



Managing Patellofemoral Pain in Primary Care

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Disclosures

- I have no relationships to disclose.



Opening Case

Patient Presentation

16-year-old runner with gradual onset anterior knee pain – no trauma, normal radiographs.

- Pain with stairs, squatting, and prolonged sitting
- Insidious onset during training season



Audience Poll

What is the best next step?

- MRI
- Rest
- Corticosteroid injection
- Exercise therapy

Why This Matters

Patellofemoral pain is one of the most common musculoskeletal diagnoses encountered in primary care – and it's frequently undertreated.

11–17%

of Knee Pain in Primary Care

40%

of Sports Knee Complaints

25%

Lifetime Prevalence

29%

Adolescent Prevalence

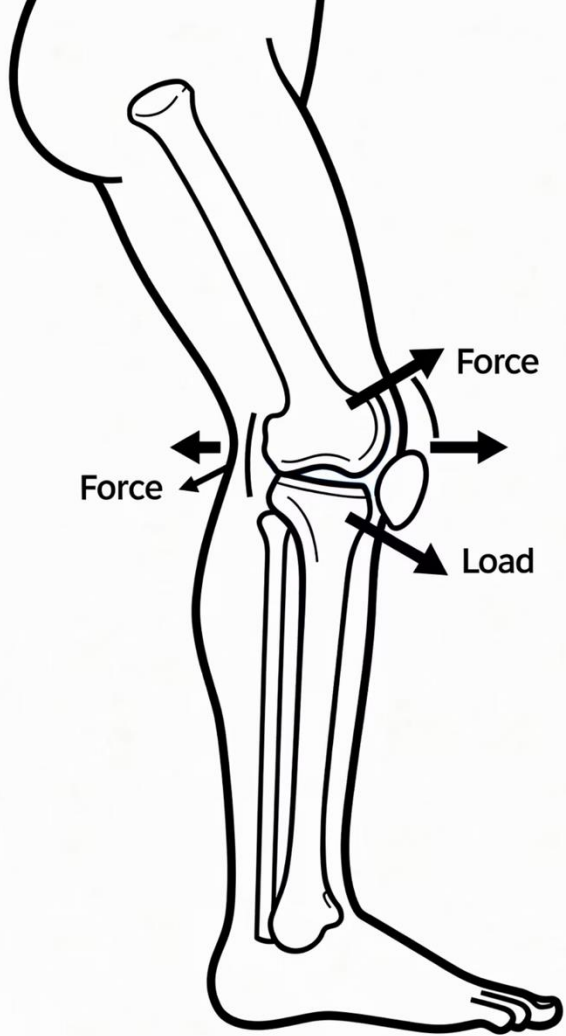
Myth vs. Reality

The Myth

PFP is a benign, self-limited condition that resolves with rest and time.

The Reality

- **57%** report unfavorable recovery at 5–8 years
- Recurrence rates as high as **90%**
- May represent an early continuum toward patellofemoral osteoarthritis



Modern Understanding of PFP

PFP is fundamentally a **load-management problem** – not a structural or degenerative disease.

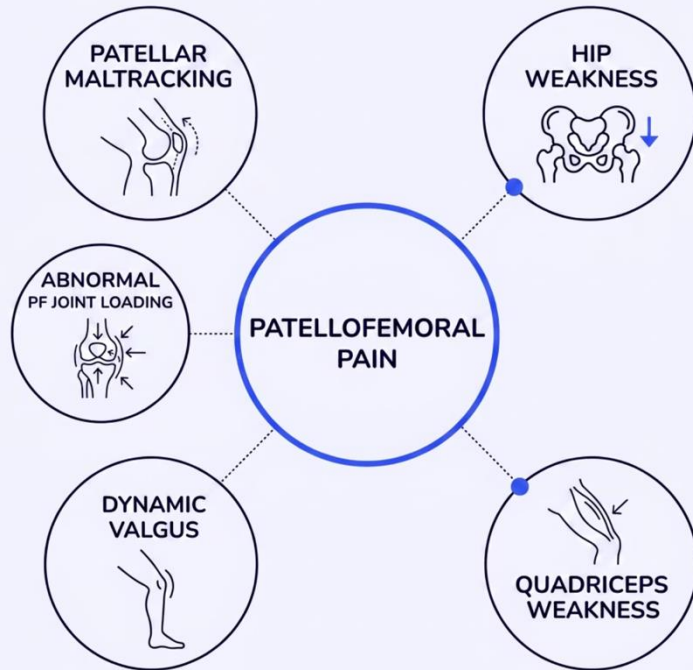
Not This

"Chondromalacia," wear and tear, or MRI abnormalities driving symptoms

But This

Joint load intolerance, movement dysfunction, training errors, and strength deficits

