



# ACL Hamstring Autograft Reconstruction Rehab

## **PHASE I: Immediately post-operatively to week 4**

### **Goals:**

- Protect graft and graft fixation with use of brace and specific exercises
- Minimize effects of immobilization
- Control inflammation and swelling
- Full active and passive extension/hyperextension range of motion. Caution: avoid hyperextension greater than 10°
- Educate patient on rehabilitation progression
- Flexion to 90° only in order to protect graft fixation
- Restore normal gait on level surfaces

### **Brace:**

- 0-1 week- post-op brace locked in full extension for ambulation and sleeping
- 1-3 weeks- unlock brace (<90°) as quad control allows
- 3-4 weeks- wean from brace as patient demonstrates good quad control and normal gait mechanics
- 4-8 weeks- patient should only use brace in vulnerable situations (e.g. crowds, uneven terrain, etc)

### **Weight bearing Status:**

- 0-1 week- partial weight bearing with two crutches to assist with balance
- 1-4 weeks- partial weight bearing progressing to full weight bearing with normal gait mechanics
- Wean from crutches/brace for ambulation by 4 weeks as patient demonstrates normal gait mechanics and good quad control as defined as lack of quadriceps lag

### **Exercises:**

- Active-assisted leg curls 0-1 week. Progress to active as tolerated after 1 week. Delay strengthening for 12 weeks.
  - Heel slides (limit to 90°)
  - Quad sets (consider NMES for poor quad sets)
  - Gastroc/Soleus stretching
  - Very gentle hamstring stretching at 1 week
  - SLR, all planes, with brace in full extension until quadriceps strength is sufficient to prevent extension lag- add weight as tolerated to hip abduction, adduction and extension.
  - Quadriceps isometrics at 60° and 90°
- If available, aquatic therapy (one week after sutures removed) for normalizing gait, weight bearing strengthening, deep-water aqua jogging for ROM and swelling



## **PHASE II: Post-operative weeks 4 to 12**

### **Criteria for advancement to Phase II:**

- Full extension/hyperextension
- Good quad set, SLR without extension lag
- Flexion to 90°
- 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
- Protect graft and graft fixation
- Increase hip, quadriceps, and calf strength
- Increase proprioception

### **Brace/Weight bearing Status:**

- If necessary, continue to wean from crutches and brace.

### **Exercises:**

- Continue with range of motion/flexibility exercises as appropriate for the patient
- Initiate CKC quad strengthening and progress as tolerated (wall sits, step-ups, mini-squats, Leg Press 90°-30°)
- Progressive hip, hamstring, calf strengthening (gradually add resistance to open chain hamstring exercises at week 12)
- Continue hamstring, Gastroc/Soleus stretches
- Stairmaster (begin with short steps, avoid hyperextension)
- Nordic Trac, Elliptical machine for conditioning
- Stationary Biking (progressive time and resistance)
- Single leg balance/proprioception work (ball toss, balance beam, mini-tramp balance work)
- If available, begin running in the pool (waist deep) or on an un-weighted treadmill at 10-12 weeks

## **Phase III: Post-operative weeks 12 to 18-20 (4 1/2-5 months)**

### **Criteria to advance to Phase III include:**

- No patellofemoral pain
- Minimum of 120° of flexion
- Sufficient strength and proprioception to initiate running (un-weighted or in pool)
- Minimal swelling/inflammation

**Goals:**

- Full range of motion
- Improve strength, endurance, and proprioception of the lower extremity to prepare for sport activities
- Avoid overstressing the graft. Progressively increase resistance for hamstring strengthening
- Protect the patellofemoral joint
- Normalize running mechanics
- Strength approximately 70% of the uninvolved lower extremity per isokinetic evaluation

**Exercises:**

- Continue flexibility and ROM exercises as appropriate for patient
- Initiate open kinetic chain leg extension (90°-30°), progress to eccentrics as tolerated
- Isokinetics (with anti-shear device)- begin with mid range speeds (120°/sec-240°/sec)
- Progress toward full weight bearing running at about 16 weeks
- Begin swimming if desired
- Recommend isokinetic test with anti-shear device at 14-16 weeks to guide continued strengthening
- Progressive hip, quad, hamstring, calf strengthening
- Cardiovascular/endurance training via Stairmaster, elliptical, bike
- Advance proprioceptive activities

**Phase IV: Post-operative months 4 1/2 or 5 through 6-7****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 three hop tests 85% of uninvolved leg
- Quadriceps and hamstring strength at least 85% of uninvolved 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
  - 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

### **Phase V: Begins at post-operative months 6 or 7**

#### **Criteria for advancement to Phase V:**

- No patellofemoral or soft tissue complaints
- Necessary joint ROM, strength, endurance, and proprioception to safely return to work or athletics
- Physician clearance to resume partial or full activity

#### **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

#### **Bracing:**

- Functional brace generally not used, but may be recommended by the physician on an individual basis