

# Patellofemoral Arthritis

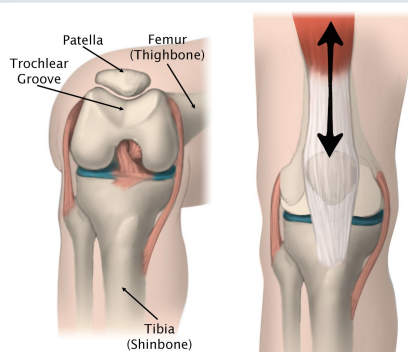
Patellofemoral arthritis affects the underside of the patella (kneecap) and the channel-like groove in the femur (thighbone) that the patella rests in. It causes pain in the front of your knee and can make it difficult to kneel, squat, and climb and descend stairs

## Anatomy

The patella is a small bone located in front of your knee joint — where the thighbone (femur) and shinbone (tibia) meet. It protects your knee and connects the muscles in the front of your thigh to your tibia.

The patella rests in a groove on top of the femur called the trochlear groove. When you bend and straighten your knee, the patella moves back and forth inside this groove.

A slippery substance called articular cartilage covers the ends of the femur, trochlear groove, and the underside of the patella. Articular cartilage helps your bones glide smoothly against each other as you move your leg.



**(Left)** The patella rests in a small groove at the end of the femur called the trochlear groove. **(Right)** As you bend and straighten your knee, the patella slides up and down within the groove.

*Reproduced and adapted from The Body Almanac. American Academy of Orthopaedic Surgeons, 2003.*

## Description

Patellofemoral arthritis occurs when the articular cartilage along the trochlear groove and on the underside of the patella wears down and becomes inflamed. When cartilage wears away, it becomes frayed and, when the wear is severe, the underlying bone may become exposed. Moving the bones along this rough surface may be painful.

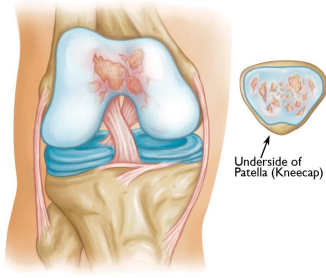
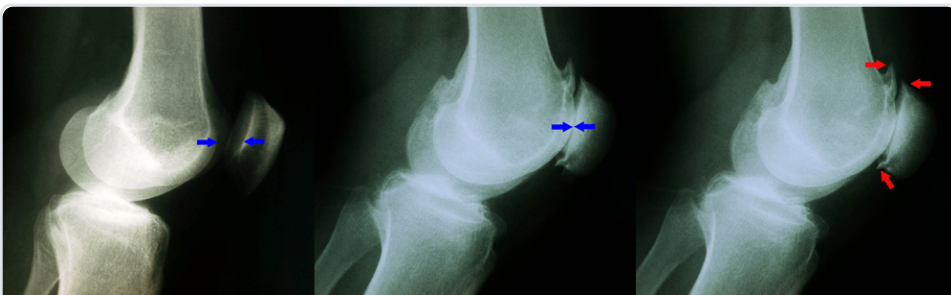


Illustration shows patellofemoral arthritis. The patella (kneecap) has been removed to show damage to the cartilage on the underside.

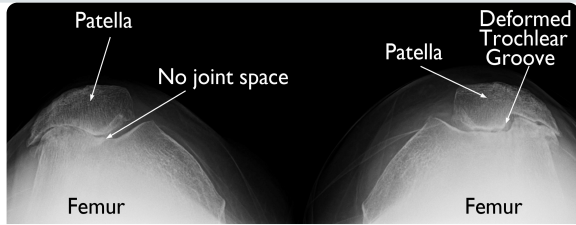


**(Left)** This x-ray shows a normal knee from the side. The arrows point to the normal amount of space between the bones. **(Middle)** In this x-ray, the arrows point to narrowed joint space due to patellofemoral arthritis. **(Right)** Here, the arrows point to bone spurs that have developed due to the arthritis.

## Cause

### ***Dysplasia***

Dysplasia occurs when the patella does not fit properly in the trochlear groove of the femur. Because of this, when the knee moves, there are increased stresses on the cartilage. This begins to wear the cartilage down.



