

Knee Cases in GP

Five real knee stories — spot the clues, make the diagnosis.

Knee pain is one of the commonest reasons people come to a GP surgery. Most of it is not serious — but you must never miss the few cases that are. This teaching aid puts the **cases first**. Read each story, look for the clues, and decide the diagnosis *before* you read the answer. The anatomy and the “why” come afterwards, for when you want to go deeper.

Ⓞ GOLDEN RULE 1

Patellofemoral pain syndrome (PFPS) wears many disguises. The same problem can look completely different from one patient to the next.

▲ GOLDEN RULE 2

Pain in **BOTH** knees? Think **systemic disease first** — before you settle on a local cause.

A The cases

1 Amanda, 14

TEENAGE ATHLETE

Amanda is 14 and a promising cross-country runner. She has pain at the **lower edge of her left kneecap**. It is slowly getting worse and now stops her doing all the sports she loves. She and her parents are fed up that her season has been cut short.

🔍 CLUES IN THE STORY

- ▶ Teenager, and a girl
- ▶ Pain around the kneecap
- ▶ No injury, no swelling, no locking, no red flags
- ▶ Very active in sport
- ▶ Worse with activity

DIAGNOSIS

Patellofemoral pain syndrome

Anterior knee pain is common in teenagers, commoner in girls, and worse after sport.

2 Michael, 48

WEEKEND HILL-WALKER

Michael is 48 and has taken up long-distance walking again. After a weekend in the Lake District he has pain around **both kneecaps, much worse going downhill** — so bad that he had to cut a walk short and sit with his knees held straight to ease it.

🔍 CLUES IN THE STORY

- ▶ Both kneecaps
- ▶ Much worse going downhill
- ▶ New, unaccustomed activity
- ▶ Eased by keeping the knee straight

DIAGNOSIS PFPS — overload type

Going downhill loads the kneecap heavily and tires the quadriceps. A straight knee unloads the joint.

3 Stephanie, 25

OFFICE WORKER

Stephanie is 25 and works in an office. She has pain around and below her right knee and a **“locking” feeling** that began during a step-aerobics class; the knee was swollen the next morning. Her notes show one earlier episode: **“painful effusion R knee after aerobics — X-ray and bloods normal — treated with rest, Tubigrip and an NSAID.”**

CLUES IN THE STORY

- ▶ Young woman
- ▶ Pain around & below the kneecap
- ▶ A previous identical episode that fully settled — with normal X-ray and bloods
- ▶ Repetitive knee-bending exercise
- ▶ A “catching” feeling, not true locking

DIAGNOSIS PFPS, again

PFPS can feel like “locking” and cause a mild effusion. Normal tests and full recovery point away from anything sinister.

i Don't confuse “catching” with true locking

True mechanical locking — the knee physically stuck, unable to straighten fully — suggests a **meniscal tear or loose body**. Examine carefully and consider referral. PFPS gives a softer **“catching”** sensation that releases on its own.

★ KEY MESSAGE

Three patients. Three very different stories. One diagnosis.

Amanda, Michael and Stephanie all have **patellofemoral pain syndrome**. This is the heart of the lesson: **PFPS presents in many disguises.**

Amanda · teenage runner

Michael · downhill hill-walker

Stephanie · “locking” after aerobics



PFPS

! STOP — pain in BOTH knees. Think systemic disease first.

Before you settle on a local cause for any bilateral knee pain, you **must** actively rule out systemic disease. Ask about and check for: other painful joints, morning stiffness lasting more than 30 minutes, rashes, fever, weight loss, or feeling generally unwell. **Bilateral joint pain can be the first sign of inflammatory or systemic arthritis.**

4 Jemima, 14

BALLET & GYMNASTICS

Jemima is 14, tall and slim, and lives for ballet and gymnastics. She has pain at the front of **both knees**, made worse by her activities. You take the warning above seriously and find no systemic features.

CLUES IN THE STORY (ONCE SYSTEMIC DISEASE IS EXCLUDED)

- ▶ Bilateral anterior knee pain
- ▶ No systemic symptoms
- ▶ **The big clue: ballet and gymnastics** — these activities attract very flexible (bendy) young people

DIAGNOSIS Joint hypermobility

Very flexible joints can cause aching, including PFPS-type pain. Check the Beighton score.

