

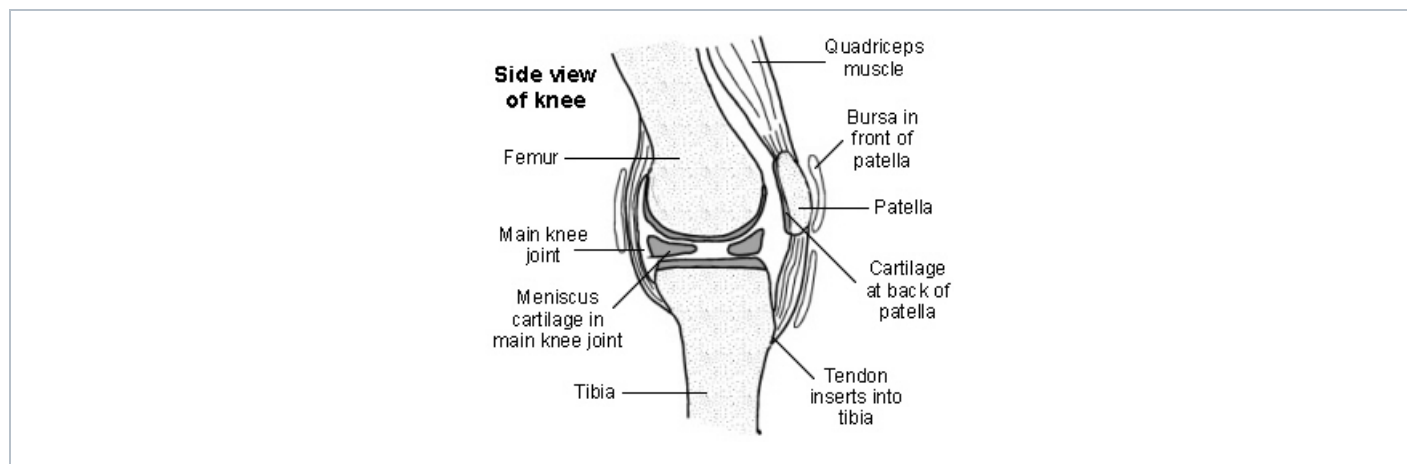
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Knee Pain (Patellofemoral Pain)

Patellofemoral pain is the name for a common cause of pain around the front of the knee. It is also called patellofemoral pain syndrome, patellofemoral syndrome or anterior knee pain.

What is patellofemoral pain?

Patellofemoral pain is the medical term used when pain occurs at the front of the knee, around the kneecap (patella), without signs of any damage or other problems in the knee joint.



The patella is the kneecap bone. It lies within the quadriceps tendon. This large tendon from the powerful thigh muscles (quadriceps) wraps round the patella and is attached to the top of the lower leg bone (tibia). The quadriceps muscles straighten the knee.

The back of the patella is covered with smooth cartilage. This helps the patella to glide smoothly over the lower part of the thigh bone (femur) when you straighten your leg.

What are the symptoms of patellofemoral pain?

- Pain around the knee. The pain is felt at the front of the knee, around or behind the kneecap (patella). Often, the exact site of the pain cannot be pinpointed; instead the pain is felt vaguely at the front of the knee.
- The pain comes and goes.
- Both knees are often affected at the same time but one is usually worse than the other.
- The pain is typically worse when going up or, in particular, going down stairs.
- Running, especially downhill, squatting and certain sports can all set it off - anything that leads to the patella being compressed against the lower part of the thigh bone.
- The pain may be brought on by sitting still for long periods. For example, after going to the cinema or for a long drive, when it will be worse when starting to move about again.
- There may be a grating or grinding feeling or a noise when the knee bends and straightens. This is called crepitus.
- Sometimes there is puffiness or swelling around the kneecap.

How is patellofemoral pain diagnosed?

The diagnosis is made from your symptoms, the history of the problem, plus an examination of your knee.

