



## Quadriceps Tendon Repair Physical Therapy Protocol

**General Guidelines:** The included protocol is intended to be a guideline for the therapist in assisting the patient having undergone a quadriceps/patella tendon repair. The overall speed of progression is determined by the therapist upon achieving the designated goals. Determined length of therapy is 2-3 times weekly for 4-8 weeks with emphasis on a home exercise program. Modalities may be used as needed.

### **Rehabilitation Protocol**

#### **Phase 1: 0-2 weeks postop**

**Goals:** Control pain, diminish swelling, begin regaining knee range of motion with focus on full extension, patella mobility, protect the tendon repair

**Weight bearing:** weight bearing as tolerated in hinged knee brace locked in extension

**Brace:** hinged knee brace locked in extension for ambulation and sleep. The initial settings will be determined by the condition of the repair postop (usually between 30-60° of flexion) and can be unlocked in the determined settings during supervised therapy.

#### **Exercises:**

- Patella mobilization (medial and lateral)
- Ankle pumps
- Straight leg raises to 45° with brace locked in extension
- Hip adduction, abduction, extension
- Knee Extension: Heel prop, Prone leg hang
- Knee Flexion: prone hamstring curls. AVOID active extension for 6 weeks)

#### **Phase 2: 2-6 weeks postop**

**Goals:** Control pain, advance range of motion, develop muscular control, achieve normal gait, protect the tendon repair

Weight bearing: as tolerated in hinged knee brace locked in extension. Progression to wean to single crutch.

Brace: Advancement criteria assuming previous motion achieved without significant pain.

Advance settings beginning:

- Week 2: no change
- Week 3: +20°
- Week 4: +40°
- Week 5: +60°
- Week 6: full open as tolerated

Exercises: (with above knee brace settings)

- Continue Phase 1
- Quad sets with leg in extension
- Knee flexion (with above brace parameters): may begin active-assisted heel slides. Continue prone hamstring curls.
- Heel/toe raises
- Proprioception: single leg balance, balance board, BOSU trainer
- Stationary cycling (as tolerated in above brace parameters)—increase resistance as tolerated
- Avoid open chain knee extension/curls machine

### **Phase 3: 6-12 weeks postop**

Goals: Regain full range of motion, enhance leg muscular strength and endurance, improve proprioception and neuromuscular control, restore normal gait, return to functional activities

Weight bearing: as tolerated. Wean off crutch.

Brace: Continue use of brace until 3 months. May unlock brace for ambulation once able to achieve straight leg raise without any extensor lag

Exercises:

- Continue Phase 1 and 2/lower extremity strengthening
- Knee flexion: begin wall slides, assisted knee flexion with contralateral leg, seated assisted knee flexion
- Short arc straight leg raise with brace unlocked
- Active assist eccentric knee extension exercises
- Standing mini squats (avoid knee flexion > 45°)
- Cardiovascular: elliptical, stationary bike, treadmill walking (no jogging/running until 3 months).
- Improve proprioception/neuromuscular control

### **Phase 4: 3-4 months postop**

Goals: Maintain full range of motion, increase leg strength and endurance, achieve normal running gait

Brace: May discontinue once able to maintain a straight leg raise without any extensor lag for > 10 sec

Precautions: avoid deep squats, deep knee bends/lunges, active leg extension machines/stair climber machines

Exercises:

- Continue Phase 3 exercises
- Front/lateral step-ups
- Seated leg press (avoid knee flexion > 45°)
- Wall squats
- Resisted hamstring curls
- Continue daily flexibility/stretching
- Improve proprioception/balance/coordination: single leg balance, backward walking, wobble board, BOSU trainer
- Aquatic exercise: pool walking, straight-leg flutter kicks, water bicycle
- Initiate running progression protocol: light jogging → jogging → running on level track surface/treadmill → running on level pavement at 4 months
- Avoid hiking/running on uneven surfaces

**Phase 5: 4-6 months postop**

Goals: Maintain full pain-free range of motion, strength > 80% of contralateral leg, normal running gait, sufficient proprioception/neuromuscular control to begin agility exercises, return to skill activities and sport participation

Exercises:

- Front/lateral lunges
- May introduce stair climber
- Single leg squats
- Straight-ahead running on level surfaces (no trail running until 5 months)
- May begin outdoor cycling
- At 5 months: Agility drills: side steps, figure of eight drills, stair running, shuttle running, ladder drills, straight ahead acceleration/deceleration
- Begin plyometric drills, two-leg and single-leg jumping. May introduce sport-specific drills
- At 6 months: Safe return to athletic participation
  - Full pain-free range of motion, quad/hamstring strength >80% of contralateral leg, satisfactory single-leg hop >80% contralateral leg
  - Physician clearance examination prior to return to full sport participation
- Maintenance program for continued knee strength and endurance