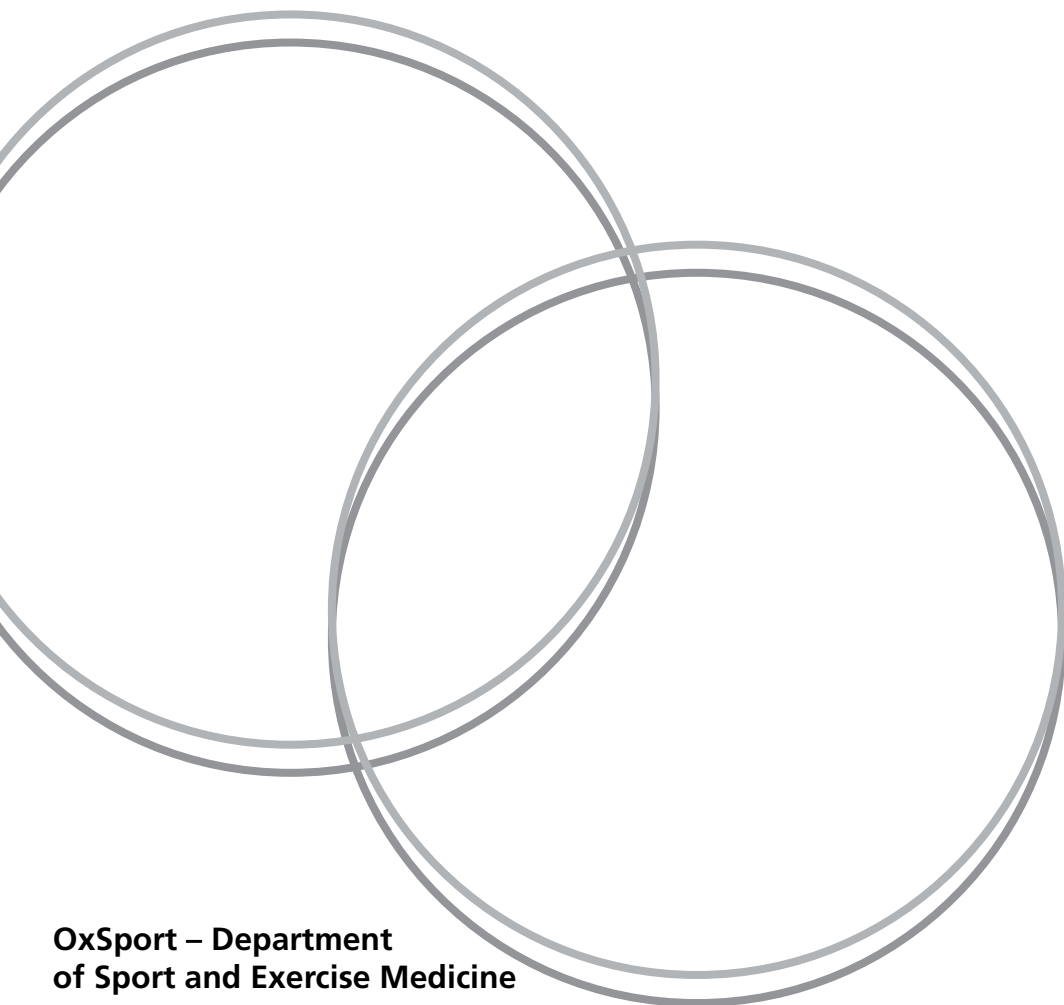


# **Patellar Femoral Pain Syndrome (PFPS)**

## **Advice and management**



This booklet has been written to help guide you through the management of your Patellar Femoral Pain Syndrome. It is important that you read this booklet, so you have a better understanding of the condition and its management.

## What is Patellar Femoral Pain Syndrome (PFPS)

PFPS is a common condition causing knee pain in both athletes and non-athletes, which can affect both men and women of all ages.

PFPS occurs due to overloading of the front of the knee, behind the kneecap. It is more common in people who take part in sport, particularly those whose sports involve running or jumping, such as tennis, football or badminton.