What's changed — the name has been updated

What used to be called “**benign joint hypermobility syndrome**” is now called **hypermobility spectrum disorder (HSD)** — part of a spectrum that includes hypermobile Ehlers-Danlos syndrome. Assess generalised flexibility with the **Beighton score**. The main treatment is **muscle strengthening and physiotherapy** to protect the joints — there is no cure.

B Before you call it PFPS — clear the red flags

PFPS is a **diagnosis of exclusion**. You must rule out the serious causes first. If any of these are present, do **not** manage as simple knee pain.

| Warning sign | Think of... | What you must do |
|--|---|--|
| Hot, swollen, very painful joint ± fever / unwell | Septic arthritis | Emergency. Refer to hospital / orthopaedics the same day. Do NOT delay. |
| Pain at night or at rest, unexplained weight loss, a mass | Bone tumour | Urgent referral on a suspected-cancer pathway. |
| Significant injury, can't weight-bear, deformity, swelling within hours | Fracture / ligament rupture / haemarthrosis | Refer to the emergency department. |
| True mechanical locking — knee stuck, can't straighten fully | Meniscal tear / loose body | Examine; refer to MSK / orthopaedics. |
| Several joints affected, morning stiffness > 30 min, persistent swelling | Inflammatory / systemic arthritis | Refer urgently to rheumatology. |
| Older patient, sudden severe knee pain | Spontaneous osteonecrosis (SONK) | Refer urgently to orthopaedics. |

✓ Safety net

If none of these red flags are present and the picture fits PFPS, manage conservatively — but always **review**, and **refer if the patient is not improving after 6 weeks** of conservative treatment.

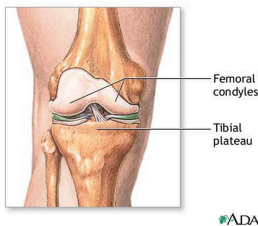
The theory — for when you want to go deeper

Now the cases make sense, here is the knee behind them: the anatomy, what PFPS is, why it hurts, and how to treat it.

1 Know the knee — quick anatomy

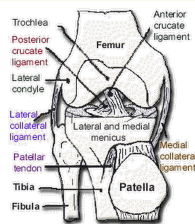
The knee is the **biggest joint in the body** and the most commonly injured in sport. Good diagnosis starts with the anatomy. Three simple ideas explain most knee problems:

- ◆ **It is a hinge — with a twist.** The knee bends and straightens like a hinge, but it also allows a small, controlled amount of rotation. Losing control of that rotation is a key part of many knee injuries.
- ◆ **It has almost no bony stability.** The round femoral condyles simply rest on the flat tibial plateau. The wedge-shaped **menisci** spread the load and carry up to **80%** of the weight passing through the knee. Lose them, and long-term problems follow.
- ◆ **Ligaments and muscles hold it together.** Collateral ligaments stop side-to-side movement; the central cruciate ligaments stop excess rotation and front-to-back movement. The muscles are the active stabilisers.



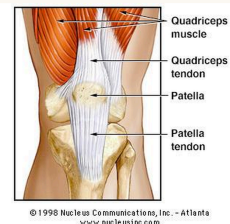
No bony stability

Round femoral condyles rest on the flat tibial plateau.



Ligaments & menisci

Cruciates centrally, collaterals at the sides, menisci between.



The quadriceps pulley

Quadriceps pull through the patella and patella tendon.

✓ The patellofemoral joint — the key to PFPS

The patella is the largest **sesamoid bone** in the body and works as a **pulley** for the quadriceps. As the knee bends, the patella must glide smoothly ("track") in the groove at the end of the femur. The balance between the **inner (vastus medialis)** and **outer (vastus lateralis)** quadriceps controls this tracking. When that balance is off, the kneecap rubs — and you get anterior knee pain.

2 What is PFPS?

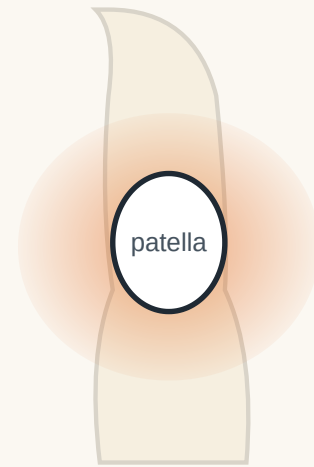
PFPS is pain at the front of the knee coming from the patellofemoral joint, with no other structural cause found. It is a diagnosis of exclusion.

A useful comparison: PFPS is a bit like low back pain — very common, and often impossible to tie to one exact piece of damage. That is normal, and does not mean you have missed something.

