

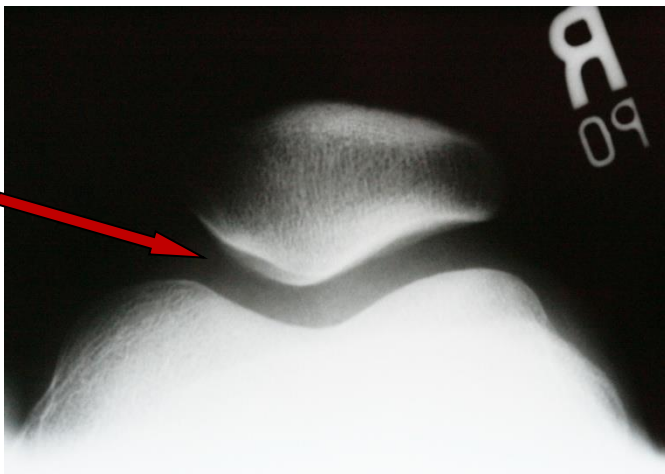
**STEVEN CHUDIK MD**  

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**SHOULDER, KNEE & SPORTS MEDICINE**

## Patellofemoral Osteoarthritis

Arthritis of the patellofemoral joint refers to degeneration (wearing out) of the cartilage on the underside of the patella (kneecap) and the trochlea (groove) of the femur. This condition can cause anterior knee pain and limitations in stair climbing and getting up from a chair. The patella (kneecap) is a bone within the tendon of the quadriceps muscle that sits in a groove (trochlea) of the thigh bone. The protective layer of cartilage on the surface of the patella and trochlea allows the smooth, painless movement of the patella along the groove. Injury upon degeneration of the cartilage leads to arthritis, resulting in symptoms of pain, stiffness, and swelling of the knee.



X-ray of the patella demonstrating apparent normal joint space (indicating healthy cartilage)



X-ray of the patella with degenerative changes and loss of joint space

### Frequent Signs and Symptoms

- Knee pain, usually in the front of the knee or behind the kneecap
- Pain that worsens with sitting for long periods, arising from a sitting position, going up or down stairs or hills, kneeling, squatting, or wearing shoes with heels
- Pain with jumping
- Usually achy pain but may be sharp
- Giving way, catching of the knee
- Often associated with swelling after activity



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### Etiology (Causes)

This condition commonly occurs in the aging population, although it may occur in younger patients following trauma such as a dislocation of the patella or patella fracture. Mechanical abnormalities or poor patella tracking can occur in individuals with extreme leg mal-alignment. Injury to the cartilage surfaces from patella fractures, patella dislocation, other trauma, or overuse can accelerate the wearing out (degeneration) of the patellofemoral cartilage and lead to symptomatic patellofemoral arthritis. Surgery on the knee to “realign” the patella position can lead to abnormal mechanical forces and contribute to arthritis as well.

### Risk Factors

- Age, obesity, chronic instability, high riding patella or poor patella tracking
- Overuse in sports that involve running, jumping, or squatting
- Poor alignment of the legs (knock knees, kneecaps that point toward each other when the feet are straight ahead), poorly formed trochlea (something you are born with), flat feet
- Previous injury or surgery to the knee including patella fracture, dislocation, or cartilage injury

### Prevention

- Avoid activities with high shear stress or compressive force to kneecap
- Maintain appropriate conditioning:
  - Thigh, knee, and calf flexibility
  - Muscle strength and endurance
- Weight loss and proper diet
- Surgical options are available for patients with inherently poor patella position/alignment

### Outcomes

Patellofemoral arthritis is a progressive condition that continues to worsen over time. Most conservative treatments are aimed at slowing the degenerative process and limiting symptoms. Conservative treatment, including physical therapy and activity modification, has been shown to offer relief for a considerable amount of time, allowing patients to return to most normal activities.

### Potential Complications

- Frequent recurrence of symptoms and disability severe enough to diminish normal activity
- Rapid progression of pain and symptoms
- Weight gain and deteriorated health due to loss of knee function and mobility
- Increased swelling
- Impaired sense of balance and loss of strength may lead to falls or other injuries



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### Treatment Considerations

Conservative treatment of the knee includes activity modification, physical therapy, medications, and injections. While it is important to use and move an arthritic knee, patients are cautioned to avoid overuse. Keeping the activity level below the threshold of pain and aggravation will help to improve the symptoms and prolong the ability to use the knee. This process is often aided by attending formal physical therapy to learn how to maintain range of motion, strength and function. Some patients require a cane or walker to help them ambulate as the arthritis becomes more severe.

