



## Runner's Knee (Patellofemoral Pain)

Runners, jumpers, and other athletes such as skiers, cyclists, and soccer players put heavy stress on their knees. Runner's knee is a term used to refer to a number of medical conditions that cause pain around the front of the knee (patellofemoral pain). These conditions include anterior knee pain syndrome, patellofemoral malalignment, and chondromalacia patella.

### Causes

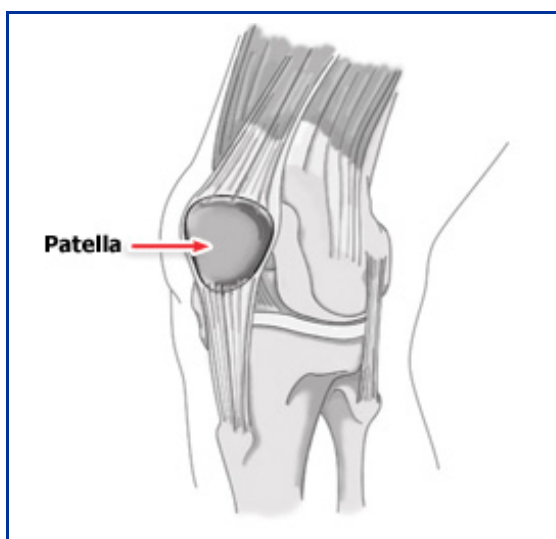
The knee is a complex structure and is very sensitive. A number of factors can contribute to runner's knee, including:

- Malalignment of the kneecap
- Complete or partial dislocation
- Injury
- Tightness, imbalance, or weakness of thigh muscles
- Flat feet

Patellofemoral pain may be the result of irritation of the soft tissues around the front of the knee. Strained tendons are fairly common in athletes. Other contributing factors to patellofemoral pain include overuse, muscle imbalance and inadequate stretching. Pain that begins in another part of the body, such as the back or hip, may cause pain in the knee (referred pain).

In some people with runner's knee, the kneecap is out of alignment. If so, vigorous activities can cause excessive stress and wear on the cartilage of the kneecap. This can lead to softening and breakdown of the cartilage on the patella (chondromalacia patella) and cause pain in the underlying bone and irritation of the joint lining.

### Symptoms



A dull, aching pain under or around the front of the kneecap (patella) where it connects with the lower end of the thighbone (femur). Pain occurs when walking up or down stairs, kneeling, squatting, and sitting with a bent knee for a long period of time.

## Prevention

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- **Stay in shape.** Good general conditioning is important to controlling and preventing patellofemoral pain. If you're too heavy, you may need to lose weight to avoid overstressing your knees.
- **Stretch.** Before running or any other exercise, first do a 5-minute warm up, followed by stretching exercises. Stretching, particularly in the face down position (prone), will help keep the supporting structures around the front of the knee flexible and less likely to be irritated with exercise. For example, when lying prone, grab the ankle of the affected leg with one hand, and gently stretch the front of the knee. Stretch before and after exercise.
- **Increase training gradually.** Avoid sudden changes in the intensity of exercise. Increase force or duration of activities gradually.
- **Use proper running gear.** Use running shoes with good shock absorption and quality construction. Be sure that shoes fit properly and are in good condition. If you have flat feet, you may need shoe inserts.
- **Use proper running form.** Lean forward and keep your knees bent. Also, try to run on a clear, smooth, resilient, even, and reasonably soft surface. Never run straight down a steep hill. Walk down it, or run in a zigzag pattern.

## Diagnosis

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### *Medical History*

Your doctor will take a complete medical history and inquire about your symptoms. Tell your doctor about any sports participation or training you are involved in, and which activities aggravate your knee pain. Have there been any recent changes to the duration, frequency, or intensity of your activities? Any changes to the surfaces you run or play upon?

### *Physical Examination*

Your doctor will perform a physical examination on your knee to help determine the cause of pain.

To assess your knee's strength, mobility and alignment, the doctor may ask you to stand, walk, jump, squat, sit, and lie down.

The physical examination will include a check of the alignment of your lower leg, kneecap, and quadriceps; knee stability, hip rotation, and range of motion of knees and hips; under the kneecap for signs of tenderness; the attachment of thigh muscles to the kneecap; strength, flexibility, firmness, tone, and circumference of quadriceps and hamstring muscles; tightness of the heel cord and flexibility of the feet.

### *Imaging*

The doctor may order diagnostic imaging studies, such as X-rays, magnetic resonance imaging (MRI) and computed tomography (CT) scans, and blood tests to rule out damage to the structure of the knee and the tissues that connect to it.

## Treatment

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Treatment depends upon the particular problem causing the knee pain, and is usually nonsurgical.

### *First Aid*

Stop doing any activity that causes knee pain. This probably means stopping any running or jumping.

Use the RICE formula:

- **Rest.** Avoid putting weight on the painful knee. Some athletes temporarily switch to a non-weight-bearing activity, such as swimming.
- **Ice.** Apply cold packs or ice wrapped in a towel for short periods of time, several times a day.
- **Compression.** Use an elastic bandage such as a simple knee sleeve with the kneecap cut out that fits snugly without causing pain.
- **Elevation.** Keep the knee raised up higher than your heart.

Take nonsteroidal anti-inflammatory medications such as aspirin or ibuprofen if you need more pain relief. If your knee does not improve with rest, see your doctor for a complete medical evaluation and diagnosis. Runner's knee usually gets better with early treatment and reconditioning.

### **Nonsurgical Treatment**

After resting the knee until the pain and swelling go down, you may need reconditioning to regain full range of motion, strength, power, endurance, speed, agility, and coordination. Your doctor may prescribe an exercise program to normalize the flexibility and strength of thigh muscles, or recommend cross-training exercises that emphasize stretching the lower extremities. Your doctor will tell you when you may gradually resume running and other athletic activities.

Other nonsurgical treatments involve taping the kneecap or using a special brace for knee support during sports participation. Special shoe inserts (orthotics) may sometimes be prescribed and may help relieve the pain.

### **Surgical Treatment**

When needed, surgical treatments include:

- Arthroscopy. The surgeon removes fragments of damaged kneecap cartilage through a small incision, using a pencil-sized instrument called an arthroscope.
- Realignment: The surgeon opens the knee structure and realigns the kneecap, reducing the abnormal pressure on cartilage and supporting structures around the front of the knee.

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## **Related Articles**

Athletic Shoes (<http://orthoinfo.aaos.org/topic.cfm?topic=A00318>)

Knee Arthroscopy (<http://orthoinfo.aaos.org/topic.cfm?topic=A00299>)

Safe Exercise (<http://orthoinfo.aaos.org/topic.cfm?topic=A00418>)

## **Related Resources**

Wellness: Knee Exercise Conditioning Program (/PDFs/Rehab\_Knee\_6.pdf)

### **OrthoInfo**

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