Pathophysiology at a Glance



Clinical Pearl

Pain does not necessarily equal cartilage damage. MRI findings of chondral irregularity are common in asymptomatic individuals and do not dictate treatment decisions.

i Address the **biomechanical drivers** – not the imaging.

What Is Actually Hurting and Why?

The source of pain in PFP is often multifactorial – and while identifying the exact pain generator rarely changes management, it can help guide patient education and set expectations.

Common Pain Generators

- Fat pad impingement – the infrapatellar fat pad is highly innervated and can be pinched with hyperextension or patellar maltracking
- Inferior patella / subchondral bone – increased joint stress leads to bone sensitization
- Proximal patellar tendon – at the patellar insertion, often co-exists with PFP; distinguish from true tendinopathy


Anatomical Risk Factors

Patellofemoral Anatomy

- Trochlear dysplasia – shallow groove = poor patellar containment ("too loose")
- Patella alta – high-riding patella = reduced contact area, increased stress
- Patella baja – low-riding patella = fat pad impingement risk

Soft Tissue Contributors

- Quadriceps weakness – reduced shock absorption, increased joint load
- Quadriceps tightness – increased compressive force on patella
- Tight lateral retinaculum – pulls patella laterally, alters tracking

 **Anatomy loads the gun** – activity and load pull the trigger. Most patients have a combination of structural predisposition and training error.

Risk Factors



Patient Factors

- Female sex
- Prior knee injury
- Quadriceps weakness
- Hip abductor weakness



Training Factors

- Sudden increases in volume or intensity
- Running load errors
- Sport specialization at a young age

Clinical Diagnosis

PFP is a **clinical diagnosis**. Key symptom is pain around or behind the patella, reliably reproduced by activities that load the patellofemoral joint.



Stairs



Squats & Lunges



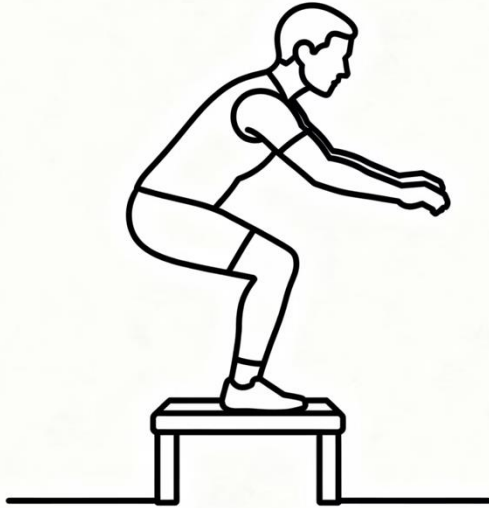
Running



Prolonged Sitting

✔ Pain consistently improves when patellofemoral joint load is reduced.

The Most Important Exam Finding



Squatting Reproduces Pain

A positive squat test is the single most clinically useful maneuver for diagnosing PFP.

Progression of Challenge

1. Double-leg squat
2. Single-leg squat
3. Step-down test

Sensitivity \approx 91%

If squatting does not reproduce symptoms, reconsider the diagnosis.

Physical Examination

Motion and Strength Tests

→ Single-Leg Squat

Key functional assessment; observe for dynamic valgus, pain, crepitus and motion control

→ Hip abductor strength

Resisted abduction testing

→ Patellar mobility

Tilt and glide

Palpation & Provocation Tests

→ Site of tenderness

Often none; may localize to medial patellar facet or infrapatellar fat pad

→ Patellar grind test

Load patella in various directions

→ Patellar inhibition test

Apply downward pressure on superior patella, ask patient to contract quad; positive if pain or patient inhibits contraction

Exclude Other Pathology



- Joint effusion
- Meniscal pathology (McMurray, Thessaly)
- Ligamentous instability (Lachman, valgus/varus stress)
- Tender over IT band; positive Noble compression test

Differential Diagnosis

Several diagnoses may mimic PFP – especially in young, active patients. A focused exam differentiates most effectively.

