

REHABILITATION FOLLOWING ACL-BTB RECONSTRUCTION

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

POD 1

Brace locked at zero (or -10) degrees extension

Weight Bearing as tolerated, two crutches

Exercises

- * Ankle pumps
- * Passive knee extension to zero
- * Straight leg raises
- * 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

Weight Bearing as tolerated, two crutches

Range of Motion: Patient out of brace 4-5 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

Weight Bearing: Two Crutches, weight bearing as tolerated

Range of Motion: Patient out of brace to perform ROM 4-5 times daily

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: locked at -10 or zero degrees for ambulation only

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
- * 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
- * PRE Program start with 1 lb, progress 1 lb per week

Swelling control Ice, compression, elevation

B: Week Three

Brace - Discontinue locked brace as long as *excellent* quad control. Brace opened 0-125 degrees 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 4-7)

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

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 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
- * 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

V. LIGHT ACTIVITY PHASE (Month 2 1/2 - 3 1/2)

Criteria to Enter Phase V

- * 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, and endurance
 Begin to prepare for return to functional activities

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

Exercises

- * Continue strengthening exercises
- * Initiate plyometric program
- * Initiate running program
- * Initiate agility drills
- * Sport specific training and drills

Criteria to initiate running program

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

VI. RETURN TO ACTIVITY PHASE (Month 3 1/2 - 4 1/2)

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

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