

Physical Therapy Protocol: Nonsurgical Treatment of Patellofemoral Pain

Phase 1: Weeks 0 through 2 – Pain and Inflammation Reduction

Physician Goals: Reduce any swelling, minimize pain; restore patellar mobility, lower extremity flexibility (including hip and ankle); restore tolerance to full motion; minimize arthrogenic muscle inhibition and re-establish quadriceps, hip control

Exercises: Stretching tight regions – hip flexors, quads, hamstrings, adductors, IT band; pain free isometric quad contractions; hip abductor and external rotation activation with side-lying clams, glute bridges, etc; stationary bike with little to no resistance; core strengthening – planks, side lying planks, etc

Comments: Educate the patient on the importance of minimizing aggravating factors as much as possible during this early phase of PT such as descending stairs, prolonged sitting, deep squats, running, jumping.

Total Visits: 4 – Once to twice per week with daily home stretching, hip and knee strengthening 3-4x per week including PT

Phase 2: Weeks 2 through 6 – Strength and Control

Physician Goals: Restore hip, knee, and core strength, improve neuromuscular control of the lower extremity, begin functional loading

Exercises: Increased quad strengthening – closed chain exercises, short arc squats (pain free range and load), step ups to tolerance; continue hip strengthening; continue core stabilization; functional movement re-training with single leg short arc squats, lunges, step downs with proper form (minimize valgus or hip internal rotation); continue flexibility work and foam rolling for tight tissues; gradually re-introduce low-impact aerobic work to tolerance (elliptical, exercise bike with low resistance, swimming)

Comments: Patients should see weekly improvements in terms of what they are capable of doing with tolerable symptoms, utilize NSAIDs and ice as needed

Total Visits: 8 – One to two times per week with daily home stretching, strengthening portion of HEP 3-4x per week including PT

Phase 3: Weeks 6 through 12+ – Return to Sports and Recreation

Physician Goals: Gradually resume all activities, including sports and recreational hobbies while keeping symptoms tolerable and avoiding recurrence of severe symptoms

Exercises: Continue passive stretching as needed, increase quad strengthening exercises as tolerable (continue to limit squats to 90° of knee flexion and emphasize importance of proper form with lunges), eccentric loading through the extensor mechanism, begin plyometric exercises, sport-specific training including jumping and cutting; increase endurance first and then maximum strengths, prone on toes, decline)

Comments: Goal of PT is to regain strength needed to perform all ADLs and recreational activities without pain, transition to HEP when ready; emphasize importance of regular HEP including both stretching and strengthening to minimize risk of recurrence, return to running, cutting, sports per criteria below

Total Visits: 12 – One to two times per week with daily home stretching, strengthening portion of HEP 3-4x per week including PT

Return to Running Criteria:

- Trace effusion, flexion within 5° of contralateral side
- Limb symmetric index (LSI) on anterior reach Y balance test $\geq 90\%$
- LSI on quadriceps torque output on isometric measurement $\geq 75\%$
- 12" single leg squat tolerance with good hip control
- Able to walk > 1 mile with no limping or pain
- Able to "hop" with upper extremity assistance on operative leg 5 times without pain or compensation
- Single leg balance with eyes closed ≥ 30 seconds

Return to Cutting / Agility Training Criteria:

- Return to running criteria met above
- No effusion
- Full range of motion
- Quad LSI on isokinetic $\geq 85\%$
- Hamstring LSI on isokinetic $\geq 85\%$
- LSI on anterior reach Y-balance $\geq 95\%$
- Single leg hopping pain free

Return to Sport Criteria:

- LSI $\geq 95\%$ hamstring curl and leg press
- Able to perform single leg squat to 75° with correct form
- Single leg hop LSI $\geq 95\%$
- Y-balance $\geq 95\%$ (mean of 3 trials in anterior, posterolateral and posteromedial $\div 100$)
- Vertical jump test, single leg hop distance, and timed single leg hop over 20 feet $\geq 90\%$ contralateral side