X-ray taken from above the knee shows dysplasia that has developed into severe arthritis. There is no joint space remaining in the knee on the left. On the right, the trochlear groove has become deformed.

*Courtesy of Ronald P. Grelsamer, MD*

## ***Kneecap Fracture***

Patellar (kneecap) fractures often damage the articular cartilage that covers and protects the underside of the bone. Even though the broken bone heals, the joint surface may no longer be smooth. There is friction when the patella moves against the joint surface of the femur. Over time, this can lead to arthritis.

## **Symptoms**

The main symptom of patellofemoral arthritis is pain. Because the patellofemoral joint is in front of the knee, you may have pain in this area. The pain can be present at rest or with no activity at all. Most of the time, however, it is brought on by activities that put pressure on the kneecap, such as kneeling, squatting, climbing and descending stairs, and getting up from a low chair.

In addition, you may experience a crackling sensation called crepitus when you move your knee. Crepitus is sometimes painful and can be loud enough for other people to hear. When the disease is advanced, your kneecap may get stuck or "catch" when you straighten your knee.

## **Treatment**

### ***Nonsurgical Treatment***

Treatment of patellofemoral arthritis is similar to the treatment of knee arthritis in general. Most cases can be treated without surgery. Nonsurgical options include:

**Nonsteroidal anti-inflammatory drugs (NSAIDs).** Drugs like aspirin, naproxen, and ibuprofen reduce both pain and swelling.

**Exercise.** Regular exercise can decrease stiffness and strengthen the muscles that support your knee.

Patients who have patellofemoral arthritis should try to avoid activities that put stress on the front of the knee, such as squatting. If you regularly do high-impact exercise, switching to low-impact activities will put less stress on your knee. Walking and swimming are good low-impact options.

**Activity modification.** In many cases, avoiding activities that bring on symptoms – such as climbing stairs – will help relieve pain.

**Weight loss.** If you are overweight, losing just a few pounds can make a big difference in the amount of stress you place on your knee. Losing weight can also make it easier to move and maintain independence.

**Physical therapy.** Specific exercises can improve range-of-motion in your knee. Exercises to strengthen the quadriceps muscles will help relieve pressure on the kneecap when you straighten your leg. If an exercise causes pain, stop the exercise and talk to your doctor or physical therapist.

**Cortisone (steroid) injections.** Cortisone is a powerful anti-inflammatory medicine that can be injected directly into your knee.

**Viscosupplementation.** In this procedure, a substance is injected into the joint to improve the quality of the joint fluid. The effectiveness of viscosupplementation in treating arthritis is unclear and continues to be studied by researchers.

## ***Surgical Treatment***

Surgery is an option when nonsurgical treatment has failed. Several types of surgical procedures are available.

**Chondroplasty.** This procedure is done with arthroscopy – inserting thin surgical instruments into small incisions around your knee. During a chondroplasty, your surgeon trims and smooths roughened arthritic joint surfaces. Chondroplasty is an option in cases of mild to moderate cartilage wear.

**Realignment.** The soft tissues on either side of the kneecap are tightened or released to change the position of the kneecap in the trochlear groove.

**Cartilage grafting.** Normal healthy cartilage tissue may be taken from another part of the knee or from a tissue bank to fill a hole in the articular cartilage. This procedure is typically considered only for younger patients who have small areas of cartilage damage.

**Tibial tuberosity transfer.** This procedure can help relieve pain in patients with arthritis in specific portions of the patella. The patellar tendon below the kneecap attaches to a bump on the front of the knee called the tibial tuberosity. Shifting the bump in any direction will change the position of the kneecap. After the procedure, the patella should move more smoothly in the trochlear groove, reducing pressure on the arthritic areas and relieving pain.

