

PATELLOFEMORAL SYNDROME

What is it?

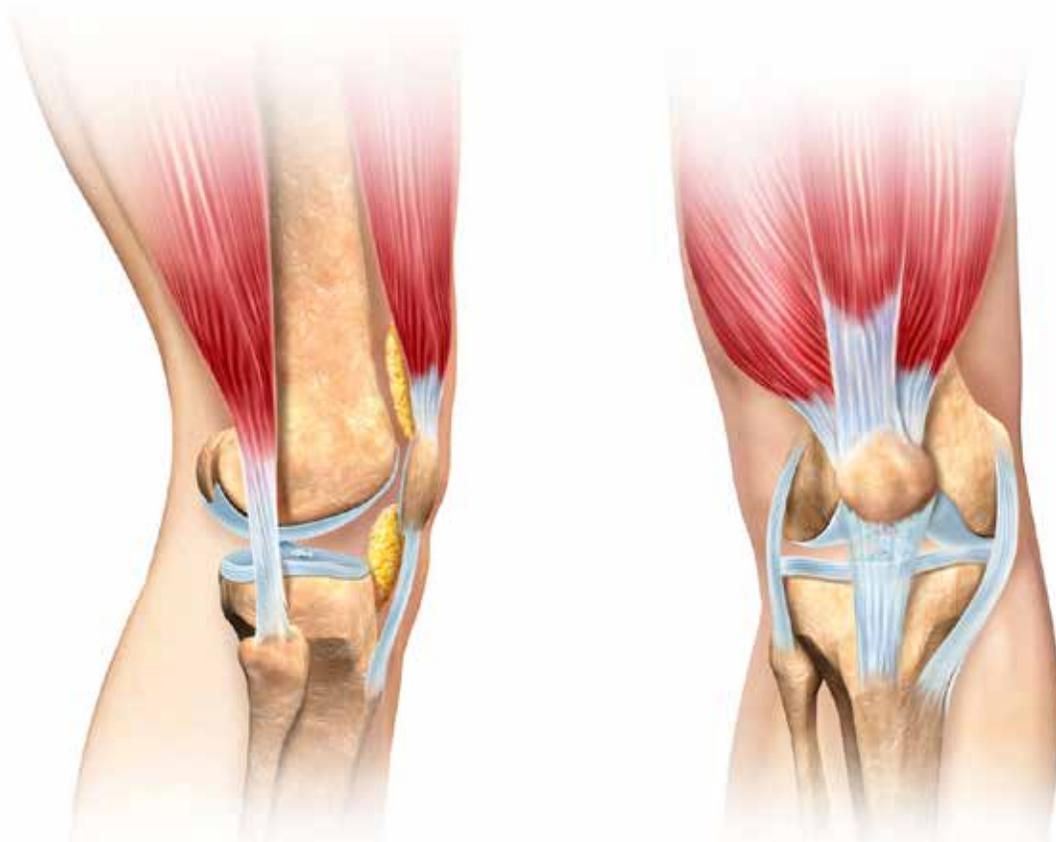
Patellofemoral pain is a common but complex knee problem that occurs in active people. The patella (kneecap) sits in a groove at the bottom of the thigh bone (femur). There are structures (muscles, tendons, ligaments, etc.) surrounding the patella that control how the kneecap moves. While this condition is not completely understood, if the structures surrounding the kneecap are out of proper balance, pain can develop. This pain is located in the front of the knee and is noticed most frequently when a person is going up or down stairs.

Causes

The true source of pain in patellofemoral syndrome is debated. Athletes may feel pain from the bone or muscles surrounding the kneecap. Cartilage is a smooth surface that coats the end of the femur and the back of the patella. If cartilage is worn thin, this condition is given a special name (chondromalacia patella). Cartilage does not have many nerve endings, so the pain is not thought to come from the cartilage itself.

Risk factors

- Repetitive running and jumping activities
- Increase in training (e.g. running more miles)
- Fall on the front of the knee
- Muscle weakness around the knee and higher up
- Patella out of line with the rest of knee joint (“malalignment” of the upper or lower leg)



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Symptoms

Athletes complain of a dull, aching pain in the front of the knee. This pain may become worse when walking up or down stairs, kneeling or squatting, and sitting for long periods of time with the knee bent. Athletes may feel a catching sensation when they bend the knee and may also experience a painful grating or creaking sensation. Unless there is a problem with the cartilage or other internal knee structures, patellofemoral syndrome does not typically cause the knee to swell.

Sports Medicine Evaluation

A sports medicine physician will ask the athlete questions about symptoms and perform a careful physical examination. The physician will ask about the athlete's training program, changes in exercise routine, and prior injuries that might lead to changes in how the athlete runs or jumps. The physician will examine the knee to determine the location of the pain, test strength to identify areas of weakness, and watch and athlete walk or run to evaluate for problems with leg alignment.

Unless the physician is concerned about other knee problems possibly causing the athlete's pain, x-rays are not usually necessary at the beginning of the evaluation. If athletes are not improving over several months of treatment, x-rays may be ordered to evaluate for osteoarthritis (cartilage loss) and knee/leg alignment.



Treatment

For the initial episodes of pain, the athlete may be asked to rest and to avoid any exercises that cause the pain. Non-steroidal anti-inflammatory medications (ibuprofen, naproxen) may be useful as well.

Physical therapy is usually the main form of treatment. The exercises during physical therapy aim to strengthen the muscles around the hip, the front of the thigh (quadriceps), and the back of the thigh (hamstring), in a balanced way that tries to correct any alignment issues that have been identified through a physical exam. If athletes keep doing the exercises they learn, this can benefit them throughout their lives.

In addition, it is helpful to adjust any specific factors encountered in a sport that could be leading to the poor alignment. For example, a bicycle should be adjusted so that the resistance is not too great and the seat is at an appropriate height.

Prevention

Better alignment of the knee is maintained when the muscles in the hip and around the thigh are strong. Since the stress on the knees decreases with every pound that is lost, losing weight can also help to decrease pressure behind the kneecaps. In addition, workouts should be increased gradually; doing this can prevent the onset of patellofemoral syndrome.

Return to Play

Athletes may advance their activity as long as they are pain-free. They may start training at about 50% of previous volume and intensity, then advance by about 10% per week, as tolerated. Rehabilitation should be continued throughout training, particularly quadriceps strengthening. NSAIDs may be useful during this time. Athletes should be warned that playing with discomfort may lead to increased pain and delay full recovery. With any recurrence, a short course of icing, use of NSAIDs, and bracing should be restarted. Athletes should be informed that rehabilitation may take 4 to 6 months before full return to sports is possible.

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References

- Falcone TD, Chimes GP. Patellofemoral syndrome. *Therapeutic Programs for Musculoskeletal Disorders* 2012: 177.
- van der Heijden RA, Lankhorst NE, Linschoten R, et al. Exercise for treating patellofemoral pain syndrome. *The Cochrane Library* 2013.
- LaBotz M. Patellofemoral syndrome; diagnostic pointers and individualized treatment. *Phys Sportsmed*. 2004; 32(7).