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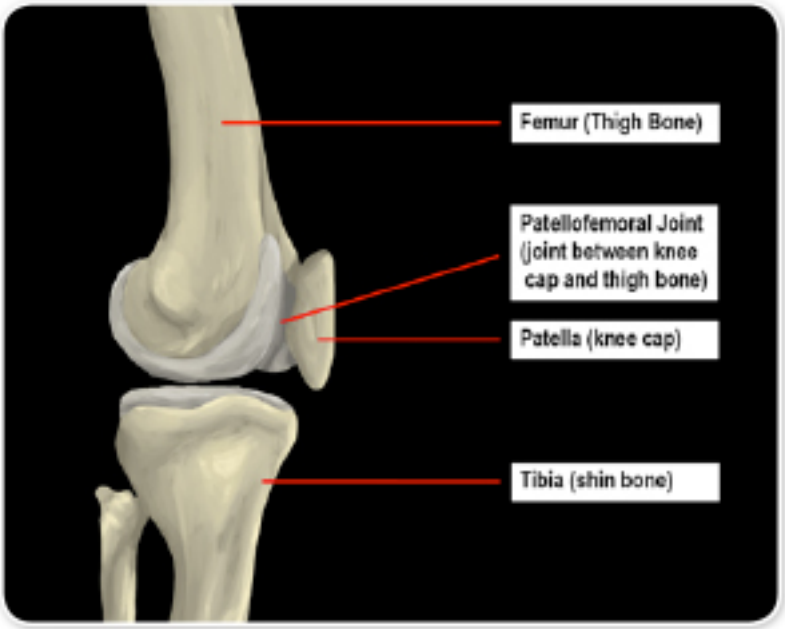
What is Patellofemoral Pain Syndrome?

Information for patients
Physiotherapy

What is Patellofemoral Pain Syndrome?

Patellofemoral Pain Syndrome (PFPS) is the name given to a common knee condition which causes pain at the front of the knee around the area known as the patellofemoral joint. This is the joint between the kneecap (patella) and the thigh bone (femur).



Pain is most commonly felt around or behind the kneecap. Symptoms are often experienced during activities such as sitting for too long, squatting, running, jumping and going up and down stairs.

PFPS usually responds well to management with specific exercise and lifestyle changes. It is very unlikely that surgery of any kind will be required.

What are the symptoms of PFPS?

Pain is the main symptom of PFPS. Pain can be felt as an ache at the front of the knee which can increase to a sharper pain with certain activities. Symptoms can range in severity from mild to severe. It can affect one or both knees.

Common symptoms include:

- Pain at the front of the knee, around and behind the kneecap
- Worsening pain during or after increased activity or exercise
- Pain after prolonged sitting
- Pain when squatting or going down stairs

Some people get a clicking or grinding noise when they bend or straighten the knee. This does not mean that you are causing damage and it is important to keep moving your knee joint.

How common is PFPS?

PFPS is one of the most common knee complaints and the most common overuse injury affecting the leg. Around a quarter of all adults and a third of adolescents may experience symptoms at some stage. The condition affects both men and women of all age groups but women are twice as likely as men to develop PFPS. It can affect those who participate in sporting activities as well as those who do not.

What causes PFPS?

PFPS usually occurs without an injury to the knee, but can very occasionally be as a result of an injury, such as a fall onto the knee. If you have not injured your knee, it may be difficult to find one specific cause of your PFPS, as it often occurs for a number of reasons. These include:

- Starting a new activity
- Increase in the intensity and/or frequency of an existing activity
- Following a period of reduced activity that leads to weakening of the muscles
- Muscle tightness or weakness around your hip and knee
- Unsupportive footwear such as high heels or very flat shoes
- Having a job which requires frequent, prolonged kneeling
- Being overweight

Why can overuse cause pain?

Depending on your day to day routine, you will have a level of activity that your knee is happy with. This can be thought of as your knee's comfort zone or happy place. Any sudden change to your daily activities which leads to putting more weight through your knee can take your knee out of its comfort zone. Examples of this might be working extra shifts and being on your feet more or a sudden change in your sporting activities such as increasing your running distance. This sudden change can cause the knee to become painful without any physical injury to it.

What can help with PFPS?

PFPS usually responds well to management with specific exercise and lifestyle changes. Only a handful of cases will ever require surgery.

Change your activity level

To ease the knee pain, it is recommended to pace yourself rather than stopping all forms of movement or exercise. Stopping all activity would result in muscles getting weaker which could lead to the knee pain getting worse. Instead, try to spread your activity out through the day with regular short rests. Break harder jobs down and do gentler activity in between.

When climbing stairs you may need to consider using handrails and go up one leg at a time until your muscles become stronger. It is easier to go upstairs leading with the non- painful leg and then come down with the sore leg leading.

If you only have pain while exercising try to reduce or change your exercise rather than stopping it completely. For example, if running causes you pain, reduce how long you run for or opt for a flatter route. Another option would be to choose an exercise you are more comfortable with (i.e. reduce the load on your knee) such as swimming or cycling and build up your leg strength that way. You may feel it is beneficial to reduce high impact exercise (two feet off the ground) to lower impact exercise (one foot on the ground at any one time). For example you could march instead of jogging in an exercise class.

Exercise

Exercise has been shown to be key in managing patellofemoral pain syndrome. There are three main types of exercise that can be beneficial:

- Stretching exercises
- Endurance exercises
- Strengthening exercises

Stretching exercises: Loosening tight muscles around the knee and hip can help reduce pain. For example hamstring, quadriceps and calf muscle stretches.

Endurance exercises: This includes exercises that work your muscles over a long period of time e.g. walking, running, cycling, swimming or aerobics. Choose an exercise that matches your fitness level and your pain level and aim to do it several times a week.