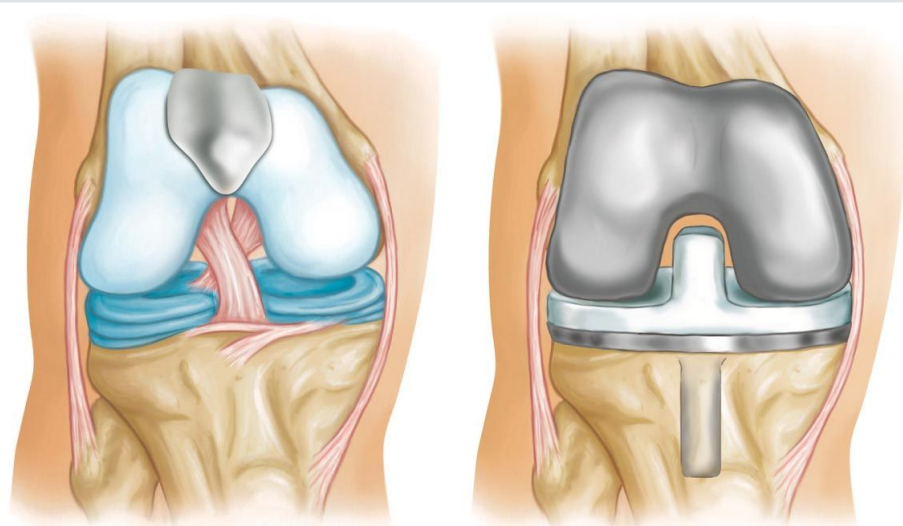
**Patellofemoral replacement.** During this "partial" knee replacement, damaged bone and cartilage surfaces are removed and replaced with metal and polyethylene (plastic) components. A thin metal shield is used to resurface the trochlear groove at the end of the femur. A plastic “button” or cover is used to resurface the backside of the patella. These components are typically held to the bone with cement.



(**Left**) X-ray taken from above the knee. The patella and the trochlear groove of the femur have become deformed due to arthritis. There is bone rubbing on bone. (**Right**) The same knee after patellofemoral replacement. The patellar implant on the underside of the kneecap does not show in an x-ray.

Patellofemoral replacement surgery cannot be carried out if there is arthritis involving other parts of the knee. If this is the case, your doctor may recommend a total knee replacement.

**Total knee replacement.** In a total knee replacement, all the cartilage surfaces of the knee are resurfaced. The end of the femur and the top of the tibia are capped with a metal prosthesis. A plastic spacer is placed in between these components to create a smooth gliding surface. Additionally, the patella itself is usually resurfaced with a plastic “button.”



Patellofemoral

Total

**(Left)** Patellofemoral replacement. This “partial” knee replacement can be used to treat arthritis that is limited to the underside of the patella and the trochlear groove. If other parts of the knee are involved, a total knee replacement **(Right)** may be recommended.

## Outcomes

For most patients, treatment for patellofemoral arthritis is successful in relieving pain and improving function. Outcomes vary, however, depending on patient-specific factors and the type of treatment. Your doctor will talk with you about the expected outcome of treatment in your specific situation.

### Last Reviewed

January 2018

### Contributed and/or Updated by

[Jared R.H. Foran, MD](http://www7.aaos.org/education/disclosure/getsummary/000000336655/04-16-2017)(<http://www7.aaos.org/education/disclosure/getsummary/000000336655/04-16-2017>)

[Ronald P. Grelsamer, MD](http://www7.aaos.org/education/disclosure/getsummary/000000014909/06-23-2010)(<http://www7.aaos.org/education/disclosure/getsummary/000000014909/06-23-2010>)

### Peer-Reviewed by

[Stuart J. Fischer, MD](http://www7.aaos.org/education/disclosure/getsummary/000000017539/01-17-2018)(<http://www7.aaos.org/education/disclosure/getsummary/000000017539/01-17-2018>)

AAOS does not endorse any treatments, procedures, products, or physicians referenced herein. This information is provided as an educational service and is not intended to serve as medical advice. Anyone seeking specific orthopaedic advice or assistance should consult his or her orthopaedic surgeon, or locate one in your area through the AAOS [Find an Orthopaedist](http://www7.aaos.org/member/directory/search.aspx?directory=public)(<http://www7.aaos.org/member/directory/search.aspx?directory=public>) program on this website.