**Activity modification** typically involves a decrease in time spent doing activities that stress the patellofemoral joint like jumping, running, lunges, stairs, etc. Dr. Chudik recommends biking, swimming, and water exercises as excellent choices for cardiovascular and strength exercise.

**Weight loss** helps reduce arthritic knee symptoms in the majority of patients as this leads to a reduction in the weightbearing forces across the knee joint.

**Medications** can provide safe, long-term pain relief if taken appropriately. Tylenol® (up to 4g per day), or over-the-counter NSAIDs (Aleve®, ibuprofen, Motrin®, etc.) can be very effective for managing arthritic pain symptoms.

**Injections** are another popular option for conservative management of arthritis. Many patients experience significant relief from a corticosteroid injection. These injections deliver anti-inflammatory medications directly into the knee joint space.

Once these choices have failed to provide pain relief, the patient may need to consider surgical options. Although it is considered a last resort, surgery is a viable option for patients that face constant pain and functional limitations with the knee. Surgical options of arthroscopy, patellofemoral realignment surgery, isolated patellofemoral arthroplasty (replacement), and total knee arthroplasty may be indicated for severe symptoms.

### Modalities (Heat and Cold)

- Cold is used to relieve pain and reduce inflammation. Cold should be applied for 10 to 15 minutes every two to three hours for inflammation and pain and immediately after any activity that aggravates your symptoms. Use ice packs or an ice massage with a cloth between the ice and your skin to prevent burning/freezing your skin.
- Use heat before performing stretching and strengthening activities prescribed by your physician or physical therapist. Use a heat pack or a warm soak.



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### Arthroscopy

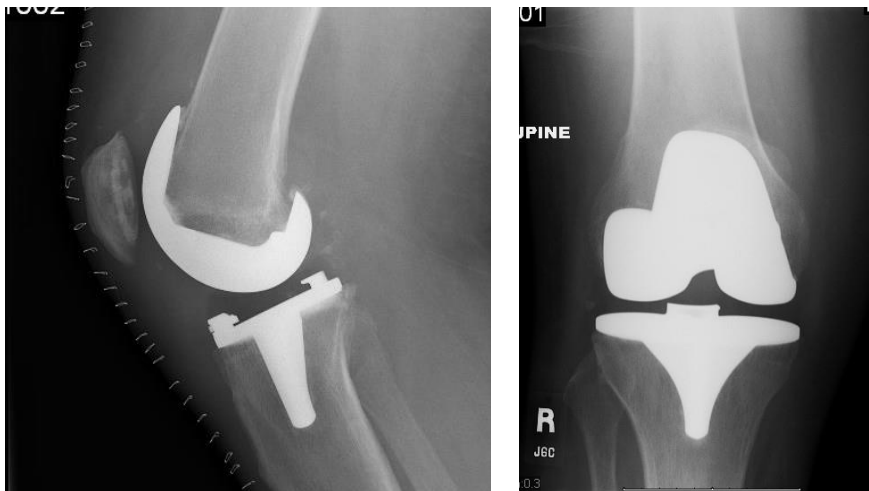
Arthroscopy can debride (clean-up) loose ends of torn cartilage and treat focal (small and limited) breaks in the cartilage surface. Outcomes for treating widespread cartilage damage (arthritis) with arthroscopic debridement are less predictable.



Arthroscopic surgical photo. The frayed edges of worn cartilage and the exposed bone surface can be seen in this photo.

### Total Knee Arthroplasty (TKA)

Total knee replacement serves to replace all of the damaged and arthritic joint surfaces with special metal and plastic, maintaining the remaining bone, tendon, and ligaments. It has very successful outcomes regarding pain relief and achieving functional motion.



