

## Rehabilitation Following ACL with Semitendinosus Reconstruction

### I. IMMEDIATE POSTOPERATIVE PHASE :

#### Goals:

- 1) Protect ACL reconstruction
- 2) Reduce swelling & inflammation
- 3) Restore & maintain full extension
- 4) Gradually restore knee flexion
- 5) Activate quadriceps muscle
- 6) Independent ambulation
- 7) Patient education & protect graft harvest site

#### POD 1

**Brace** Brace locked at zero degrees extension for ambulation

**Weight Bearing** Two crutches as tolerated (at least 50 % WB)

**Range of Motion** - Full passive extension (0-90 degrees) – obtain hyperextension if present on Opposite side....goal is symmetrical motion

#### **Exercises**

- \* Ankle pumps
- \* Passive knee extension to zero or equal to opposite side (hyperextension)
- \* Straight leg raise (flexion)
- \* Hip Abd/Adduction
- \* Knee Extension 90-40 degrees
- \* Quad sets
- \* No Hamstring stretching \*\*

**Muscle Stimulation** Muscle stimulation to quads (4-6 hours per day) during active exercises

**CPM** Zero to 90 degrees

**Ice and Evaluation** Ice 20 minutes out of every hour and elevate with knee in extension

#### POD 2 to 7

**Brace** Brace locked at zero degrees extension for ambulation

**Weight Bearing** Two crutches as tolerated

**Range of Motion** Patient out of brace 45 times daily to perform self ROM 0-90/100 degrees

#### **Exercises**

- \* Intermittent ROM exercises (0-90 degrees)
- \* Patellar mobilization
- \* Ankle pumps
- \* Straight leg raises (4 directions)
- \* Standing weight shifts and mini squats [(030) ROM]

- \* Knee extension 90-40 degrees
- \* Continue quad sets

**Muscle Stimulation** Electrical muscle stimulation to quads (6 hours per day)

**CPM** Zero to 90 degrees

**Ice and Elevation** Ice 20 minutes out of every hour and elevate with knee in extension

## II. **MAXIMUM PROTECTION PHASE (Week 28)**

- Goals:**
- 1) Absolute control of external forces and protect graft
  - 2) Nourish articular cartilage
  - 3) Decrease swelling
  - 4) Prevent quad atrophy

### **A: Week Two**

**Brace** Brace locked at zero degrees for ambulation only, unlocked for self ROM (4-5 times daily)

**Weight Bearing** As tolerated (goal to discontinue crutches 710 days post op)

**Range of Motion** - Self ROM (4-5 times daily), emphasis on maintaining zero degrees passive extension

**KT 2000 Test** (15 lb. anterior-posterior test only)

#### **Exercises**

- \* Multiangle isometrics at 90, 60, 30 degrees
- \* Leg raises (4 planes)
- \* No Hamstring curls
- \* Knee extension 90-40 degrees
- \* Mini squats (0-40) and weight shifts
- \* Lateral Lunges
- \* Leg Press (0-60)
- \* PROM/AAROM 0-105 degrees
- \* Patellar mobilization
- \* No Hamstring and calf stretching
- \* Proprioception training
- \* Well leg exercises
- \* PRE Program start with 1 lb., progress 1 lb. per week

**Swelling control** Ice, compression, elevation

### **B: Week Four**

**Brace** - Brace locked at zero degrees for ambulation only, unlocked for self ROM (4-5 times daily)

**Range of Motion** Self ROM (45 times daily), emphasis on maintaining zero degrees passive extension

#### **Exercises**

- \* Same as week two
- \* PROM 0-125 degrees
- \* Bicycle for ROM stimulus and endurance

- \* Pool walking program, swimming
- \* Initiate eccentric quads 40100 (isotonic only)
- \* Leg press (060)
- \* Emphasize CKC exercise
- \* Emphasize hip strengthening (Hip ER, Abduction, Extension)
- \* Elliptical

