

I. IMMEDIATE POST OPERATIVE PHASE

POD 1

Brace: EZ Wrap brace locked at zero degrees extension or Protonics Rehab System (PRS) as directed by physician

Weight Bearing: Two crutches as tolerated

Exercises:

- Ankle pumps
- Passive knee extension to zero
- Straight leg raises
- Quad sets, glut sets
- Hamstring stretch

Muscle Stimulation: Muscle stimulation to quads (4 hours per day) 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: EZ Wrap 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 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 (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

POD 4 to 7

Brace: EZ Wrap 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 4-5 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 (continue 6 hours daily)

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), or PRS program as indicated.

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

- Muscle stimulation to quadriceps during quadriceps exercises
- Multi angle 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. 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

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

KT 2000 Test: (Week 4, 20 lb anterior and posterior test)
 (Week 6, 20 and 30 lb anterior and posterior test)

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

KT 2000 Test: (Week 10) Total Displacement at 15 lb, 20 lb and 30 lb, Manual Maximal Test

Isokinetic Test: (Week 10)

Exercises

- Emphasize eccentric quad work
- Continue closed chain exercises, step ups, mini squats, 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 ½-4 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

6 MONTH FOLLOW UP

Isokinetic test
KT 2000 test
Functional test

12 MONTH FOLLOW UP

Isokinetic test
KT 2000 test
Functional test