Tests, such as X-rays or scans, cannot diagnose patellofemoral pain and are not helpful. However, sometimes they might need to be done to look for other conditions. This might be the case if your symptoms aren't the usual ones. Or they might be needed if you have injured your knee. It is very rare to have any other kind of tests for patellofemoral pain.

What causes patellofemoral pain?

It is probably due to a combination of different factors which increase the pressure between the kneecap (patella) and the lower part of the thigh bone (femur). This may happen during running, cycling, squatting and going up and down stairs. It is likely that the cause is not the same in everyone affected.

Situations where this can occur include:

- Overuse of the knee, such as in certain sports - particularly at times of increased training.
- Cycling when the saddle is too low or too far forward.
- Some people may have a slight problem in the alignment of the patella where it moves over the lower femur. This may cause the patella to rub on, rather than glide over, the lower femur. It may be due to the way the knee has developed. Or, it may be due to an imbalance in the muscles around the knee and hip - for example, the large quadriceps muscle above the knee and the muscles that stop the hips from tilting when standing on one leg.
- Weak hip muscles may cause patellofemoral pain by causing the thigh bone to be slightly turned inwards, leading to the patella being pulled slightly to one side.
- Foot problems may also play a part - for example, where the feet do not have strong arches (flat feet). This makes the foot roll inwards (pronate), which means the knee has to compensate for the inward movement. However, it is unclear whether this *causes* the knee problems or may be *caused by* the knee problems.
- Injury to the knee - including repeated small injuries or stresses due to sports, or due to slack ligaments (hypermobile joints).

A combination of an alignment problem (see above) and overuse in sport is thought to be the most common reason for getting patellofemoral pain.

What is the treatment for patellofemoral pain?

In the short term

- Avoid strenuous use of the knee - until the pain eases. Symptoms usually improve in time if the knee is not overused. Aim to keep fit but to reduce the activities which cause the pain.
- **Painkillers** - **paracetamol** and/or **anti-inflammatory painkillers** such as **ibuprofen**.
- **Physiotherapy**:
 - Improving the strength of the muscles around the knee and hip will ease the stress on the knee.
 - Specific exercises may help to correct problems with alignment and muscle balance around the knee. For example, you may be taught to do exercises which strengthen the muscles of the hip and buttock.
 - The physiotherapist can give advice tailored to your individual situation.
- Taping of the kneecap (patella) - this is a treatment which may reduce pain. It involves adhesive tape being applied over the patella, to alter the alignment or the way the patella moves. Some people find this helpful. Some physiotherapists can offer patellar taping treatment.

In the longer term

- Treatment aims to treat some of the underlying causes - for example, by strengthening hip muscles and helping with foot problems:
 - Physiotherapy - a long-term home exercise programme, for at least one year.
 - Suitable footwear - for example, arch supports if you have flat feet; suitable shoes if you are running.

Surgery is no longer recommended, as there is no evidence that it is any better than other treatments.

What is the outlook?

The outlook (prognosis) is good. Most people get better with simple treatments such as physiotherapy. However, it may take 4-6 months for full recovery and, meanwhile, you may need to reduce activities such as sports training. Unfortunately symptoms may persist in 25% of people for up to 20 years but patellofemoral pain is an area of active research interest.

Further reading & references

- **van der Heijden RA, Lankhorst NE, van Linschoten R, et al**; Exercise for treating patellofemoral pain syndrome. *Cochrane Database Syst Rev*. 2015 Jan 20;1:CD010387. doi: 10.1002/14651858.CD010387.pub2.
- **Witvrouw E, Callaghan MJ, Stefanik JJ, et al**; Patellofemoral pain: consensus statement from the 3rd International Patellofemoral Pain Research Retreat held in Vancouver, September 2013. *Br J Sports Med*. 2014 Mar;48(6):411-4. doi: 10.1136/bjsports-2014-093450.
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