be present. When you sit for an extended time, resuming activity may result in pain and stiffness until the muscles “loosen up.” Those with advanced cases may experience “giving way” in the knee when walking or running.

Diagnosis is dependent on a history of symptoms and pain during specific physical exams. There is no single test that confirms patellofemoral syndrome. In fact, some athletes with this injury may have a completely normal exam. Although, X-rays or other medical imaging techniques of the kneecap joint may be helpful.

Treatment

About 80 percent of all patellofemoral problems can be treated without surgery. Treatment is directed at correcting muscle imbalance, weakness or alignment problems of the lower back, pelvis, hip or lower extremity. Almost all studies of patellofemoral syndrome indicate weakness in the quadriceps (the muscles in the front of the thigh). Appropriate flexibility exercises may also be used. Strengthening hip and abdominal muscles could correct abnormal alignment of the low back, hip and pelvis and relieve patellofemoral strain. Those who pronate excessively (have flat feet) are thought to be at increased risk for patellofemoral injuries. So, treatment may also include orthotics to correct overpronation.

Treatment—Continued

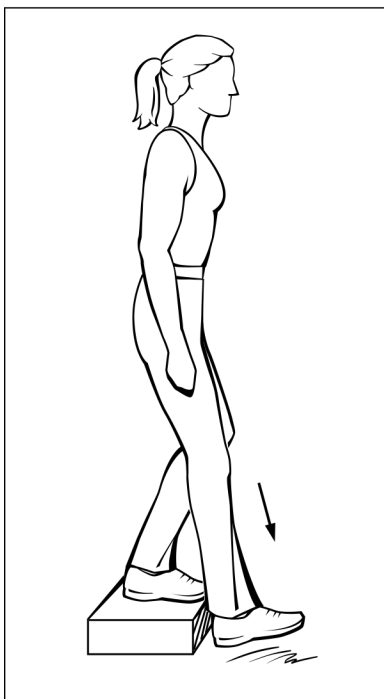
Braces and taping are commonly used to relieve symptoms. They are effective in reducing pain severity, but do not cure the problem. Ice therapy after exercise may relieve symptoms effectively.

Non-steroidal anti-inflammatory drugs (NSAIDs) and acetaminophen reduce pain from this injury. Neither medication is a cure.

Exercises to strengthen the quadriceps and hamstring muscles

Step-Overs (quadriceps)

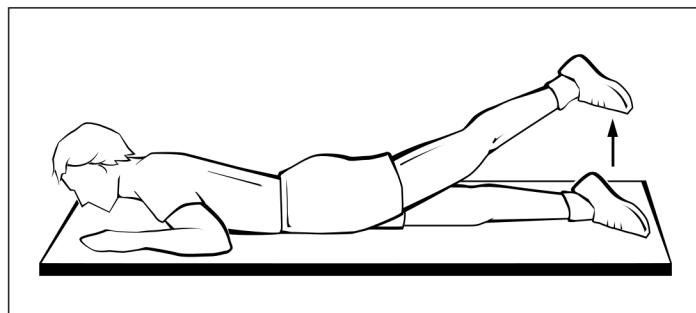
Stand on a step or stack of several phone books. With weight on the injured leg, step slowly off the step with the uninvolved leg. Touch the heel to the step or ground with no weight on the heel. Recover to the starting position. (See example).



Do this exercise for 30–60 seconds for one set. Perform 3 sets.

Prone leg lifts (hamstrings)

Lay face down on the floor. With the knee straight, slowly lift one leg off the floor and hold for a count of five (exercise 1). Lower the leg and perform a similar maneuver with the other leg. Do 3 sets of 20–30 repetitions with each leg.



Next, bend the knee and lift the leg off the floor holding the position for a count of five (exercise 2). Lower the leg and do the same exercise with the other leg. Do 3 sets of 20–30 repetitions.

