

# **ACL RECONSTRUCTION – PATELLAR TENDON**

**Dr Elrashidy – Webster Orthopedics**

## **OVERVIEW**

- Focus on protection of graft and fixation in early phases (Weeks 0-4)
- For ACL reconstruction with meniscal repair, defer to precautions in meniscal repair protocol.
- Physician may alter time frames of brace-wear and use of crutches
- Supervised Physical Therapy for 4-6 months

## **GENERAL GUIDELINES**

- Ok to shower on post-op day 3. **NO bathing/soaking knee** until cleared by physician
- Sleep with brace locked in extension x 1 week
- **Brace guidelines:** Locked in extension for 1<sup>st</sup> week (when walking, sleeping). After Week 1, as quad function improves, begin unlocking brace. Goal: 90° flexion by end of Week 2 (should have full extension, able to SLR with solid, isometric quad contraction. Discontinue brace after Week 4
- Crutches: Weight-bearing as tolerated. Wean crutches by end of Week 1/mid-week 2

## **PHASE 1: Post-Op Through Week 4**

### **Goals:**

- Protect graft and graft fixation with use of brace and specific exercises
- Minimize effects of immobilization
- Control inflammation and swelling (cryocuff/ice machine for first 2 weeks)
- Full extension to 90° of flexion
- Restore normal gait on level surfaces

### **Brace (Total Length = 4 weeks):**

- **Week 1: Brace locked in full extension for ambulation and sleeping**
- **Weeks 2-4:** Unlock brace (goal of 90° of flexion by Week 2) as quad function returns. Ok to d/c brace when sleeping after first post-op visit (Day 10-14)
- **After Week 4:** Wean from brace after Week 4, as patient demonstrates normal gait mechanics and good quad control (no quad lag)

### **Weight-Bearing:**

- Week 1: Weight-bearing as tolerated with crutches and brace
- Wean from crutches by 2 weeks and brace by 4 weeks as patient demonstrates normal gait mechanics and good quad control (defined as lack of quad lag)

### **Exercises:**

- Patellar/scar mobilization
- Week 1: Maintain extension (see below). Increase flexion as tolerated (0-90° by end of Week 2)

## ACL BTB PROTOCOL

### A. Extension (straightening knee)



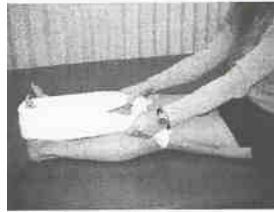
Lie on your stomach with your knee and lower leg hanging over the edge of the bed to stretch your knee straight. Hold 5-10 minutes, 4-5 times per day.

and



Lie on the bed with your ankle on a pillow. Let your knee relax down to stretch your knee straight. Avoid tightening your thigh muscle. Hold 5-10 minutes, 4-5 times per day.

### B. Flexion (bending knee)



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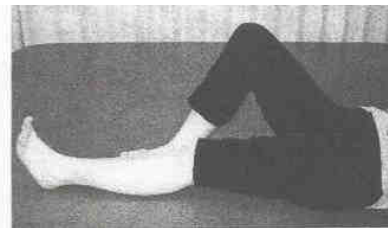
Lie on your bed with a loop of towel under your foot. Bend your knee **no more than 90 degrees** by sliding your heel toward your buttocks. Sustain the stretch for 3-5 seconds. Do 25 reps 4-5 times per day.



**Flexion:** Knee bending can also be accomplished by sitting in a chair. Slide your foot backwards with the help of your other foot. **Stretch no further than 90 degrees** Hold 10 seconds. Repeat 25 times 4-5 times daily

- Heel slides
- Quad sets AND Hamstring curls

**D. Quad Sets:** When you are able to stretch your knee completely straight you can do this exercise. With your knee completely straight, tighten your front thigh muscle (quad). Hold for 3-5 seconds, repeat 10-20 times, 4-5 times per day.



- Gastroc/Soleus stretching and strengthening
- Quad isometrics as 60° and 90°

**VMO Isometrics:** Sit with your knee with at least 70 degrees of bend in it. Squeeze a small ball or rolled towel between your knees while pushing your feet into the floor. Hold 5-10 seconds and repeat 10 times, 1-2 times daily.



- SLR all planes: Brace on in full extension until quad strength sufficient to prevent extension lag. Add weight as tolerated to hip abduction, adduction and extension.

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**Straight Leg Raise – Brace On** When you are able to stretch your knee completely straight you can do this exercise: With your knee completely straight and the brace on and with your other knee bent, lift the operated leg up as high as your other knee. Hold for 2-3 seconds, repeat 10-20 times, 4-5 times per day.

## Hip Workout:

**Extension** Secure a loop of theraband in a door. Stand in the brace with the band around your ankle. Extend your leg backwards. Follow strength progression as above. Repeat with opposite leg.



## Hip Workout: Abduction:

Secure a loop of theraband in a door. Stand in the brace with the band around your ankle. Lift your leg out to the side. Follow strength progression as above. Repeat with opposite leg.



## Hip Workout: Adduction:

Secure a loop of theraband in a door. Stand in the brace with the band around your ankle. Pull band across your body by crossing your leg. Follow strength progression as above. Repeat with opposite leg.



