What You Need to Know About Patellofemoral Knee Pain

VANDERBILT UNIVERSITY

MEDICAL CENTER

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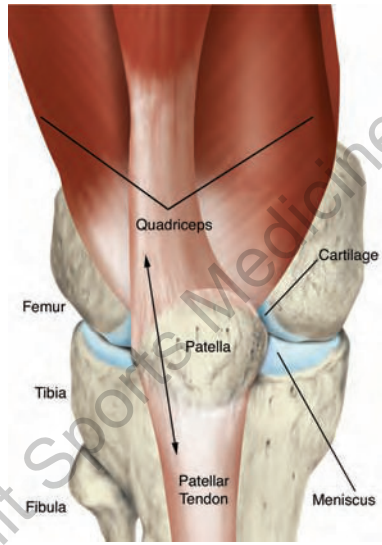
The Kneecap and Knee Joint



The knee joint is made of three bones: the femur (thigh bone), the tibia (shin bone), and the patella (kneecap). The patella is the small triangular bone on the top of the knee. It provides protection for the bones underneath and works by providing leverage to the quadriceps muscles. The kneecap sits in a groove or "track" on the thigh bone. It is lined in the back with cartilage to help it slide easily in this groove. As the leg bends and straightens, the kneecap slides up and down in its track. The kneecap is controlled by the surrounding muscles and ligaments to keep it on track. With an injury, weakness, or muscle tightness, the kneecap may slide off track. This causes increased pressure, wear, and tear to the cartilage behind the patella.

Common Kneecap Problems

Chondromalacia: Chondromalacia patella refers to softening of the articular cartilage behind the kneecap. It may be caused by a traumatic blow to the knee, overuse, muscle weakness, or abnormal alignment. Damage to this cartilage causes uneven pressures under the patella. Instead of sliding smoothly across the thigh bone, it rubs against it. This results in a limited blood supply, and decreases its ability to heal leading to degenerative arthritis.

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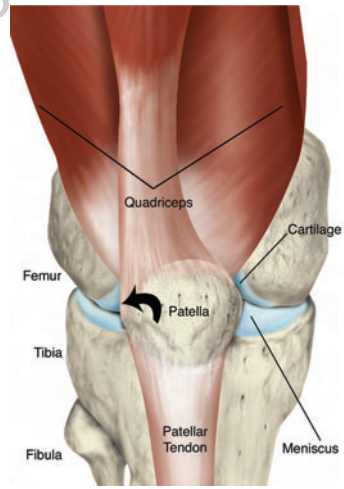
Patellar Tendonitis ("Jumpers Knee"): Patellar tendonitis is a condition resulting from overuse of the knee. It is commonly seen in jumping activities such as basketball and volleyball, as well as in soccer and running. The patellar tendon attaches the quadriceps muscles to the shin bone. Tendonitis occurs when the quadriceps muscles are overused or tight and when the tendon and surrounding tissues become inflamed and irritated. A sudden increase in intensity or frequency of training, poor body mechanics, or repeated activity on a rigid surface may trigger tendonitis. Symptoms are pain in the area of the tendon, a feeling of tightness in the knee, and pain early in an exercise or following activity.

Plica Band Syndrome: Plica bands are tissue fibers that are near the kneecap. The plica is a normal tissue that is a divider between upper and lower portions of the knee. Sometimes they become irritated or inflamed through accidents or mild stresses. Plica may then pinch, snap, or catch on the end of the thigh bone causing aching in the area of the patella.

Patella Dislocation: Anterior knee pain may result when the kneecap partly comes out of the groove (subluxation), or completely comes out of the groove of the femur (dislocation). The kneecap can be unstable if it tracks unevenly in this groove. It may also have this tendency due to an abnormally shaped patella or abnormally low walls (sides) in the groove. Weak muscles on the inner side of the knee and tight structures on the outside can cause the kneecap to be pulled out of place.



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What is Patellofemoral Pain?