Patellar Tendinopathy

Pain at inferior pole; worse with jumping

Patellar Instability

Apprehension sign; history of subluxation

Osteochondroses

Tibial tubercle tenderness (Osgood-Schlatter) or inferior patellar pole tenderness (Sinding-Larsen-Johanssen); adolescent athletes

Osteochondral Lesion

Effusion; mechanical symptoms

Plica Syndrome

Medial parapatellar band tenderness

Inflammatory Arthritis

Bilateral symptoms; systemic signs

Imaging: When Is It Warranted?

Radiographs — Obtain When

- History of trauma
- Joint effusion present
- Concern for osteoarthritis or OCD
- Persistent or atypical symptoms

MRI — Reserve For

- Failure after structured rehabilitation
- Mechanical symptoms (locking, catching)
- Suspected osteochondral or cartilage injury



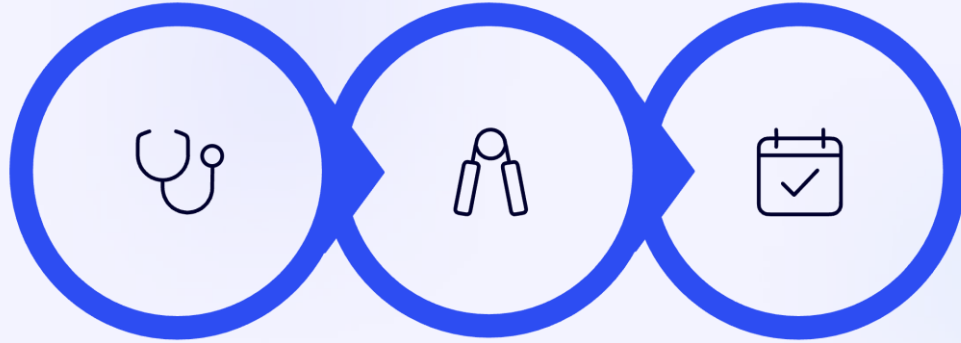
Default Approach

Most patients with classic PFP presentation do **not** require imaging to begin treatment.



Clinical Diagnosis First

History and physical examination are sufficient to initiate an exercise program in straightforward cases.



History & Exam

Start Exercise

Reassess 6–8
wks

MRI Is Usually Not the Answer

The most common mistake in managing PFP is ordering advanced imaging *before* attempting rehabilitation. A structured exercise program should precede – and often replace – the need for MRI.

⚠ Ordering MRI before rehab delays treatment, increases costs, and may lead to unnecessary interventions based on incidental findings.



Evidence-Based Treatment

Three Pillars of PFP Management



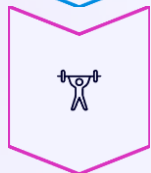
Education

Set realistic expectations; explain the load-management model



Load Management

Modify – don't eliminate – activity to reduce pain spikes



Exercise Therapy

Hip + knee strengthening; the strongest evidence-based intervention

Education Matters

What to Tell Your Patients



Recovery Takes Time

Expect months, not weeks.
Communicate this early to prevent frustration and abandonment of treatment.