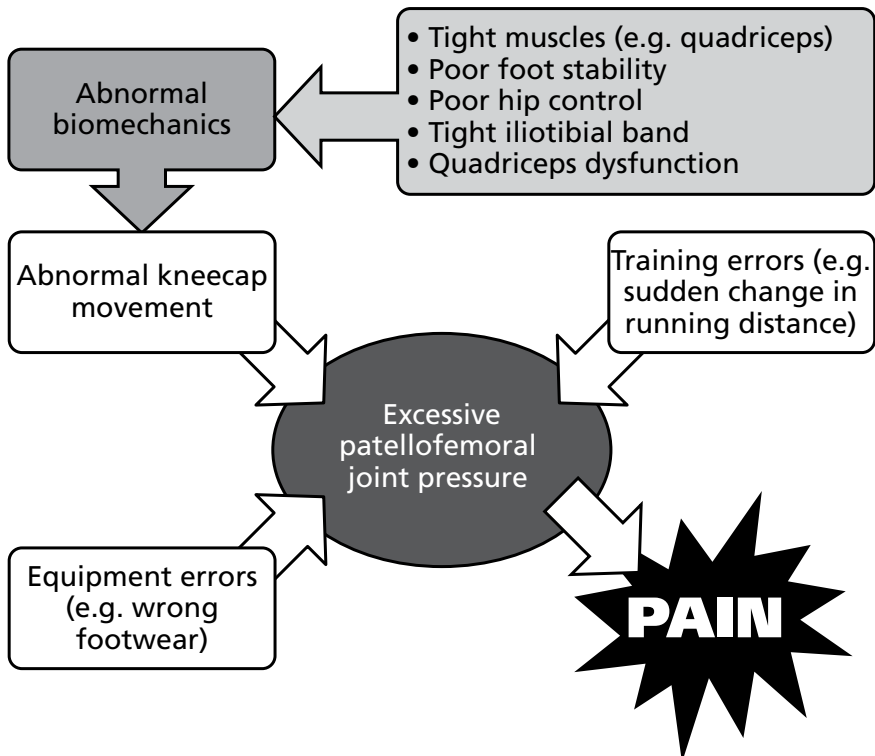
Sometimes you will hear this condition called anterior knee pain, chondromalacia patellae or patellofemoral disorder, but these mean the same thing as PFPS.

## What causes PFPS?

PFPS most often occurs without an injury to the knee, but can sometimes be 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 usually occurs due to a combination of factors. It is often associated with the start of a new activity, an increase in the intensity and/or frequency of an existing activity, or following a period of reduced activity that leads to weakening of the muscles.

There are many contributing factors, which can vary from person to person, but it is rare that they are all present. The diagram below shows some of the main factors which can contribute to the development of PFPS.

### *Factors contributing to the development of PFPS*



## What are the symptoms of Patellar Femoral Pain Syndrome?

Pain is the main symptom of PFPS. It can be felt anywhere around the kneecap and even at the back of the knee. It can affect one or both knees.

There are a variety of other symptoms that people with PFPS experience, including:

- clicking or clunking
- mild swelling
- a feeling of instability (like your knee might give way)
- pain when squatting or coming downstairs
- discomfort or pain when sitting for long periods (such as going to the cinema or taking long airplane journeys).

## X-rays and scans

We do not routinely use X-rays or scans (imaging) for the diagnosis of PFPS, as looking at your medical history and examining your knee is usually enough for us to make the diagnosis. If we do need to carry out imaging, this may be an ultrasound scan, X-ray, or MRI scan, to exclude other causes of knee pain.

MRI scans may show changes behind your kneecap (such as fraying of the cartilage) that are common in people both with and without PFPS. Findings like these often do not relate to your PFPS. Please discuss any findings from the scan with the doctor who requested the scan for you. They will let you know if the results of the scan are important or not.

## Treatment

A structured exercise programme is the best treatment for your PFPS. Research shows this to be the best therapy.

Before you begin your exercise programme, your doctor or physiotherapist will examine you. They will identify any particular problems you might have with specific muscle groups. They will also look at how well you are moving and recommend some specific exercises for you to do as a 'home exercise programme'.

