



## REHABILITATION FOLLOWING ACL SEMITENDINOSUS RECONSTRUCTION

### I. IMMEDIATE POST OPERATIVE PHASE

#### POD 1

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

**Weight Bearing:** Two crutches as tolerated (less 50 %)

**Range of Motion - Full passive extension (0-90 degrees)**

**Exercises:**

- Ankle pumps
- Passive knee extension to zero
- Straight leg raise (flexion)
- Hip Abd/Adduction
- Knee Extension 90-40 degrees
- Quad sets
- Hamstring stretch

**Muscle Stimulation:** Muscle stimulation to quads (4-6 hours per day) during active exercises & ADL's

**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 4 5 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 [(0 30) 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

**Criteria for discharge from hospital**

- Independent with ambulation with crutches including up/down stairs
- Independent with home exercise program
- PROM 0 90 degrees
- Independent with equipment, i.e., brace, crutches and electrical muscle stimulation.

## II. MAXIMUM PROTECTION PHASE (Week 2-8)

Goals: Absolute control of external forces and protect graft  
Nourish articular cartilage  
Decrease swelling  
Prevent quad atrophy

### 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 7-10 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 :**

- Multi angle isometrics at 90, 60, 30 degrees
- Leg raises (4 planes)
- Hamstring curls (isometrics)
- Knee extension 90-40 degrees
- Mini squats (0-40) and weight shifts
- Lunges
- Leg Press (0-60)
- PROM/AAROM 0-105 degrees
- Patellar mobilization
- 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

### Week Four

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

**Range of Motion:** Self ROM (4-5 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 40-100 (isotonic only)
- Leg press (0-60)
- Emphasize CKC exercise
- Stairmaster
- Nordic Track

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

**Week Six**

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

**Exercises:**

- Same as week four
- Hamstring Curls (light resistance)
- Pool Program
- AROM 0-115 degrees
- PROM 0-125 degrees
- Emphasize closed chain exercises
- Bicycle/Stairmaster etc.

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

**Week Eight**

**Brace** - Consider use of functional brace

**Exercises** - Continue PRE program

**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

**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)

**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)**

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**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

**Week 20-21****Exercises**

- Emphasize eccentric quad work
- Continue closed chain exercises, step ups, mini squats, leg press
- Continue knee extension 90 40 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  
Step Ups

**4 Endurance**

Bicycle  
Stairmaster  
Nordic Trac  
Swimming  
\*Pick One

**4 Strength**

Hamstring Curls  
Calf Raises  
Hip Abduction  
Hip Adduction

**4 Stability**

High Speed Hamstrings  
High Speed Hip Flexion/Extension  
Balance Drills  
Backward running