

## **REHABILITATION FOLLOWING ACL RECONSTRUCTION WITH MENISCAL REPAIR**

**Weight bearing as tolerated – knee brace locked in extension when ambulating for first six weeks, ok to unlock when seated or in bed. Wear 24/7 except in shower, when working with PT, or doing ROM exercises at home.**

### **I. IMMEDIATE POSTOPERATIVE PHASE**

Precautions: - No squatting past 70 degrees for 8 weeks  
- No ACTIVE resisted hamstrings for 8 weeks  
- No ACTIVE knee flexion beyond 90 degrees for 8 weeks  
- No twisting motions for 4 months

Goals - Restore full passive knee extension  
- Diminish joint swelling and pain  
- Restore patellar mobility  
- Gradually improve knee flexion  
- Re-establish quadriceps control  
- Restore independent ambulation

### **POD 1**

Brace locked at zero degrees extension (can lock brace at 0 degrees, strap brace on, then unlock brace and push to -10 degrees to gain full passive knee extension)

Weight Bearing as tolerated, two crutches (may not be able to full weight for a week or two)

#### **Exercises**

- \* Ankle pumps
- \* Passive knee extension to zero, overpressure into full passive extension
- \* Active and passive knee flexion (90 deg by day 5)
- \* Straight leg raises (flexion, abduction, adduction)
- \* Quad sets, glut sets
- \* Hamstring stretch

Muscle Stimulation - Muscle stimulation to quads during quad sets

CPM - PRN, Zero to 90 degrees as tolerated (as directed by physician)

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

### **POD 2 to 3**

Brace locked at zero degrees extension for ambulation and unlocked for sitting, etc.

Weight Bearing - Two crutches, weight bearing as tolerated

Range of Motion Patient out of brace 4-6 times daily to perform self ROM

#### Exercises

- \* Multi-angle isometrics at 90 and 60 degrees (for quads)
- \* Knee Extension 90-40 degrees
- \* Intermittent ROM exercises continued
- \* Patellar mobilization
- \* Ankle pumps
- \* Straight leg raises (multi-plane)
- \* Standing weight shifts and mini squats [(0-30) ROM]
- \* Hamstring curls
- \* Continue quad sets/glut sets

Muscle Stimulation Electrical muscle stimulation to quads

CPM Zero to 90 degrees

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

### **POD 4 to 7**

Brace locked at zero degrees extension for ambulation and unlocked for sitting, etc., or Protonics Rehab System (PRS) as directed by physician

Weight Bearing Two Crutches weight bearing as tolerated

Range of Motion Patient out of brace or in PRS to perform ROM 4-6 times daily, goal knee flexion 90 deg by day 5, 100 deg day 7

#### Exercises

- \* Knee Extension 90-40 degrees
- \* Intermittent PROM exercises
- \* Patellar mobilization
- \* Ankle pumps
- \* Straight leg raises (multi-plane)
- \* Standing weight shift and mini squats (0-30)
- \* Passive knee extension to 0 degrees
- \* Hamstrings curls
- \* Proprioceptive and balance activities

Muscle Stimulation Electrical muscle stimulation

CPM Zero to 90 degrees PRN

## **II. MAXIMUM PROTECTION PHASE (Week 2-3)**

### Criteria to Enter Phase II

- 1) Quad Control (ability to perform good quad set and SLR)
- 2) Full passive knee extension
- 3) PROM 0-90 degrees
- 4) Good patellar mobility
- 5) Minimal effusion
- 6) Independent ambulation with one or two crutches

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

### **A: Week Two**

Goals: Prepare patient for ambulation without crutches

Brace EZ Wrap 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

### Exercises

- \* Muscle stimulation to quadriceps during quadriceps exercises
- \* Multiangle isometrics at 90, 60, 30 degrees
- \* Straight leg raises (4 planes)

- \* Hamstring curls
- \* Knee extension 90-40 degrees
- \* Mini squats (0-40) and weight shifts
- \* PROM 0-105 degrees
- \* Patellar mobilization
- \* Hamstring and calf stretching
- \* Proprioception training
- \* Well leg exercises
- \* Progressive resistance extension (PRE) Program start with 1 lb,

progress 1 lb per week

Swelling control Ice, compression, elevation

**B: Week Three**

Brace – Continue locked brace for ambulation.