You may also be referred for a course of physiotherapy, if you need someone to work more closely with you during your rehabilitation. If this is the case, your physiotherapist may use additional techniques to help with your rehabilitation, such as using tape which is stuck to your skin to help support your knee, or soft tissue techniques.

Pain can sometimes stop you from rehabilitating properly with PFPS, because it can make it very hard to train your muscles effectively. As well as regular painkillers such as paracetamol and ibuprofen, we may suggest you take other sorts of painkillers to help control your symptoms better and enable you to strengthen your muscles.

You may also be referred to an orthotist, who specialises in assessing your foot biomechanics (how the bones, muscles and tendons move). They may prescribe shoe inserts called 'orthotics'. These will help change your foot posture, if this is contributing to your PFPS.

## HOME EXERCISE PROGRAMME

This home exercise programme is divided up into specific sections, each addressing different issues that can cause PFPS. It includes:

- stretches
- strengthening
- balance exercises
- core stability (strengthening the muscles around your tummy and pelvis)
- plyometrics (powerful movements, such as jumping).

Sometimes, while doing the exercises, you may feel an increase in your symptoms around your knee cap. This is normal and you will find that as you progress with your exercises your symptoms will improve. You may not feel the benefits of the exercises until approximately 3 months after starting, so it is important that you continue with the programme.

## Stretches

***Hold for 1 minute on each muscle group.***

When stretching you should not push the stretch into pain. You should instead feel a strong stretching sensation, which should ease off when you stop.

You should hold a continuous stretch and not bounce at the end of the movement.

The following programme is designed to help with flexibility of the whole leg.

### **Gastrocnemius muscle stretch**

*(right leg stretch shown in picture)*



Step forwards with your **left** leg, leaving your right leg behind you and straight.

Lean forwards, while keeping your **right** heel on the floor. You should feel a stretch at the back of your **right** calf muscle.

Hold for one minute, then slowly release and switch legs.

## Soleus muscle stretch

*(right leg stretch shown in picture)*



Prepare as for the previous stretch (gastrocnemius), but do the stretch with your **right** knee bent, not straight.

You should feel a stretch in the lower part of your **right** calf muscle.

Hold for one minute, then slowly release and switch legs.

## Quadriceps muscle stretch

*(right leg stretch shown in picture)*



Bend your **right** knee and grab hold of your **right** ankle with your **left** hand.

Make sure your knees are together, then push your **right** hip backwards.

You should feel a stretch at the front of your **right** leg.

Hold for one minute, then slowly release and switch legs.



## Gluteus stretch

*(right leg stretch shown in picture)*



Lying on your back, place your **right** foot against a wall in a relaxed position

Raise your **right** leg and place your **right** ankle onto your **left** knee.

You should feel a stretch in your **right** buttock.

To increase the stretch, move closer to the wall.

Hold for one minute, then slowly release and switch legs.

## Hamstring stretch

*(right leg stretch shown in picture)*



Lying on your back, raise your **right** leg and hold behind your knee with both hands.

In this position, straighten your **right** knee as far as it will go.

You should feel a stretch at the back your **right** leg.

Hold for one minute, then slowly release and switch legs.

## **Iliotibial band soft tissue release, using a tennis ball or foam roller**



Lie on your side with your tennis ball or foam roller under the middle of the outside of your thigh.

Move your body up and down, rolling the ball or roller along the outside edge of your leg.

Do this for 30 seconds to 1 minute on each leg.

# Strengthening exercises

## Wall slides



Stand with your back against the wall and feet shoulder width apart, about a foot away from the wall.

Slide down the wall, keeping your shoulders back until you start to feel any discomfort, then slide back up the wall.

Gradually build up to a knee bend of 90° (a right angle).

When you can achieve a 90° knee bend, you can add in squeezing a ball in between your knees whilst doing this exercise.

## Forward lunge



For this exercise your front leg should be your affected leg.

Starting in a standing position, step forward into a lunge position, as shown in the picture.

Keep your body upright and do not let your leading knee go beyond your toes. The knee of your trailing leg should not be touching the floor.

## Proprioception

### **(balance awareness)**

Stand on your affected leg for 1 minute, without putting your foot down, to challenge your balance.