- Closed Kinetic Chain quad strengthening activities as tolerated (Wall sit, Step-up)
- If available, after 2 weeks, add aquatic therapy (once sutures removed) to normalize gait, WB, and strength. Deep-water aqua-jogging for ROM and swelling.
- Stationary biking: Progress time and resistance

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## ACL BTB PROTOCOL

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### **PHASE 2: Weeks 5-10**

#### **Criteria for advancing to Phase 2:**

- Full Extension and Flexion to 90°
- Good quad set, SLR without extensor lag
- Minimal swelling/inflammation
- Normal gait on level surfaces

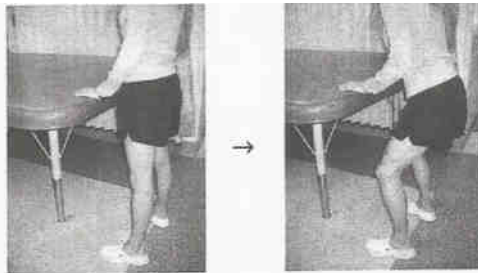
#### **Goals:**

- Restore normal gait with stair climbing
- Maintain full extension, progress towards full flexion
- Increase hip, quadriceps, and calf strength
- Increase proprioception

#### **Exercises:**

- Continue with range of motion/flexibility exercises as appropriate
- Initiate CKC quad strengthening, progress as tolerated. Begin mini-squats (to 45°) and leg press (to 90°)
- **Loading not to exceed body weight until 6 weeks post-op**

**Mini Squats:** Stand with your feet shoulder width apart while holding onto a table or countertop. Bend your knees until your knees are directly over your toes. Hold 5 seconds then return to the starting position. Follow strength progression as above. **Optional:** Can also squeeze a ball between your knees while squatting. Make sure knees are kept over toes.



- Step-ups at increased height, wall sits and partial lunges (Week 6)

**THIS (Partial):**



**NOT (Full):**



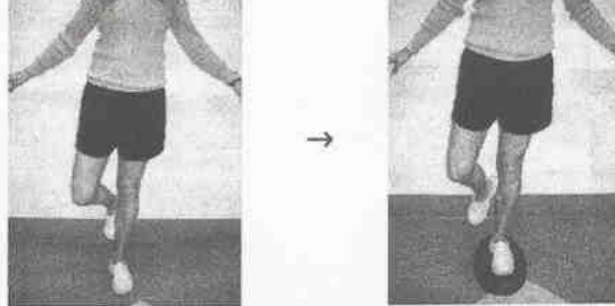
- Progressive hip, hamstring and calf strengthening as well as hamstring, gastric/soleus stretching
- Stairmaster (begin with short steps, avoid hyperextension)
- Nordic Trac, Elliptical for conditioning
- Stationary Bike (progressive time and resistance). Progress to single leg biking

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- Begin proprioceptive training such as single leg balance/proprioception (ball toss, balance beam, mini-tramp)

**Single Leg Balance – Brace Off:** Start on level floor then progress to standing on a pillow. Progress from using your arms for support to no arm use. Try with eyes open then progress to eyes closed if you have good control and are safe.



- If available, pool-running (waist deep) or on unweighted treadmill @ 8-10 weeks

## **PHASE 3: Weeks 13 To 18**

### **Criteria for advancing to Phase 3:**

- No patellofemoral pain
- Minimum of 120° of flexion
- Sufficient strength + proprioception to initiate running
- Minimal swelling/inflammation

### **Goals:**

- Full range of motion
- Improve strength, endurance + proprioception of extremity to prepare for sports
- Avoid overstressing graft, protect the patellofemoral joint
- Normalize running mechanics
- Strength 70% of uninvolved lower extremity per isokinetic evaluation

### **Exercises:**

- Continue flexibility and ROM exercises as appropriate for patient
- **OPTIONAL:** Knee extensions from 90° - 45° and progress to eccentrics
- **\*\* (After 12 weeks, with 75% strength on leg press and HS Curl)**
- FULL Forward Lunges
- Progress toward full weight-bearing treadmill running at about 12 weeks
  - 25% to 50% effort to start
  - Progress to ¼ to ½ mile per week, straight course
- Begin swimming if desired
- Isokinetic test with anti-shear device @12 weeks to guide strengthening
- Progressive hip, quad, hamstring, calf strengthening
- Cardiovascular/endurance training via stairmaster, elliptical, bike
- Advance proprioceptive activities and agility drills



### **PHASE 4: Month 5 Through Month 6**

Criteria for advancing to Phase 4:

- No significant swelling or inflammation
- Full, pain-free ROM
- No evidence of patellofemoral joint irritation
- Strength 70% of uninjured 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 three hop tests 85% of uninjured leg
- Quadriceps and hamstring strength at least 85% of uninjured lower extremity per isokinetic strength test

#### **Exercises:**

- Continue and progress flexibility and strengthening program based on individual needs and deficits
- Initiate plyometric program as appropriate for patient's athletic goals
- **Agility** progression including, but not limited to:
  - Side steps and Crossovers
  - Figure 8 and shuttle running
  - 1 and 2-leg jumping, cutting, acceleration/deceleration, agility and ladder drills
- Continue progression of running distance based on patient needs
- Initiate sport-specific drills as appropriate for patient

### **Phase 5: Post-op Months 6-7 = RETURN TO SPORT**

#### **➤ DRIVING:**

- **1 week** for automatic cars and **left leg surgery**
- **2-4 weeks** for manual cars or **right leg surgery**

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