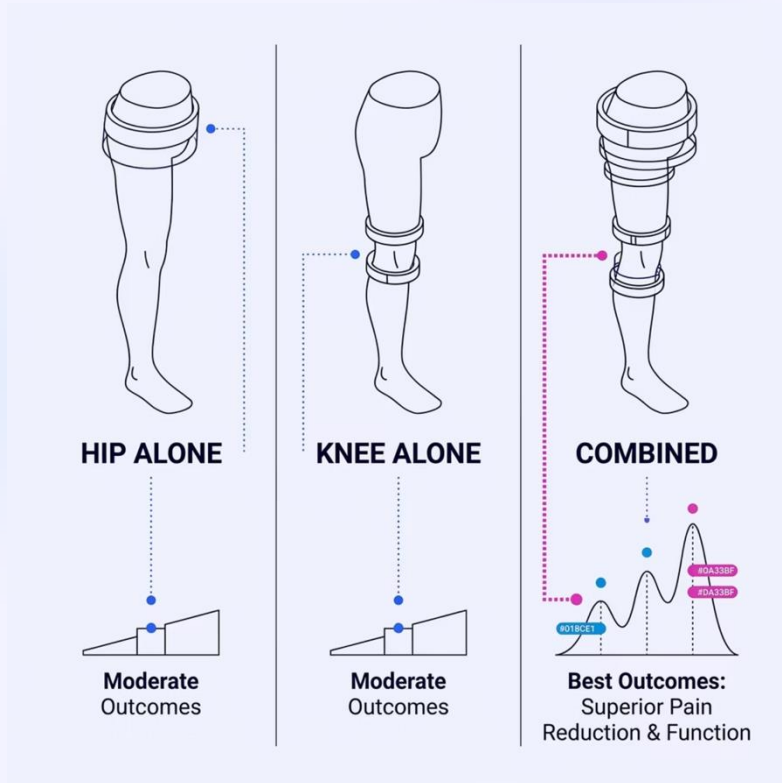
Rest Is Not the Answer

Complete rest leads to deconditioning and delays recovery.
Activity modification is preferred.

Active Participation Is Required

Patient engagement in the exercise program is the primary driver of outcomes.

Exercise Is the Prescription

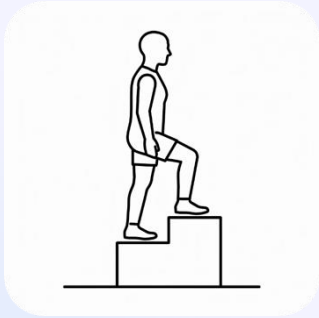


What the Evidence Shows

Combined hip and knee strengthening consistently outperforms either approach alone in reducing pain and improving function.

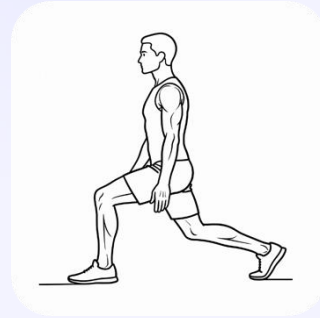
✔ **Bottom line:** Prescribe a combined program. This is your first-line treatment.

Practical Exercise Program



Step-Downs & Single-Leg Squats

Functional closed-chain movements that load the PF joint progressively



Split Squats & Lunges

Improve quad and hip strength simultaneously with unilateral loading



Band Walks & Leg Press

Target hip abductors and external rotators; low-impact loading options



Dosing: High-volume programs performed consistently over 6–12 weeks yield the best outcomes.

Adjuncts That May Help

Several adjunct interventions have supporting evidence – but should *always* be combined with exercise therapy, not used as substitutes.



Patellar Taping

McConnell technique; may provide short-term pain relief to facilitate exercise



Prefabricated Orthoses

Modest evidence for pain reduction; reasonable adjunct in patients with foot pronation



Gait Retraining

Increasing cadence by 5–10% may reduce PF joint stress in runners

What Not to Routinely Recommend

Several commonly used interventions lack sufficient evidence – or have negative evidence – for PFP. Avoid defaulting to these before exhausting exercise therapy.