If you are able to do this for 1 minute, try to do the same exercise with your eyes shut for 1 minute.

If you are able to do this, then progress to standing on an unstable surface (such as a folded towel).

Make sure at all times that you are in a safe environment, so you do not lose your balance and injure yourself.



## Core stability

Core stability concentrates on strengthening the muscles around your pelvis and tummy. You need good muscular control of your pelvis, as this acts as the stable base from which your legs move. Without a stable pelvis, the forces going through your legs can be increased and unpredictable, which can lead to injury.

To engage your deep tummy muscles (transverse abdominus), think about pulling your belly button inwards. Imagine that you are trying to do up a pair of trousers that are a size too small. While doing this, do not hold your breath!

You should feel your tummy muscles tighten slightly. You can feel this if you place your fingers over the lower part of your tummy. When doing the core stability exercises, make sure you engage your tummy muscles before doing each exercise.

### **Lower and lift**

Lying on your side, engage your tummy muscles.

Raise your uppermost leg approximately 6 inches off the ground, then lower it again to the start position.

While moving your leg, do not let your pelvis move.

Repeat 50 times, then switch to the other side.



## **Bridging level 1**



Lie on your back with your knees bent.

Engage your tummy muscles.

Tilt your pelvis backwards, as if pressing your lower back into the floor.

Squeeze your bottom muscles together.

Slowly lift your pelvis and back off the floor to the bridge position shown.

Hold for 5 seconds and then slowly return back to the starting position.

Build up to doing 30 repetitions.

Progress to level 2 when you are able to comfortably do 30 repetitions.

## **Bridging level 2**



When in the bridge position, take one leg off the floor without letting your pelvis move.

Hold for 10 seconds then relax.

Aim for 20-30 repetitions, switching legs each time.

## Clam level 1



Lie on your side with your knees bent (you should do this exercise on both sides).

Engage your tummy muscles.

Keep your heels together and lift your uppermost knee towards the ceiling.

Lift your knee as high as you can, stopping when your pelvis starts to roll backwards.

Slowly lower your knee to the start position.

You should feel a 'burning' sensation in your 'back pocket' area.

Repeat 40 times then switch to the other side.

Progress to level 2 if you are able to comfortably do 40 repetitions.

## Clam level 2



Carry out the previous exercise, but keep your feet off the floor while lifting your uppermost knee.

Repeat 40 times then switch to the other side.

Progress to level 3 if you are able to comfortably do 40 repetitions.

## Clam level 3



Still lying on your side, hook your uppermost foot behind the knee of the leg that you are lying on.

Lift the bent knee leg up as far as it will go before your pelvis rolls backwards. Then lower down.

Repeat 40 times then switch to the other side.



## Plyometric exercises

Plyometric exercise is a form of resistance training which increases muscle power. It can increase the power of a muscle contraction, for example to enable you to jump higher or jump further.

Plyometric exercise refers to the ability to jump upwards or forwards, land from a height, or a combination of movements working the muscles against gravity.

You should carry out plyometric exercises when you have progressed through the other stages of your rehabilitation programme. You should also start to do exercises that mimic the movements you make in your sport, so you are ready for your return.

However, plyometric exercises should only be performed once or twice a week when you are feeling fresh, as the demand on the muscles has a greater potential for injury. The plyometric exercise should be performed on a surface that is not too hard, such as a foam mat or on soft ground. You should also carry out a warm up before you start your plyometric exercises.

## **Hop to stop**

Standing on your affected leg, try to hop as high and as far forwards as you can.

The aim is to land on the same leg, but not to lose your balance. When you land, try not to place your other leg on the ground to steady yourself. Try to keep the knee of your landing leg stable over your foot.

You will benefit from doing this on a soft, non-slip surface, such as a mat or on grass.



## Squat jumps

Stand on a soft, non-slip surface, such as a mat or on grass.

Start from a squatting position with both legs.

Jump as high as you can.

Do not land with your legs locked straight, but try to absorb the landing in a squatting position, keeping your knees lined up over your toes.



## Frequently asked questions

### **How long will it take for the exercises to work?**

Strengthening muscle or altering muscle length through stretching takes time. It is recommended that you should do the exercises for at least 3 months.

