Megan R. Wolf, MD
Sports Medicine/Foot & Ankle

www.meganwolfmd.com

Adapted from: Kathy Coyner, MD
www.DrCoyner.com

PATELLOFEMORAL REHABILITATION PROTOCOL

REHABILITATION PROGRESSION:

The following is a general guideline for progression of the rehabilitation program. Progression through each phase should take into consideration patient status (e.g. function) and physician advisement. Please consult the attending physician if there is uncertainty regarding the advancement of a patient to the next phase of rehabilitation.

PHASE I:

1-4 weeks.

Goals:

- Control any inflammatory process
- Regain active quadriceps and VMO control
- Stretch iliotibial band, lateral retinaculum

Therapeutic Exercises:

- Quad sets and isometric adduction with biofeedback for VMO
- Gastrocnemius/soleus, hamstring stretches
- Resisted ankle ROM with Theraband
- Patellar mobilization

PHASE II:

4-10 weeks.
Criteria for advancement to Phase II:

- Full active extension/hyperextension
- Minimal swelling/inflammation
- Normal gait on level surfaces

Goals:

- Restore normal gait with stair climbing
- Maintain full extension, progress toward full flexion range of motion
- **Increase hamstring, quad, IT band, gastroc/soleus flexibility**
- Increase hip, quadriceps, hamstring and calf strength
- Increase proprioception

Exercises:

- Continue with knee range of motion/flexibility exercises as appropriate
  - **Continue quad, hamstring, IT band, gastroc/soleus stretches**
- Continue to progress hip, quad, hamstring and calf strengthening
  - Continue **closed kinetic chain** strengthening as above, progressing as tolerated – can include BAPS, half-squats, one-leg squats, leg press, step ups at increased height (begin at 2" and progress towards 8"), partial lunges, deeper wall sits, leg press (0-45° of flexion)
- Core strengthening
- Continue to progress proprioceptive/balance activities – ball toss, balance beam, mini-trampoline balance; emphasize hip and knee flexion, avoid valgus moment at the knee in single-leg stance
- Conditioning
  - Nordic Track, stationary bike, elliptical machine
    - Stationary biking- progress time and resistance as tolerated; progress to single leg biking
    - Begin running in the pool (waist deep) or on an un-weighted treadmill at 6-8 weeks
- Treadmill walking with emphasis on normalization of gait

PHASE III:

Begins at approximately 10 weeks and extends through approximately 16 weeks.
Criteria to advance to Phase III include:

- No patellofemoral or tendon pain
- Sufficient strength and proprioception to initiate running.
- Minimal swelling/inflammation

Goals:

- Full range of motion
- **Increase hamstring, quad, IT band, gastroc/soleus flexibility**
- Improve strength, endurance and proprioception of the lower extremity to prepare for sport activities
- **Strength approximately 70% of the uninvolved lower extremity per isokinetic evaluation**
- Protect the patellofemoral joint
- Normal running mechanics

Exercises:

- Continue quad, hamstring, IT band, gastroc/soleus **flexibility** and knee ROM exercises
- Progressive hip, quadriceps, hamstring, calf strengthening
- Toe raises
  - Hamstring curls
  - **Knee extensions 90°-30°, progress to eccentrics.** Leg press 0-70° of flexion.
  - 4 way hip flexion, adduction, abduction, extension
  - **Isokinetic quad and hamstring strengthening (with anti-shear device) – begin with mid range speeds (120^{o}/sec- 240^{o}/sec)**
    - **Recommend isokinetic test with anti-shear device at 12 weeks to guide continued strengthening.**
- Cardiovascular/endurance training via swimming, water running, elliptical, bike
  - Stationary bike, add moderate resistance
  - Progress toward full weightbearing running at 12 weeks.
- Advance proprioceptive activities

PHASE IV:
Begins at approximately 4 months and extends through approximately 6 months.

Criteria for advancement to Phase IV:
- No significant swelling/inflammation.
- Full, pain-free ROM
- No evidence of patellofemoral joint irritation
- **Strength approximately 70% of uninvolved lower extremity per isokinetic evaluation**
- Sufficient strength and proprioception to initiate agility activities
- Normal running gait

Goals:
- Symmetric performance of basic and sport specific agility drills
- Single hop and 3-hop tests 85% of uninvolved lower extremity
- Quadriceps and hamstring strength at least **85%** of uninvolved lower extremity per isokinetic strength test [or **85%** strength (torque) compared with athletes of same age]

Exercises:
- Continue and progress flexibility and strengthening program based on individual needs and deficits.
- Agility progression including, but not limited to:
  - Side steps
  - Crossovers
  - Figure 8 running
  - Shuttle running
  - One leg and two leg jumping
  - Cutting
  - Acceleration/deceleration/sprints
  - Agility ladder drills
- Continue progression of running distance based on patient needs.
- Initiate sport-specific drills as appropriate for patient
- Initiate plyometric program as appropriate for patient's athletic goals

PHASE V:
Begins at approximately 6 months post-op. Criteria for advancement to Phase V:

- No patellofemoral or soft tissue complaint
- Necessary joint ROM, strength, endurance, and proprioception to safely return to work or athletics

Goals:
- Safe return to athletics/work
- Maintenance of strength, endurance, proprioception
- Patient education with regards to any possible limitations

Exercises:
- Gradual return to sports participation
- Maintenance program for strength, endurance