Patellar-Femoral Protocol
Rick Hammesfahr, MD

Possible causes of PFP:

1. Abnormal patellar tracking and / or malalignment
2. Weak VMO
3. Decreased flexibility of hamstrings, quadriceps, and IT band
4. Femoral anteversion (detectable if squinting of the patella)
5. Prolonged / excessive foot pronation in WB activities
6. Increased Q-angle

Research Evidence:

1. A lack of sufficient proximal muscle strength such as in the hip abductors and external rotators can NOT resist adduction and internal rotation moments occurring at the knee. As a result, the femur excessively adducts and internally rotates, increasing lateral retropatellar contact pressure.
2. Prolonged foot pronation during gait may cause the tibia to internally rotate which further causes the femur to compensate by also internally rotating to the extent that the tibia becomes relative externally rotated. This compensation creates an increased Q-angle, which increases lateral retropatellar contact pressure.

What to examine:

1. Isometric strength of pelvic musculature including hip abductors and hip external rotators.
2. LE alignment in standing posture and in dynamic movements such as gait and stair descent. (Look to see if the femur is abducted and internally rotated.
3. Strength of abdominal and spinal musculature. (Importance in controlling pelvic and hip motion during dynamic activities.) Example: Patient tries to maintain static bridge position against a manual rotational force applied to the pelvis in the transverse plane.
4. Evaluate the patient moving from double to single-limb stance. Note any signs of pelvic drop, indicating weakness in gluteus medius.
5. Limb length differences.

Treatment Focus: Address muscle weakness and neuromuscular control in the trunk, hip and pelvis in order to improve gait kinematics and reducing PFP. **Stretch tight lateral structures with medial patellar glides / mobs and ITB stretching.**

Intervention Program:

Duration: 3 months
Frequency 3 times per week
Reps: 10-15 (if patient not fatigued after 10-15 reps, then increase load)
Sets: 2-3 Hold: 10 seconds isometrically

A. Establish neutral pelvis in supine using a pressure cuff for feedback. Progress with alternating active hip and knee flexion / extension and / or arm movements.

(Note: A stable pelvis provides stable attachments sites for muscles which promotes a greater

torque production.)

B. Progressively strengthen LE musculature (i.e. gluteus maximus, gluteus medius, hip abductors lateral rotators, VMO)

1. **1st NWB positions**
   a. **Supine:** Leg abduction without resistance. **Short Arc quads 0 -30 degrees (pain free)** (progress with adding resistance.)
   b. **Sidelying:** Clams with short lever arm. (Progress with long lever arm before adding weights.) Wall slides. (Progress with adding resistance.)
   c. **Prone:** Hip extension with knee flexed >90 degrees (Progress with adding resistance.)
   d. **Quadraped:** Perform external rotation, abduction and extension motions of the LE. (Progress from short to long lever arm.)

2. **2nd WB positions**
   a. SLS against wall: Maintain alignment of ASIS and knee over 2nd toe with hip in 10 degrees of external rotation. Stance limb is furthest from wall; contract transverses abdominus and gluteal muscles; flex the contralateral knee; isometric external rotation by pushing knee into wall.
   b. SLS plus carrying load in contralateral arm.
   c. SLS plus ball throws, alternating bicep curls, rowing exercises, trunk rotations. (Progress with T-band resistance from medial thigh).

(Note: The Patient can self monitor by palpating the ASIS for movement using the free hand.)

3. **3rd Functional Training**
   a. Leg press with knee flexion <45 degrees (Progress from double to single leg squat, then progress with T-band pulling on medial thigh to recruit hip abductors and external rotators.)
   b. Shallow lunges between 0-45 degrees of knee flexion. (Progress with T-band pulling on medial thigh.)
   c. Progress with walking / running program if the patient completes the above tasks pain free and symptom free.

For all of the above exercises progress by increasing the resistance only when the patient is able maintain neutral spinal position with minimal verbal cueing during a 10 second isometric muscle contraction for 2 sets of 15 repetitions. Progress further by including complex coordinated motor patterns involving more functional activities. Example: ascending / descending stairs, SLS with ball tossing, and / or SLS with squats.

Conclusion: Research has shown that patient's c/o PFP responded favorably to programs designed to strengthen trunk, pelvis, and hip musculature while continuing to use complimentary treatment strategies such as McConnell taping, VMO strengthening, and stretching regimes.