### **How often should I do the exercises?**

We recommend doing the stretching, strengthening, core stability and proprioception exercises every day. Try to make them part of your daily routine.

When you have progressed to the plyometric exercises, we recommend that you do these once or twice a week, in addition to the above.

### **Will I be referred for physiotherapy?**

You may be referred for physiotherapy if the physiotherapist wants to use other treatments that will assist in your recovery.

### **What happens if I do not respond to the treatment?**

If you feel you are not making satisfactory progress after 3-6 months, we will be happy to see you again in clinic or physiotherapy for further assessment.

### **When can I go back to my sport?**

This solely depends on how much pain you are in. If you have a lot of pain and are not able to compete in your sport, it may be advisable to rest from your chosen sport during your recovery. If you only have mild discomfort then it can be OK to take part in sport. Participating in sport with pain from PFPS does not mean that you are damaging your knees; it just means that doing sport will be uncomfortable.

### **Will rest help?**

Rest will, to some extent, help reduce your symptoms. However, rest will not reverse the underlying causes, such as weak muscles.

Therefore, although rest may reduce symptoms, people find their pain generally returns when they start to exercise again

Cross training is useful while you are unable to do your preferred activity. Cross training refers to taking part in a variety of other sports to maintain your fitness. We can help advise you on sports which put less stress through your knees, such as swimming instead of running.

### **I'm a runner, how often should I change my trainers?**

The rule of thumb is that you should have at least two pairs of trainers on the go and it is recommended that you change your trainers every 300 to 500 miles.

### **I was given a pair of orthotics, should I put these in the trainers that I run in?**

We recommend that you only put the orthotics in your trainers if your trainers are 'neutral' trainers. This means that they do not already have a built in arch support. If you are not sure whether your shoes have arch support, show them to your doctor or physio. Alternatively, they will also be able to tell you this in good shoe shops.

### **Will I need surgery on my knee?**

No. True PFPS does not require surgery, as there is generally nothing to operate on.

### **Will I need a scan of my knee?**

Not usually. However, if you do not respond to treatment you may need an MRI and/or X-ray. These will show us if there is an underlying reason which might explain why physiotherapy did not work. If we find another problem with your knee, such as a cartilage tear, then we will discuss your case with a knee surgeon. They will review your treatment and advise if surgery may be helpful.

## Helpful training tips

- If you want to increase your running distance or time, only increase this by 10% each week.
- Renew your trainers every 300 to 500 miles. Consider having two pairs of trainers 'on the go' at the same time.
- Vary your training. Combine different speeds, distances and times during your training period. This will allow your knee to adapt to the loads placed upon it.
- Plan your training regime. Access online help, such as the NHS Choices 'Couch to 5K'. Website:  
[www.nhs.uk/live-well/exercise/couch-to-5k-week-by-week](http://www.nhs.uk/live-well/exercise/couch-to-5k-week-by-week)

Make training more fun. Vary your exercise in different ways, to train other parts of your body. This is termed 'cross training' and is a valuable method of reducing injury by distributing the loads placed upon your body.

## Cross training

**Here are some examples of cross training that you may find useful:**

- Swimming
- Spin classes
- Pilates
- Circuits
- Gym equipment
- Rowing
- Weight training
- Aerobics
- Alternative sport
- Cycling

## How to contact us

### **Physiotherapy, Horton General Hospital**

Tel: **01295 229 432**

(8.00am to 5.00pm, Monday to Friday)

### **Physiotherapy, John Radcliffe Hospital**

Tel: **01865 221 540**

(8.00am to 5.00pm, Monday to Friday)

### **Physiotherapy, Nuffield Orthopaedic Centre**

Tel: **01865 741 155**

(8.00am to 5.00pm, Monday to Thursday;

8.00am to 4.30pm, Friday)

*If you have any problems or questions at any stage throughout your rehabilitation, please speak to your Physiotherapist or Doctor for advice.*

If you need an interpreter or would like this information leaflet in another format, such as Easy Read, large print, Braille, audio, electronically or another language, please speak to the department where you are being seen. You will find their contact details on your appointment letter.

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