Who gets it: it is very common in young, active people — especially adolescent girls and young women. It is often felt in both knees and is worse after sport.

What makes it worse: squatting, kneeling, breaststroke, jumping, going down stairs and steep hills, and sitting with bent knees for a long time — the classic “**cinema sign**” (driving, or a long film).

On examination: often little to find — perhaps tenderness when you press the kneecap against the femur. A **normal examination does not rule out PFPS**.



The cartilage has a poor nerve supply, so the ache is **diffuse** and often comes on gradually after activity.

3 Why does it hurt? The simple biomechanics

Three ideas explain almost all of PFPS.

- 1 The knee is a giant lever.** The femur acts as a lever, pivoting (the fulcrum) on the tibial plateau. The whole upper-body weight presses down at the top, and the quadriceps must pull through the patella to balance it. On stairs and hills these forces become **enormous** — and they all meet at the kneecap.

Think of the femur as a lever

QUADRICEPS · PATELLA

short arm



FULCRUM
(tibial plateau)

BODY WEIGHT

long arm

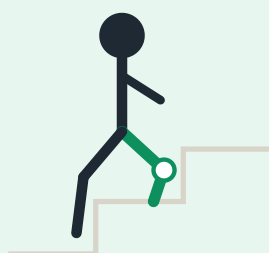
On stairs and hills these forces are enormous — and they all meet at the kneecap.

- 2 Lowering is harder than lifting.** When a muscle **shortens** as it works, that is a **concentric** contraction. When it **lengthens** while still working, that is an **eccentric** contraction — and eccentric work is much harder, so the muscle tires sooner.

Dumbbell analogy: lifting a dumbbell, your biceps shortens (concentric, easy). Lowering it slowly, your biceps lengthens while holding the weight (eccentric, hard). Now map it to the knee: **stepping up = concentric; stepping down = eccentric**. That is exactly why going **downhill** hurt Michael more than going up.

STEPPING UP

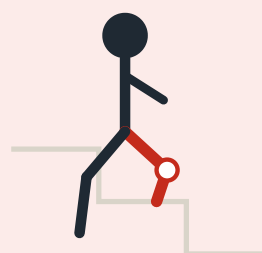
quadriceps shortens as it works



Concentric · easier

STEPPING DOWN

quadriceps lengthens as it works

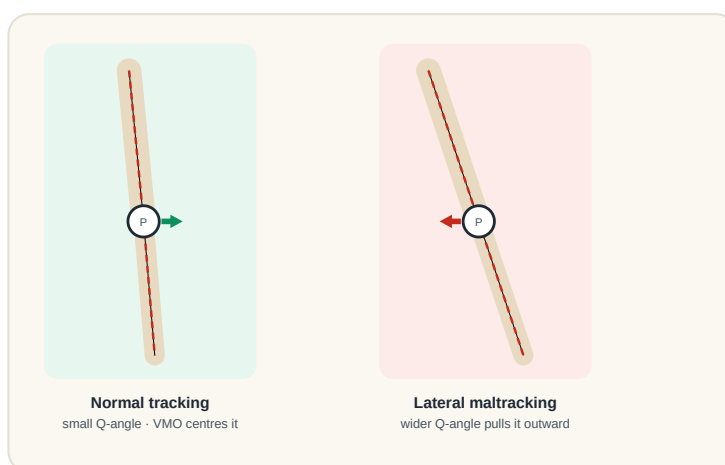


Eccentric · harder, tires sooner

3 The kneecap can drift off-track (maltracking). Normally the quadriceps keep the patella centred in its groove. If the pull is unbalanced, the patella slides outwards and rubs.

Common reasons for maltracking:

- ◆ **The adolescent growth spurt.** In girls the pelvis widens, which increases the **Q-angle** (the angle of pull on the patella) and tugs it outwards. As growth finishes the angle settles — which is why **time alone** can cure the teenager.
- ◆ **A weak or tired vastus medialis** — the inner quadriceps that pulls the patella back in. Common when the other quads are trained more, or when it tires first (e.g. an unaccustomed descent of steep hills — Michael again).
- ◆ **Flat feet** (a dropped arch) can pull the whole leg out of line.



4 Managing PFPS — Recognise → Act → Refer

✓ Recognise

Front-of-knee pain, worse on stairs, hills and prolonged sitting, with a normal-ish examination and no red flags. **Explain and reassure:** this is common, not dangerous, and usually settles — but slowly. Cartilage has a poor blood supply and heals slowly, so **patience matters**.

