

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 some people use to refer to a number of medical conditions that can cause pain around the front of the knee (patellofemoral pain). These conditions include anterior knee pain syndrome, patellofemoral malalignment and chondromalacia patella.

Symptoms

Dull, aching pain under or around the front (anterior) of the kneecap-where the kneecap (patella) connects with the lower end of the thighbone (femur). It hurts to:

- Go up or down stairs
- Kneel
- Squat
- Sit with the knee bent for long periods of time

Cause

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

- The kneecap being out of alignment relative to the rest of the knee
- Injury
- Excessive training or overuse
- Tightness, imbalance or weakness of thigh muscles
- Having flat feet

First aid

Stop doing any activities that hurt the knee, and don't start again until you can do them without any pain. This probably means stopping any running or jumping sports. Use the R.I.C.E. 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 complete medical evaluation and diagnosis. "Runner's knee" usually gets better with early treatment and reconditioning.

Medical evaluation

Tell your doctor your complete medical history. He or she will physically examine your knee and may order X-rays or other diagnostic tests to help determine the cause of pain.

- **Medical history.** Describe your symptoms. When did knee pain start? Tell the doctor about any sports participation or training you are involved in, and which activities aggravate your knee. 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 exam.** To assess your knee's strength, mobility and alignment, the doctor may ask you to stand, walk or jump, squat, sit and lie down. He or she may check alignment of the 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.
- **Diagnostic tests.** In some cases, the doctor may need to rule out damage to the structure of the knee and the tissues that connect to it. He or she may order diagnostic tests such as X-rays, MRIs (magnetic resonance imaging studies), CT (computed tomography) scans and blood tests.

Diagnosis

Patellofemoral pain may be the result of irritation in the soft tissues around the front of the knee. Strained tendons are fairly common in athletes. 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 cases, the kneecap may be

out of alignment. If so, vigorous activities can cause excessive stress and wear on the cartilage of the kneecap. This can lead to the cartilage softening and breaking down (chondromalacia of the patella), and cause pain in the underlying bone and irritation of the joint lining.

Treatment and reconditioning

Treatment depends upon the particular problem causing knee pain, and is usually non-surgical. After resting the knee until 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 sports activities.

Other non-surgical 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 help the pain go away.

When needed, surgical treatments include:

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

Prevention

To avoid knee pain:

- **Stay in shape.** Good general conditioning is important to controlling or preventing patellofemoral pain. If you're too heavy, you may need to lose weight to avoid overstressing your knees. Before running or any other exercise, first do a five-minute warm up, followed by stretching exercises.
- **Stretch.** Stretching, particularly in the face down position (prone), will help keep flexible the supporting structures around the front of the knee, and make them 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 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 the 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.

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