Knee Braces

No consistent benefit over exercise alone

NMES

Neuromuscular electrical stimulation adds no clear benefit

Dry Needling


Insufficient evidence to recommend routinely

Corticosteroid Injections

Not supported as routine treatment for PFP

Hyaluronic Acid

No evidence of benefit in patellofemoral pain

 **Exercise remains the non-negotiable foundation** of PFP management.

Managing the Running Athlete

Load Management Principles

01

Reduce volume

Cut weekly mileage by 20–30%; avoid abrupt changes

02

Avoid pain spikes

Keep pain $\leq 3/10$ during and after activity

03

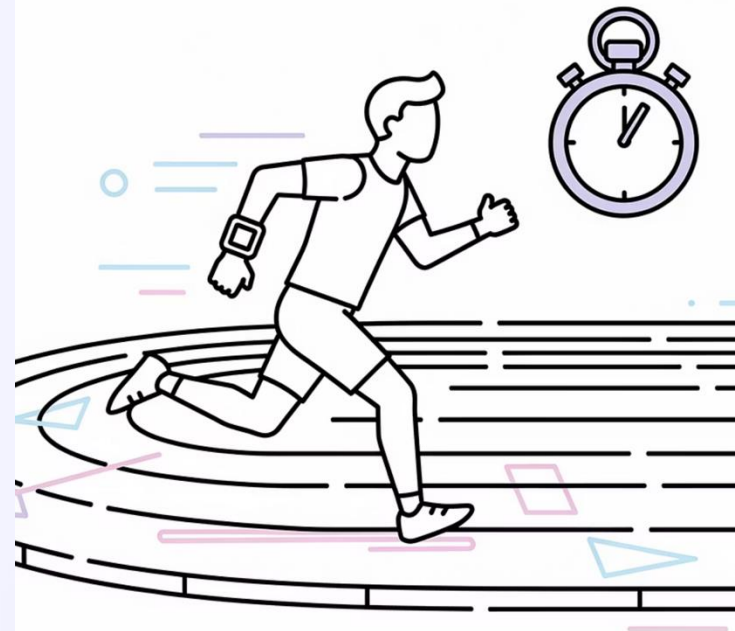
Increase cadence

5–10% increase reduces PF joint stress if gait allows

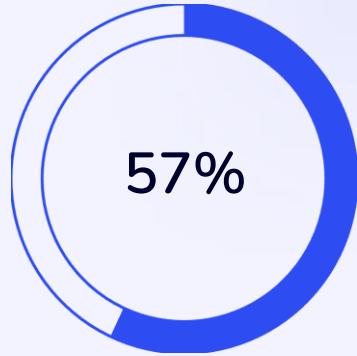
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Gradual return

Increase volume no more than 10% per week once pain-free

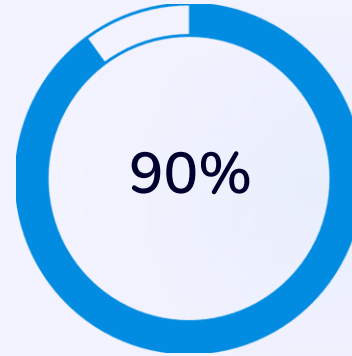


Prognosis



Unfavorable Recovery

At 5–8 year follow-up without structured treatment



Recurrence Rate

Among patients who return to previous training without modification

Prognostic Factors



Poor Prognostic Indicators

- Symptoms present for more than 2 months at diagnosis
- Lower baseline physical function
- High fear-avoidance behaviors



Key message: PFP is manageable – but often persistent without active, sustained treatment.

When to Refer



Referral to Sports Medicine or Orthopedics is appropriate after 6–12 weeks of structured rehabilitation without meaningful improvement, or sooner if red flags are present.



Case Revisited

Our 16-Year-Old Runner

Classic presentation: anterior knee pain with stairs and prolonged sitting, no trauma, normal radiographs.

? What would you do now?



Best Answer

- **Education** – explain load-management model; set realistic expectations
- **Activity modification** – reduce running volume, not complete rest
- **Targeted exercise therapy** – combined hip and knee strengthening program
- **Reassess** at 6–8 weeks; refer if failing

Five Things PCPs Should Remember

1

PFP Is Common

Affects up to 17% of knee pain presentations in primary care

2

PFP Is Not Always Benign

57% unfavorable recovery at 5–8 years without structured treatment

3

Diagnosis Is Clinical

Squatting reproduces pain (sensitivity \approx 91%); no imaging required to start

4

MRI Is Rarely Needed Initially

Reserve for failed rehab, mechanical symptoms, or diagnostic uncertainty

5

Exercise Therapy Works

Combined hip + knee strengthening is the most evidence-based intervention available



Clinical Takeaway

Diagnose clinically → prescribe exercise → manage load → reassess
→ refer if needed

Questions?

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