Act — the mainstay is correcting the muscle balance and reducing the load:

- ◆ **Physiotherapy is first-line.** Exercises to strengthen vastus medialis, plus the hip and core muscles. Refer to an MSK physiotherapist.
- ◆ **Teach the exercises yourself** if you can, using a physiotherapy exercise sheet — 10–15 minutes well spent.
- ◆ **Modify activities.** Keep the knee straighter where possible; sit on the aisle at the cinema; raise the bike saddle and use easier gears.
- ◆ **Taping** the patella can give short-term relief by resisting the outward pull. A physiotherapist can show the patient how.
- ◆ **Check the feet.** If not improving, assess foot posture and gait; refer to a podiatrist for a biomechanical assessment if needed.
- ◆ **Medication plays little part.** Do not rely on drugs to treat PFPS.

! Refer wisely — avoid unnecessary surgery

Arthroscopy is not the treatment for PFPS when there is no structural damage. Refer to orthopaedics **only** if the patient fails physiotherapy *and* any foot problem has been corrected. A small number have a tight lateral band and may be considered for a lateral release. **Refer if not improving after 6 weeks of conservative management.**



Patellar taping

An adjunct for short-term relief — a physiotherapist shows the technique.

5 Osteoarthritis of the knee — what NICE now says

Older patients with knee pain often have osteoarthritis (OA). The advice has **changed significantly**. NICE guideline **NG226 (2022)** sets out what to do — and what to stop doing.

✓ Core treatment — offer to everyone with OA

Therapeutic exercise (muscle strengthening **and** aerobic exercise) is the core treatment for everyone — it can improve pain, function and quality of life. Add **weight loss** if the person is overweight (even a modest loss helps), plus **education and self-management**.

✓ Medicines — if needed, alongside exercise

- Offer a **topical NSAID first** for knee OA.
- If that is not enough or not suitable, offer an **oral NSAID** at the lowest effective dose for the shortest time — and you **must co-prescribe a PPI** for gastric protection, taking account of cardiovascular, renal and GI risk. (*Doses: see the BNF.*)
- An **intra-articular corticosteroid** injection is an option for short-term relief, or to support exercise.

× Do NOT offer

- **Do NOT offer glucosamine** — no strong evidence of benefit.
- **Chondroitin is not recommended.**
- **Do NOT offer intra-articular hyaluronan** injections.
- Do **not** routinely offer paracetamol or weak opioids; do **not** offer strong opioids.

🔄 What's changed from older teaching

Older notes — including the earlier version of this document — suggested **glucosamine and chondroitin supplements** and focused on **knee taping** for OA of the knee. **NICE NG226 (2022) changed this.** Glucosamine should **not** be offered and chondroitin is not recommended. The focus is now firmly on **exercise and weight management**, with a **topical NSAID** as the first medicine.

The old warning that NSAIDs can be dangerous still holds in spirit — that is exactly why **topical comes first**, oral is used at the **lowest dose for the shortest time**, and a **PPI** is added for protection.

C One-minute memory card

◆ Knee Cases in GP — at a glance

Amanda · 14 · runner

→ PFPS

Michael · 48 ·

downhill

→ PFPS (overload)

Stephanie · 25 ·

“locking”

→ PFPS

Jemima · 14 · both

knees

→ hypermobility*

⊙ **Golden rule 1:** PFPS wears many disguises — same problem, many different stories.

▲ **Golden rule 2:** Pain in both knees → think systemic disease first (**only after excluding it did Jemima's hypermobility fit*).

△ **Red flags first:** hot swollen joint (septic), night/rest pain + weight loss (tumour), can't weight-bear (fracture), true locking (meniscus), many joints + morning stiffness (inflammatory).

▶ **PFPS in one line:** front-of-knee pain, worse on stairs/hills/sitting, near-normal exam → explain, physio (VMO + hip), modify activity, review — refer at 6 weeks.

▶ **OA knee (NG226) in one line:** exercise + weight first → topical NSAID → oral NSAID + PPI. **No glucosamine.**

Sources (verify before use): NICE CKS, *Knee pain — assessment* (2022). NICE NG226, *Osteoarthritis in over 16s: diagnosis and management* (2022). NHS & Ehlers-Danlos Society — joint hypermobility & the Beighton score. BNF — for all drug doses. NICE takes precedence where sources differ.

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