Many people walk around everyday with knee pain and don't know exactly what is wrong with them. This pain can affect everyday activities including work. Many of these people are suffering from a fairly common knee problem called patellofemoral pain syndrome, or anterior knee pain. Typically, patellofemoral pain occurs in one knee but is sometimes present in both knees. With this syndrome, you may have pain under or around your kneecap and in the front of the knee. Everyone's pain is different but generally there is a sensation of tightness, aching, and throbbing in your knee. You may also experience pain with functional activities such as discomfort with prolonged sitting with the knee bent, squatting down, walking, and running. There are many different causes of patellofemoral problems, including overuse of the knee, malalignment in the lower extremity, muscle strength imbalances, and lack of flexibility. Treatment of these conditions is usually successful in decreasing patellofemoral pain. This will be discussed in more detail later in the brochure.

What you can do to feel better

Before contacting your physician, you may want to reduce the pain and swelling you are feeling. This will begin the healing process.

At home you can:

- Keep your knee elevated above the level of your heart to help prevent the swelling in your knee and take appropriate over the counter anti-inflammatory medicine in normal dosages to help you rest and sleep better.
- Place some form of cold such as ice or a bag of frozen vegetables on your knee throughout the day for 15- 20 minutes every 3 hours you are awake.

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- You may also feel better if you cut back on activities that often result in knee pain. These include, but are not limited to:

    1. excessive use of stairs
    2. squatting
    3. kneeling or sitting for long periods of time
    4. prolonged walking on hard surfaces

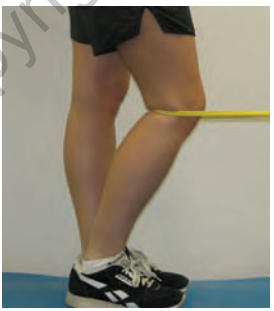
Individuals who are normally committed to a physical lifestyle but are now bothered by knee pain can modify their activities by following the concept of "relative rest". Stay active but avoid over-doing it. Simply stated, if your knee hurts while you are engaged in an activity, you should stop and reduce the stress on your body.

Examples of Home Exercises:

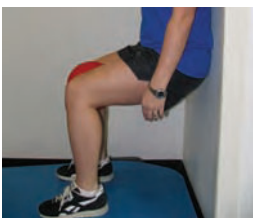
Hip Abduction

Hip Adduction

Quadriceps Stretch



Terminal Knee Extension



Wall Sits

Hamstring Stretch

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What to Expect from a Medical Examination

Your physician will conduct a thorough examination of your knee to determine the exact cause and extent of the problem. If he determines that the joint or associated bone structures are damaged, he may refer you to an orthopaedic physician who specializes in such injuries. The examining physician will take a medical history and ask you to explain and demonstrate exactly where and under what conditions your knee is painful. He or she will then conduct a complete examination of your knee and all supporting structures. He or she may also suggest other specialized tests such as x-ray and/or MRI to determine exactly what the inside of your knee looks like.

The most common outcome of such a process is non surgical therapy and involves working with a licensed physical therapist and a team of certified athletic trainers in bi-weekly sessions in the clinic. The therapist will further evaluate your rehabilitation needs, design a home exercise program and oversee your physical therapy with the rehabilitation team to maximize your safe return to normal activities of daily living. The home exercise program is the foundation of your rehabilitation. Your daily exercises at home will enable your rehabilitation team to build upon that base in the clinic to increase your flexibility and overall strength.

There are 3 phases of rehabilitation with specific goals:

1. **Reduce pain and swelling:** The rehabilitation team may use both passive and active forms of safe motion of your knee to help you return to normal function. Modalities such as heat and ice may be used on some patients.
2. **Strengthen leg and supporting muscles of the knee:** The rehabilitation team will instruct you in the safe and conservative use of weights and exercise equipment to help you regain strength and function in your knee. Emphasis will also be placed on increasing flexibiltiy of lower extremity muscles. You will be given a home exercise program with written instructions that can be done with minimal equipment.
3. **Return to activities of daily living:** The rehabilitation team will help you with regain normal movements and pain-free activities to meet your particular lifestyle needs

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What to Expect After Rehabilitation

After you have successfully eliminated most of your pain and have returned to your normal function, it is important for you to continue to be involved in some form of orthopaedic fitness to insure continued good physical health and activity levels. You should consider a lifestyle of organized physical activity. Your rehabilitation team can advise you on this step.

Outcomes

Results vary for every individual depending upon the activity level and the severity of the injury. Most patients recover with relative rest, strengthening and stretching. Though arthritis and other complications may hinder your final outcome, you will get the best results by complying with your home exercise program and maintaining strength and flexibility after completion of your rehabilitation.

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