If you are used to exercising regularly but find your usual exercise painful you may need to reduce the amount you are doing or change exercise altogether (cross training) until your pain has improved.

If you are not used to exercising regularly you could try starting with a short walk a few times a week. Try to increase this as your pain allows.

Strengthening exercises: Building up the strength of your hip and knee muscles can reduce knee pain. Research shows doing combined hip and knee exercises are the most effective. Some examples of strength exercises include free or machine weights in the gym, squats, lunges, Pilates or yoga.

A good starting point would be to try the exercises shown in this leaflet. They are split into early, middle and later exercises. If your knee is particularly painful then we suggest you begin with the early exercises.

Early: Quads Squeeze

Lie on your back for example on your bed with your legs straight, push your knee downwards in to the bed contracting your thigh muscle, this should make the muscle at the front of your thigh tight. Hold for between 5 and 45 seconds and then relax.

Repeat this 5- 10 times, 1-3 times a day.

Early: Heel Slides

Lie on your back, for example on your bed with your legs straight in front of you gently slide the heel of the affected leg towards your bottom bending your knee and hip.

Repeat this 5-10 times , 1-3 times a day

Middle: Mini Squat

Stand with feet slightly wider than shoulder width apart with your hands on a supportive surface.

Stick your bottom out and allow your knees to bend, lowering yourself by a small amount.

Push your weight through your heels and squeeze your buttock and thigh muscles and return to the starting position.

Repeat this 5-15 times, 2-3 times every second day.

You can increase the difficulty of your exercise by reducing hand support.

Middle: Double Squat

Stand tall with feet hip width apart looking ahead. Bend your knees and push your bottom out as if going to sit down, you don't need to go too far. Reaching your arms forwards will help maintain your balance. Keep your heels on the floor and make sure your knees stay in line with your toes. Do not let your knees go beyond the tips of your toes. Slowly straighten your knees keeping the weight through your heels.

Repeat 5-15 times, every second day. You can make this exercise harder by squatting lower.

Later: Single Leg Squat

Hold on to a stable surface such as a chair or a worktop. Stand on the affected leg Keep the other leg bent behind you off the floor, slowly bend the affected knee over your toes pushing your hips back. Do not let the knee move beyond your toes. Slowly return to starting position.

Repeat 5-15 times, 1-3 times a day, every second day. You can make this exercise harder by squatting lower.

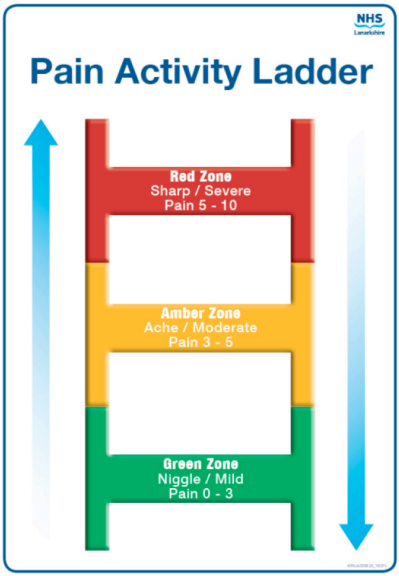
Later: Static Lunge

Hold on to a stable surface such as a chair or a worktop. Step your affected leg forwards, slowly bend your front knee, letting your back knee bend towards the floor then return to the starting position. You do not need to go too far, keep your front knee in line with your toes and do not let your front knee go beyond your toes. Keep the movement slow and controlled. Repeat this 5-15 times, 1-3 times a day and do this every second day.

You can make this exercise more challenging be reducing hand support.

Pain Activity Ladder

- By following the pain activity ladder which can be seen below, you can identify activities that you would consider severely painful, moderately painful and mildly irritating and act to change your habits.
- The pain scale, most often used in healthcare, measures pain from 0-10 (zero being no pain and 10 representing the worst pain you could imagine).
- If you can identify the level of pain you are experiencing, you will find out if you are in the green, amber or red zone. The best way to move down to the green zone is by pacing and spacing your activity.
- When you are completing your rehabilitation exercises it is often best to work within the green (and sometimes amber zones depending on what you deem is an acceptable level of pain) both during the exercises and within 48 hours of completing your exercises. If you find yourself in the red zone you are likely pushing yourself too hard and may flare up the pain.



What do I do if my symptoms flare up?

Flare ups of pain are common.

Some people have recurrent flare ups of pain so it is important to know how best to manage these flare ups. In most cases a pain flare-up will settle within 6 weeks.

Top Tips:

- You will likely find it helpful to rest a bit more but it is still important to keep active. This will help to avoid becoming stiff and your muscles becoming weak.
- If you aim to get a balance between rest and activity to should help your pain to settle down. You may be sore at first, however, start slowly and gradually increase the amount you do.
- Avoiding movements or tasks that aggravate your symptoms can also help especially in the early days
- Adopting positions or movements that reduce your pain can be useful

Helpful tips

- Wear well fitting, supportive trainers ideally supporting the arch of your foot
- If you are increasing any sporting activity do it gradually. Sudden increases can overload the patellofemoral joint and increase pain
- It is important to maintain good flexibility and strength in your thigh and calf muscles so a regular exercise programme is recommended
- Maintaining a healthy weight can help to reduce symptoms
- Avoid wearing high heeled shoes

If your symptoms continue to worsen or do not show signs of improvement after a period of 6-12 weeks of following the advice above, a self-referral to physiotherapy can be made on our website: **https://www.nhslanarkshire.scot.nhs.uk/services/physiotherapy-msk/** or via your GP.

Help and support

If, after following the above advice, your knee pain has not improved within 6-12 weeks a referral to a physiotherapist may be beneficial.

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