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

Full weight bearing No crutches

Exercises

- \* Same as week two
- \* PROM 0-115 degrees
- \* Bicycle for ROM stimulus and endurance
- \* Pool walking program
- \* Initiate eccentric quads 40-100 (isotonic only)
- \* Leg press (0-60)
- \* Stairmaster
- \* Nordic Track

**III. CONTROLLED AMBULATION PHASE (Week 4-10)**

Criteria to Enter Phase III

- \* AROM 0-115 degrees
- \* Quad strength 60 % > contralateral side (isometric test) (60 degree knee flexion angle)
- \* Unchanged KT Test (+1 or less)
- \* Minimal effusion

Goals: Control Forces during walking, restore full knee ROM, improve lower extremity strength, enhance proprioception, balance and neuromuscular control, improve muscular endurance, restore limb confidence

Brace - Discontinue Brace around week 6 when approved by MD

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

#### Exercises

- \* Same as week three
- \* PROM 0 130 degrees
- \* Initiate swimming/pool walking program
- \* Initiate step-ups (start with 2" and gradually increase)
- \* Increase closed kinetic chain rehab
- \* Increase proprioception training

#### **IV. MODERATE PROTECTION PHASE (Week 7-12)**

##### Criteria to Enter Phase IV

- \* AROM 0-125 degrees
- \* Quad strength 60 % of contralateral leg (isokinetic test)
- \* No change in KT scores (+2 or less)
- \* Minimal effusion
- \* No patellofemoral complaints
- \* Satisfactory clinical exam

Goals:           Protect patellofemoral joint's articular cartilage  
                  Maximal strengthening for quads, lower extremity

Manual Maximal Test

Isokinetic Test (Week 10)

#### Exercises

- \* Emphasize eccentric quad work
- \* Plyometric leg press
- \* Perturbation training
- \* Continue closed chain exercises, stepups, minisquats, leg press
- \* Continue knee extension 90-40 degrees
- \* Hip abduction/adduction
- \* Hamstring curls and stretches

- \* Calf raises
- \* Bicycle for endurance
- \* Pool running (forward/backward)
- \* Walking program
- \* Stairmaster
- \* Initiate isokinetic work 100-40 degrees
- \* Initiate active knee flexion with light resistance at week 8

## **V. LIGHT ACTIVITY PHASE (Week 10-16)**

### Criteria to Enter Phase V

- \* AROM 0-125 degrees or greater
- \* 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
- \* Satisfactory isokinetic test (values at 180 degrees)
  - quads bilateral comparison 75%, hamstrings equal bilaterally , quad peak torque/body weight 65% males/55% females, hamstrings/quads ratio 66-75%

Goals:           Development of strength, power, and endurance  
                    Begin to prepare for return to functional activities

Tests Isokinetic test (week 10-12 and 16-18)

### Exercises

- \* Continue strengthening exercises
  - leg press, wall squats, hip abd/adduction, hip flex/ext, knee extension 90-40, hamstring curls, standing toe calf, seated toe calf, step down, lateral step ups, lateral lunges, lateral step-overs cones, tilt board drills/perturbation training, sports RAC repositioning on tilt board
- \* Initiate plyometric program
- \* Initiate running program
- \* Initiate agility drills
- \* Sport specific training and drills

### Criteria to initiate running program (week 12)

- \* Satisfactory isokinetic test

- \* Unchanged KT results
- \* Functional test 70% > contralateral leg
- \* Satisfactory clinical exam

## **VI. RETURN TO ACTIVITY PHASE (Month 3-6)**

### Criteria to return to activities

- \* Isokinetic test that fulfills criteria
- \* KT 2000 Test unchanged
- \* Functional test 85% > contralateral leg
- \* Proprioceptive test 100% of contralateral leg
- \* Satisfactory clinical exam
- \* Quad bilateral comparison 80% or greater
- \* Hamstring bilateral comparison 110% or greater
- \* Quad torque/body weight ratio 55% or greater (female) (65% male)
- \* Hamstring/quad ratio 70% or greater

Goals: Achieve maximal strength and further enhance neuromuscular coordination and endurance

Tests Isokinetic test prior to return, KT 2000 test, functional test

### Exercises

- \* Continue strengthening program
- \* Continue closed chain strengthening program
- \* Continue plyometric program
- \* Continue running and agility program
- \* Accelerate sport specific training and drills