

REHABILITATION PROTOCOL FOR ACL/PCL/MCL MULTILIGAMENTOUS KNEE RECONSTRUCTION**I. IMMEDIATE POSTOPERATIVE PHASE (Day 1 - 13)**

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

Restrictions: No abduction or adduction for 6 weeks, no active hamstrings or hamstring stretches for 6 weeks

PROM Only with posterior support to protect PCL repair (may perform PROM in seated position or in prone position)

POSTOPERATIVE DAY 1 - 4

- **Brace:**
 - Drop lock brace locked at zero degrees extension with compression wrap
 - Sleep in brace
- **Weightbearing:**
 - Two crutches, non weight bearing
- **Range of Motion:**
 - Range of motion 0 – 45/50°
 - CPM 0 - 60° as tolerated
- **Exercises:**
 - Ankle pumps
 - Quad sets
 - Straight leg raising in locked brace
 - Muscle stimulation to quadriceps (4 hours per day) during quad sets & straight leg raises
 - Patellar mobilizations 5-6x daily

- Ice and elevation every 20 minutes of each hour with knee in extension

POSTOPERATIVE DAY 5 – 13

- **Brace:**
 - Continue use of drop lock brace locked at zero degrees extension during ambulation & sleep
- **Weightbearing:**
 - Two crutches: non weight bearing
- **Range of motion:**
 - Day 5: 0 - 65°
 - Day 7: 0 - 75°
 - Day 10: 0 - 85/90°
 - Day 13: 0 - 90°
 - Gradually increase CPM ROM 0 - 70° day 7; 0 - 90° day 12
- **Exercises:**

- Continue previous exercises
 - Initiate knee extension 60 - 0°
 - Continue use of muscle stimulation
 - Patellar mobilizations 5-6x daily
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- Continue use of ice, elevation, and compression

II. MAXIMUM PROTECTION PHASE (Week 3 to 6)

Criteria to Enter Phase II:

1. Good 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 joint effusion

Goals: Control deleterious forces to protect grafts

Nourish articular cartilage
Decrease swelling
Decreased fibrosis
Prevent quad atrophy
Initiate proprioceptive exercises

WEEK 3

- Brace:
 - Continue use of brace locked at zero degrees of extension
- Weightbearing:
 - Gradually increase WB to 25% toe touch WB
- Range of Motion:
 - Continue to perform passive ROM 5-6x daily
 - Day 14: 0 - 90°
- Exercises:
 - Continue quad sets & straight leg raises
 - Continue knee extension 60 - 0°
 - Multi-angle isometrics at 80°, 60° and 40°
 - Patellar mobilizations 5-6x daily
 - Well leg bicycle
 - Weight shifts
 - Mini-squats (0 - 45°)
 - Continue use of muscle stimulation

AVOID PRONE HANGS DUE TO RISK FOR HAMSTRING GUARDING

- Continue ice, elevation, and compression

WEEK 4

- Brace:
 - Continue use of brace locked at zero degrees extension
 - Discontinue sleeping in brace

Weightbearing:

- 25% TTWB
- Range of Motion:
 - AAROM, PROM: 0 – 90/100°
- Exercises:
 - Weight shifts
 - Mini-squats (0 - 45°)
 - Knee extension 90 - 40° (therapist discretion)
 - Light pool exercises and walking
 - Initiate bicycle for ROM & endurance
 - Begin leg press 60 - 0° (light weight)
 - Proprioception/balance drills

WEEK 5 – 6

- Week 5 – 50% PWB
- Week 6 – 75% PWB
- Unlock brace for ambulation after week 6
- Fit for functional ACL/PCL brace

- Range of Motion week 5: 0 - 105°; week 6: 0 - 115°
- Continue pool exercises
- Initiate lateral lunges
- Hip abduction and adduction

III. MODERATE PROTECTION PHASE (Week 7 – 12)

Criteria to Enter Phase III:

