Patello-femoral pain (PFP)

Your physiotherapist has diagnosed you with Patello-femoral pain syndrome. This booklet provides information on what this means and how physiotherapy can help.
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What is the Patello-femoral joint?
It is formed by contact between the knee cap (patella) and the thigh bone (femur). The knee cap normally sits in a snug groove on the end of the thigh bone.

The knee cap acts as a lever for muscles controlling movement of the knee. These movements are controlled by a number of muscles that connect to the knee cap. Together, these muscles help to stabilise the knee cap and keep it running smoothly within the groove.
What is Patello-femoral pain (PFP)?

PFP is pain in, around and/or under the knee cap. This is most commonly known as ‘anterior knee pain’ and also known as ‘patella mal-tracking’, ‘chondromalacia patellae’. Activities that commonly aggravate PFP are bending, prolonged sitting, squatting, kneeling, walking, climbing stairs, running and jumping.

Additional symptoms can include stiffness, a sensation of catching, clicking or grinding.

What are the causes?

There are no specific causes for PFP, but there are a range of possible factors, which increase your risk of developing it. Your PFP is unique to you, and factors contributing towards your PFP may be different than someone else with the same diagnosis.

Contributory factors

- **Load tolerance**

Depending on what you usually do, you will have a level of activity that your knee is happy with (a load tolerance level). Excessive loading or varied and rapid increases in load can increase sensitivity in your knee, without causing physical injury or damage.
• **Strength**
Pain at the front of the knee can limit how well your quadriceps (front thigh muscles) work, and over time cause weakness. Weak quadriceps, especially the inside thigh muscle (also known as VMO) can affect the movement of the knee cap as you do activities, potentially causing further irritation, but not damage. Looking above the knee, weak hip and bottom muscles (glutei muscles) can impact on the **control of single leg movements** like climbing stairs and walking.

• **Movement biomechanics**
Having strong muscles is key, but it’s also important to have muscles that work efficiently to control your movement – **above, at and below the knee**. A lack of movement control can contribute towards irritation of PFP.

• **Tightness**
Tight or restricted movement can **reduce range of movement** and effect **loading efficiency**. Common areas of tightness are the thigh muscles (quadriceps and hamstrings), outside of your thigh (ilio-tibial band) and calf muscles.

• **Feet biomechanics**
Flat feet or feet that roll in too much, can cause **altered movement mechanics** further up the leg and altered strain for the knee cap.

• **Natural body shape**
The natural position of your hip, knee and feet bones can increase the chances of PFP.
How is it treated?

- **Pain killers** can be used to provide temporary relief. This will give muscles an opportunity to work better.
- **Physiotherapy** is the **most effective** method of management for PFP. Some people will also benefit from seeing a **Podiatrist** (foot specialists).
- **Surgery** for PFP may be considered as a **last resort** once all other methods of management for the condition have been explored.

Surgery can be used to correct the muscle, bony and joint physical positions. However surgery cannot improve the effectiveness of muscles. In general, surgical success rates are low for PFP.
How will physiotherapy help?
Physiotherapy will identify the dominant ‘contributory factors’ and provide a specific, targeted rehabilitation program.

This will help to reduce strain through the knee by stretching tight structures, strengthening weak structures, improving your movement control and improving your load tolerance.

Successful management requires adherence to a regular exercise program outside of physically attending physiotherapy appointments. Alongside your exercise programme, this may include resting from aggravating activities and working to gradually build them back up over time.

How long will it take to get better?
- There are no quick fixes with PFP
- We would expect to see improvements with rehabilitation over a 3-6 month period.
- However, improvements can continue beyond this.
- Maintenance of your specific exercise programme is crucial in sustaining improvements.

You may need to continue indefinitely to ensure that your problems do not return. Most people will get back to normal function including sport.
What will happen to the pain?
Fortunately most people will gain somewhere between 60% and 80% improvement with physiotherapy.

Although you may experience discomfort from time to time most of you will return to your normal activities.

How do I manage ongoing pain?
You may sometimes get an increase to your pain, with or without warning. This is normal with patello-femoral joint problems. It is important to reduce the effect from these ‘flare-ups’ as quickly as possible. During a flare up, aim to reduce your accumulative load by regressing your exercises and daily activities. Over time, gradually build back up your normal activity levels.

