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# Patellofemoral Pain for Health and Fitness Professionals

with

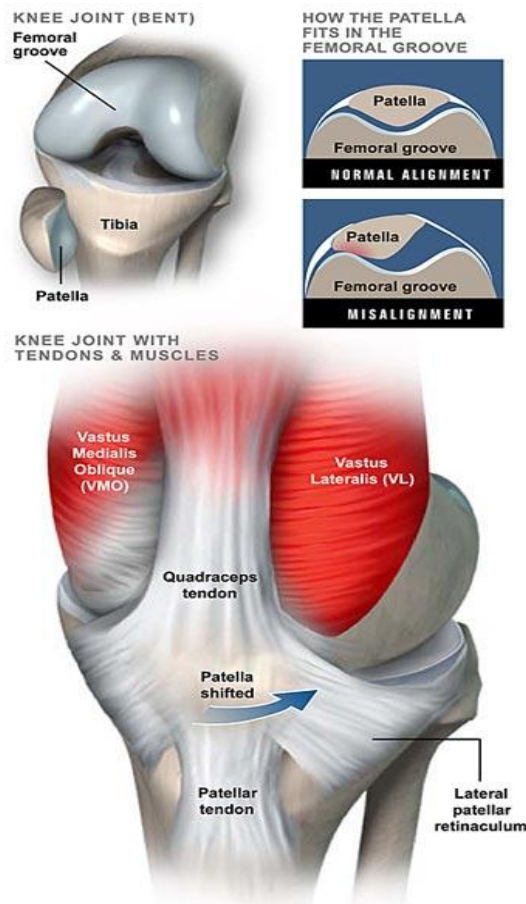
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## What is it?

- Patello-femoral Pain Syndrome (PFPS) is a term used to describe pain at the front (anterior) of the knee which typically comes on gradually with symptoms increasing over a period of time.
- It is sometimes also called anterior knee pain and is extremely common.
- Patello-femoral pain syndrome occurs when the patella does not move or 'track' in a correct fashion. It typically is pulled laterally but can also be tilted or rotated. This dysfunctional movement can lead to damage of the surrounding tissues, such as the cartilage on the underside of the patella itself or the femur's articulating surface, which can lead to pain in the region.
- Symptoms include aching pain in the knee joint, particularly at the front, around and under the patella, tenderness along the border of the kneecap, pain when running, walking up or down hills or stairs, clicking or cracking sound may be present on bending the knee, sitting for long periods may be uncomfortable. Wasting (atrophy) of the quadriceps muscles (particularly VMO) may be present.



## What it is NOT!

- Usually doesn't occur directly from acute injury. i.e twisting the knee will not cause PFJ pain. (exceptions: direct blow or falling directly onto the anterior aspect of the patella and dislocated patella)
- There is not excessive swelling
- Pain does not originate from the joint lines, patella tendon or tibial tuberosity. These are other conditions such as; meniscal tear, cartilage , OA, patella tendinopathy, fat pad impingement, Sinding Larson Johanson syndrome and Osgood Schlatters disease

## What Causes it?

1. **Overloading**
  - Training errors e.g. volume/too much too soon
  - Technique errors e.g. squat
2. **Other knee injury or surgery-**
  - VMO inhibition
3. **Muscle strength imbalance:**
  - VMO vs ITB/VL
  - TFL vs glut medius
  - The resultant force vectors of VMO Dysfunctions can cause the patella to track incorrectly thus causing patellofemoral pain
4. **Over pronating feet**
  - 70% of people overpronate
  - Refer for gaitscan assessment
  - Overpronation causes mal alignment of the lower limb.
  -
5. **Q-angle (structural)**
  - Femoral anteversion/ knock knees
  -
6. **Q angle ( muscular)**
  - i.e. lack of hip stability
  - trendelenburg sign
7. **Tight Muscles:**
  - TFL/ITB/VL

## How can PTs identify clients at risk?

1. **Observation**.....alignment, Q angle, pronation, VMO bulk, hip stability, body weight, pelvic control etc
2. **Trendelenburg Sign**: trainer observes contralateral hip drop with walking, standing on one leg, 1 leg squat or hop.
3. **Thomas Test (hip F, rec fem, TFL/ITB)**: patient/client lies supine with legs hanging off the end of a bed. Client pulls one knee to their chest whilst keeping their lumbar spine in neutral. PT observes hip ankle in frontal plane (Psoas), coronal plane (TFL/ITB) as well as knee ankle (rec fem). Norms are 0 degs hip flexion, 0 degs hip abduction and 90deg knee flexion
4. **Knee to wall test** (ankle rom): maximum distance toes can be from a wall with knee able to touch the wall whilst heel down, knee in line with second toe and without compensatory pronation.
5. **Carter Wilkinson Hypermobility test (score /9)**  
Little fingers extend beyond 90degs L/R = 1 point each  
Thumbs touch forearms L/R = 1 point each  
Elbows hyperextend past 180deg L/R = 1 point each  
Knees hyperextend past 180deg L/R = 1 point each  
Palms to floor in standing  
  
Score/9....1-3 mild hypermobility, 4-5 moderate hypermobility, 6+ marked hypermobility.
6. **History of knee pain/injury**

## Practical: Training modifications and corrective exercises.

Address the above risk factors.

- Training; running volume, stair training, plyometrics, knee loading exercises
- Ensure optimal biomechanics:
  1. exercise technique (equal hip /knee loading, alignment)
  2. running mechanics ( hip knee stability (see below), overpronation (footwear /orthotics)
  3. Address tight muscles (see below)

### Stretches...if positive on Thomas testing

TFL:

Foam roller:

Rec fem:

### Example Exercise Progressions....focus on hip stabilizers if positive trendelenburg and focus on VMO if atrophy or loss of tone id present.

Level 1:

- VMO activation with towel
- Clamshells +/- TB
- Bridging

Level 2:

- Theraband squat
- Closed chain leg press
- Ball wall squat
- Hip Hitch

Level 3:

- Stationary lunge...progress to step back
- Bulgarian split squat

Level 4:

- 1 leg squat
- 1 leg ball wall squat
- Step up
- Travelling lunge

Level 5:

Resume dynamic activities...running, plyometrics etc

### **5 take home tips....**

- 1. Never perform/prescribe an exercise that causes anterior knee pain. You must alter the exercise/reduce the range or reduce the weight so that it is pain free.**
- 2. Make sure the knee is in line with the second toe and the hips are equal height at all times during the movement.**
- 3. Ensure correct hip knee loading i.e. Shin(s) parallel with back**
- 4. Unilateral leg exercises are better than bilateral leg exercises**
- 5. If you are unable to prescribe exercises which do not hurt or pain continues...refer to a Physiotherapist for a complete assessment.**