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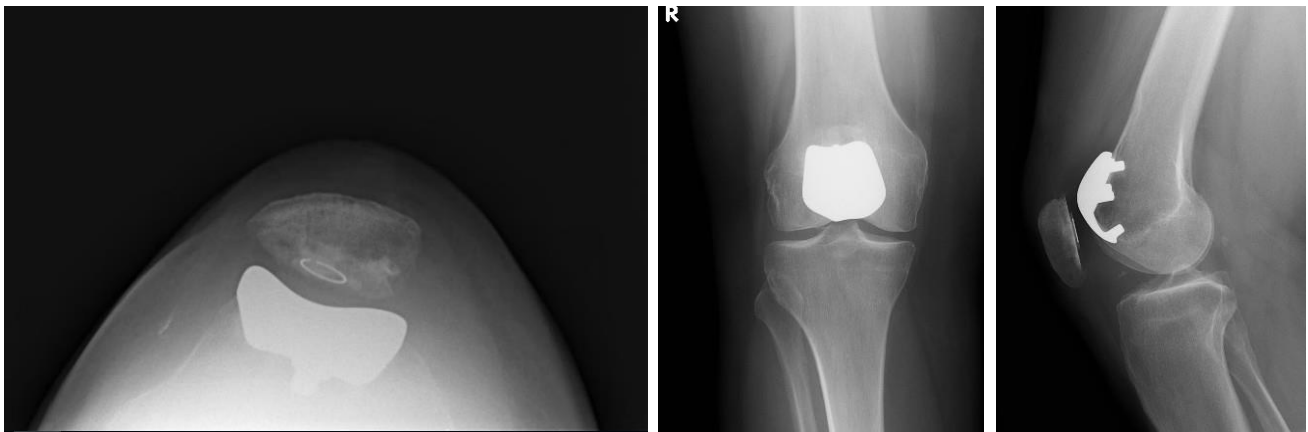
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### Unicompartmental replacement (Patellofemoral Arthroplasty)

Unicompartmental (Single compartment) knee replacement can be performed to resurface damaged and arthritic joint surfaces in any of the three different compartments of the knee. A less invasive procedure can resurface a single compartment of the knee if the others are still in good condition. The advantage is less surgery but the disadvantage is that unicompartment knee replacement may need revision surgery to a total knee surgery. Recent data shows results and outcomes for unicompartment replacement are approaching that for total knee arthroplasty. Robotic and computer navigation are improving the technical ability to accurately position of the unicompartment implants and theoretically improving the survivorship



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## Simple Knee Stretches and Exercises

### Quadriceps Sets



1. Sit or lie on your back with the affected leg straight.
2. Tighten the muscles on the front of your thigh and push your knee down into the table.
3. Hold this position for five seconds then relax. Repeat exercise 10-15 times, two to three times a day.

### Quadriceps Short Arc Sets



1. Sit or lie on your back with the affected leg straight.
2. Place a rolled up towel or pillow under your knee allowing it to bend.
3. Tighten the muscles on the front of your thigh and lift your heel off the table.
4. Hold this position for three to five seconds then repeat 10-15 times, two to three times per day.



### Isometric Hamstrings (Heel Digs)



1. Lie on your back and bend your knee to where you feel a stretch.
2. Contract your hamstrings (back of thigh) muscles, attempting to bend the knee while forcefully dig your heel into the floor or bed.
3. Hold this position for three to four seconds then relax.
4. Repeat this exercise 10-15 times, two to three times a day.

### Standing Calf Raises



1. While standing with the ball of your foot on the flat of a low stair, slowly raise both heels.
2. Hold this position for two to three seconds then return to the starting position.
3. Repeat this exercise 10-15 times, two to three times per day.
4. **Hold on to a railing for support and balance as necessary. If you are concerned about balance, you can perform these exercises on the floor while you sit in a chair or stand with your hands on a nearby wall.**
5. **Perform this exercise in your brace if provided**



### Straight Leg Lifts



1. Lie on your back while keeping the affected leg straight.
2. Tighten the muscles on top of your thigh then raise the leg 12-18 inches off the floor.
3. Hold for three to five seconds then lower the leg to the starting position.
4. Repeat this exercise 10-15 times, two to three times per day.
5. **Perform this exercise in your brace if provided**

### Straight Leg Abduction (Side) Lifts



1. Lie on your side with the affected leg on top.
2. While keeping the leg straight slowly raise it 12-18 inches.
3. Hold this position for three to five seconds then lower the leg to the starting position.
4. Repeat this exercise 10-15 times, two to three times per day.
5. **Perform this exercise in your brace if provided**

### **Straight Leg Extension Lifts**



1. Lie on your stomach as shown.
2. While keeping the affected leg straight raise it 12-18 inches
3. Hold this position for three to five seconds then lower the leg to the starting position.
4. Repeat this exercise 10-15 times, two to three times per day.
5. **Perform this exercise in your brace if provided**

### **Hip Adduction (Ball Squeezes)**



1. While sitting or lying on your back, place a medium sized ball or large pillow between your legs.
2. Squeeze the ball.
3. Hold this position for three to five seconds then relax.
4. Repeat this exercise 10-15 times, two to three times per day.

### **Acknowledgements**

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