1. PROM 0 – 115 degrees
2. Full weightbearing
3. Quadriceps strength > 60% contralateral side (isometric test at 60°)
4. Unchanged KT test (+1 or less)
5. Minimal to no full joint effusion
6. No joint line or patellofemoral pain

Goals: Control forces during ambulation

Progress knee range of motion

Improve lower extremity strength

Enhance proprioception, balance, and neuromuscular control

Improve muscular endurance

Restore limb confidence and function

Restrictions: No injured leg bike, may begin prone

- Brace:
 - Continue use of unlocked brace for ambulation – discharge week 7 – 8
- Range of Motion:
 - AAROM/PROM 0 - 125°
- Exercises:
 - Continue previous exercises

- Initiate swimming
- Initiate lateral and front step-ups (2" step, gradually increase)
- Progress closed kinetic chain exercises (squats 0 - 60°, leg press 90 - 0°)
- May begin light hamstring isotonic week 8
- Progress proprioceptive training

IV. CONTROLLED ACTIVITY PHASE (Week 13 – 16)

Criteria to Enter Phase IV:

1. AROM 0 - 125°
2. Quadriceps strength > 60-70 contralateral side (isokinetic test)
3. No change in KT scores (+2 or less)
4. Minimal effusion
5. No patellofemoral complaints
6. Satisfactory clinical exam

Goals: Protect healing grafts

Protect patellofemoral joint articular cartilage
Normalize lower extremity strength
Enhance muscular power and endurance
Improve neuromuscular control

- Exercises:
 - Continue previous exercises
 - Emphasis on eccentric quadriceps strengthening
 - Continue closed kinetic chain mini-squats, step-ups, step-downs, lateral lunges, leg press
 - Continue knee extension 90 - 40°
 - Hip abduction & adduction
 - Initiate front lunges
 - Calf raises (gastroc and soleus strengthening)
 - Bicycle and stairmaster for endurance
 - Initiate pool running (side shuffle, backward, forward)
 - Initiate walking program
 - Initiate isokinetic exercise 100 - 40° (120-240 °/s spectrum)

V. LIGHT ACTIVITY PHASE (Month 4 – 6)

Criteria to enter Phase V:

1. AROM > 125 degrees
2. Quadriceps strength 70% of contralateral side; flexion/extension ratio 70-79%
3. No change in KT scores (+2 or less)
4. Minimal joint effusion
5. Satisfactory clinical exam

Goals: Enhancement of strength, power, and endurance
Initiate functional and/or sport-specific activity
Prepare for return to functional activities

- Exercises:
 - Continue strengthening exercises – emphasize quadriceps & co-contraction
 - Initiate plyometric program month 4-5
 - Initiate running program month 4-6
 - Initiate agility drills month 5-6
 - Initiate sport-specific training and drills month 5-6
- Isokinetic strength test at week 16 & week 18

Criteria to initiate running program:

- Acute reconstruction may begin at 4 – 5 months
- Chronic reconstruction may begin at 5 – 6 months
 1. Satisfactory clinical exam
 2. Unchanged KT test
 3. Satisfactory isokinetic test
 - Quadriceps bilateral comparison (80% or greater)
 - Hamstring bilateral comparison (110% or greater)
 - Quadriceps torque/body weight ratio (55% or greater)
 - Hamstrings/Quadriceps ratio (70% or greater)
 4. Proprioception testing 100% of contralateral side
 5. Functional hop test > 75% of contralateral leg

VI. RETURN TO ACTIVITY PHASE (Month 6 – 9)

Criteria to return to activities:

1. Satisfactory clinical exam
2. Unchanged KT test
3. Satisfactory isokinetic test
4. Proprioception testing 100% of contralateral side
5. Functional hop test > 80% of contralateral leg

Goals: Gradual return to full-unrestricted sports

Achieve maximal strength and endurance
Normalize neuromuscular control
Progress skill training

- Exercises:
 - Continue strengthening programs
 - Continue proprioception & neuromuscular control drills
 - Continue plyometric program
 - Continue running and agility program
 - Progress sport specific training and drills