The use of ice or heat and pain killers may offer some temporary relief, whilst you are building your daily activities back up. With the correct management, flare-ups can be well controlled allowing you to continue with normal activities.
Exercises in pictures

Stretches: Calf

Stretches: Quadriceps

Stretches: Hamstrings

Stretches: Foam rolling
Quads: Leg press. Double leg

Quads: Leg press. Single leg
Quads: Squat

Quads: Step down. Front view
Quads: Step down. Side view

Quads: Wall slide
Quads: ‘VMO’ lunge

Quads: Progression of lunge
Quads: Single leg dip

Glutes: Double leg bridge

Glutes: Single leg bridge
Glutes: Side lying hip abduction

Glutes: Standing hip extension and abduction
Glutes: Hip turn out

Glutes: Side and front crab walk
Contact us
If you have any questions or concerns please contact the Physiotherapy Department, t: 020 7188 5094, Monday to Friday, 8.30am to 5.00pm

Notes
**Exercise Prescription**

The load, volume and frequency of exercise will depend of your training goals. These two pages show a chart summarising key training markers to guide your exercise prescription.

<table>
<thead>
<tr>
<th>Required outcome</th>
<th>Action</th>
<th>Load % of 1RM</th>
<th>Number of reps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor control</td>
<td>Variable</td>
<td>Light load &lt;30%</td>
<td>20+</td>
</tr>
</tbody>
</table>
| Maximal Strength                          | Ecc/ con/ iso | Novice to Intermediate 60-70%  
Advanced 80-100% | 8-12          |
| Power                                     | Ecc/ con    | Upper body 30-60%  
Lower body 0-60%  
Advanced 85-100% | 3-6           |
| Hypertrophy                               | Ecc/ con/ iso | Novice to Intermediate 70-85%  
Advanced 70-100% | Novice to Intermediate 8-12  
Advanced 1-12 |
| Endurance                                 | Ecc/ con/ iso | ‘Multidimensional’  
Light loads with high reps and moderate loads with fewer reps | Novice 10-15  
Advanced 10-25 to fatigue |
| Older adults Strength + hypertrophy power |             | 60-80%  
30-60% | 8-12  
6-10 |
<table>
<thead>
<tr>
<th>Number of sets</th>
<th>Rest period (minutes)</th>
<th>Repetition velocity</th>
<th>Frequency per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prior to strength work</td>
<td>&lt;1 min</td>
<td>Focus on control rather than velocity but can vary</td>
<td>5-7 Twice daily</td>
</tr>
<tr>
<td>3-5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-3</td>
<td>2-3 min</td>
<td>1:1:1</td>
<td>Novice 2-3 Intermed. 3-4 Advanced 4-6</td>
</tr>
<tr>
<td>Multi-joint</td>
<td>2-3 min</td>
<td>Explosive tempo</td>
<td>Novice 2-3 Intermed. 3-4 Advanced 4-6</td>
</tr>
<tr>
<td>1-3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Novice to Intermed. 1-3</td>
<td>Novice to Intermed. 1-2</td>
<td>Novice slow to moderate Advanced – mixture of speeds</td>
<td>Novice 2-3 Intermed. 4 Advanced 4-6</td>
</tr>
<tr>
<td>Advanced 3-6</td>
<td>Advanced 2-3 min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>‘High-volume Multiple sets’</td>
<td>1-2 min for high reps (15-20)</td>
<td>Moderate to fast velocity for high reps Slow velocity for lower reps</td>
<td>Novice 2-3 Intermed. 3 Advanced 4-6</td>
</tr>
<tr>
<td></td>
<td>&lt; 1 min for moderate reps (10-15)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-3</td>
<td>1-3 min</td>
<td>Slow to moderate High rep velocity</td>
<td>2-3</td>
</tr>
<tr>
<td>1-3</td>
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<td></td>
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</tr>
</tbody>
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Useful information

Pharmacy Medicines Helpline
If you have any questions or concerns about your medicines, please speak to the clinical nurse specialist or other member of staff caring for you or call our helpline.
**t:** 020 7188 8748 9am to 5pm, Monday to Friday

Your comments and concerns
For advice, support or to raise a concern, contact our Patient Advice and Liaison Service (PALS). To make a complaint, contact the complaints department.
**t:** 020 7188 8801 (PALS)  
**e:** pals@gstt.nhs.uk  
**t:** 020 7188 3514 (complaints)  
**e:** complaints2@gstt.nhs.uk

Language and Accessible Support Services
If you need an interpreter or information about your care in a different language or format, please get in touch:
**t:** 020 7188 8815  
**e:** languagesupport@gstt.nhs.uk

NHS 111
Offers medical help and advice from fully trained advisers supported by experienced nurses and paramedics. Available over the phone 24 hours a day.
**t:** 111

NHS Choices
Provides online information and guidance on all aspects of health and healthcare, to help you make choices about your health.
**w:** www.nhs.uk

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