**KT 2000 Test** (Week 4, 20 lb. anterior and posterior test)

**Phase Two:** Continued

**C: Week Six**

**Brace** - Discontinue use of drop locked brace

**Exercises**

- \* Same as week four
- \* Hamstring Curls (light resistance)
  - Hip Drills (RDLs, Clams, Lateral slides) etc ....
- \* Pool Program
- \* AROM 0-115 degrees
- \* PROM 0-125 degrees
- \* Emphasize closed chain exercises
- \* Bicycle

**KT 2000 Test** (Week 6, 20 lb. and 30 lb. anterior and posterior test)

**D: Week Eight**

**Brace** - Consider use of functional brace

**Exercises** - Continue PRE program  
Initiate light hamstring PREs

**KT 2000 Test** (Week 8, 20 lb. and 30 lb. anterior and posterior test)

### III. **MODERATE PROTECTION PHASE (Week 10-16)**

**Goals:** Maximal strengthening for quads/lower extremity  
Protect patellofemoral joint

**A: Week 10**

**Exercises**

- \* Knee extension (90-40 degrees)
- \* Leg press (0-60)
- \* Mini squats (0-45)
- \* Lateral step ups
- \* Hamstring curls
- \* Hip Abd/Add
- \* Toe/calf raises
- \* Bicycle
- \* Stairmaster
- \* Wall Squats
- \* Lunges

- \* Pool running
- \* Proprioceptive training
- \* Continue PRE progression (no weight restriction)

**B: Week 12-14**

**Exercise** - Continue all above exercises

**Testing** - Isokinetic Test (180/300 degrees/sec, Full ROM, 10/15 reps)

**KT 2000 Test** Total Displacement at 15 lb., 20 lb. and 30 lb., Manual Maximal Test

Maintain/Begin running (if patient fulfills criteria)

**IV. LIGHT ACTIVITY PHASE (Month 4-5)****Criteria to Enter Phase IV**

- \* AROM 0-125 degrees >
- \* Quad strength 70% of contralateral side, knee flexor/extensor rated 70-79%
- \* No change in KT scores (+2 or less)
- \* Minimal/no effusion
- \* Satisfactory clinical exam

**Goals:** Development of strength, power, endurance  
Begin gradual return to functional activities

**Exercises:** Initiate light straight line running (Physician decision)

**A: Week 20-21****Exercises**

- \* Emphasize eccentric quad work
- \* Continue closed chain exercises, stepups, minisquats, leg press
- \* Continue knee extension 90-140 degrees
- \* Hip abduction/adduction
- \* Initiate plyometric program
- \* Initiate running program
- \* Initiate agility program
- \* Sport specific training and drills
- \* Hamstring curls and stretches
- \* Calf raises
- \* Bicycle for endurance
- \* Pool running (forward/backward)
- \* Walking program
- \* Stairmaster
- \* High speed isokinetics

**Testing** - Isokinetic Test (180/300 degrees/sec, Full ROM, 10/15 reps)

**KT 2000 Test** Total Displacement at 15 lb., 20 lb. and 30 lb., Manual Maximal Test  
Criteria for Running

**Isokinetic Test** - 85% > of opposite leg (quads), 90% > of opposite leg (hamstring)

**Isokinetic Test** - Quad torque/body weight (180 degrees/sec) (60-65% males)(50-55% females)

**KT 2000 Test** – Unchanged

No Pain/Swelling

Satisfactory clinical exam

**Functional Drills**

- \* Straight line running
- \* Jog to run
- \* Walk to run

**V. RETURN TO ACTIVITY PHASE (Month 6 - 7)**

**Goals:** Achieve maximal strength & endurance

Return to sport activities

\* Continue strengthening program for one year from surgery

**4 Quads**

Knee Extensions  
Wall Squats  
Leg Press (40-100)  
Step downs

**4 Strength**

Hamstrings  
Calf Raises  
Hip Abduction  
Hip Adduction

**4 Endurance**

Bicycle  
Stairmaster  
Elliptical  
Swimming

**4 Stability**

High Speed Hamstrings  
High Speed Hip Flexion/Extension  
Balance Drills  
Backward running  
Hip ER/IR strengthening  
Lateral Slides

\*Pick One