

Knee Multi-ligament Reconstruction

Phase I (1 – 5 days post-op)

- Wound care: Observe for signs of infection
- Modalities: Cryotherapy for pain and edema control
- Brace: Locked in extension 24 hours/day
- Gait: NWB until 6 weeks post-op
- ROM:
 - AROM for hip and ankle
 - Avoid hip extension if hamstring repair
 - Maintain full passive knee extension
 - Avoid prone hang secondary to hamstring guarding
 - Gentle stretching of hamstrings and gastroc/soleus
 - No hamstring stretching if PCL repair
- Exercises: Quad sets

Phase II (5 days – 6 weeks post-op)

- Precautions: No open-kinetic-chain hamstring strengthening
- Wound care: Continue to monitor for signs of infection and begin scar management techniques when incision is closed
- Modalities:
 - Cryotherapy for pain and edema control
 - Enhance quad sets with low intensity NMES or biofeedback
- Brace: Locked in extension 24 hours/day
- Gait: NWB until 6 weeks post-op
- ROM:
 - Begin patellar mobilizations when incision is closed
 - PROM
 - Flexion 0-105*
 - If lateral hamstring repair: 20-75*
 - ACL and PLL: 0-90*
 - ACL and LCL: 0-50*
- Strengthening: Continue Phase I

Phase III (6 weeks – 10 weeks post-op)

- Wound care: Continue to monitor for signs of infection and continue scar mobilization
- Modalities: High intensity NMES at 60 degrees of knee flexion
- Brace: Open brace to full flexion
 - PCL: continue to wear at night
 - At 8-12 weeks, begin to wean from brace

- Gait: At 6 weeks, begin PWB of 25%, increase by 25% weekly
- ROM:
 - Full ROM: 0-125*
 - Passive flexion exercises (consider CPM if no PCL involvement)
 - Prone hangs
 - Continue patellar mobilizations
 - Stationary bike for ROM assist
- Strengthening:
 - Begin hip strengthening- NO adduction if PCL involvement
 - Proprioceptive and weight shifting activities, beginning with brace on

Phase IV (10+ weeks post-op)

- Brace: D/C brace at 12 weeks
- Strengthening:
 - Initiate closed chain strengthening once FWB has been achieved and quad strength is greater than or equal to 3+/5
- Testing: Initial Lower Extremity Function Tests between weeks 10-16

4 months (16 weeks)

- ROM: Aggressive flexion- contact physician if <90 degrees by 20 weeks
- Strengthening:
 - Closed chain and Hip PREs: avoid flexion beyond 70 degrees
 - Isolated quad and hamstring exercises: NO resistance
 - Closed chain conditioning exercises: stair climbing, stationary bike, etc
 - Single leg proprioception exercises (BAPS, mini trampoline)
 - Straight line jogging at end of post-op month 4

5 months (20 weeks)

- Brace: Contact physician regarding fitting for ACL/PCL functional brace
- Strengthening
 - Closed chain and Hip PREs
 - Initiate resisted quad and hamstring exercises
 - Initiate low intensity plyometrics
 - Progress jogging and initiate sprints
 - Advance proprioception training

6 months (24 weeks)

- Progression of all strengthening exercises
- Begin agility and sport-specific drills

Initiation Date: 01-01-05 Revised Date: 04-30-14, 10-22-19

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- Initiate running program as appropriate

7 – 12 months

- Testing: Final lower extremity functional tests less than 25% for non-athlete and less than 20% for athlete
- Return to Sports if the following criteria are met:
 - Minimal or no pain and swelling
 - Function tests within 10-15% of uninvolved side
 - Successful completion of sport-specific drills

Adapted From:

- 1) Fanelli G. *The Multiple Ligament Injured Knee: A Practical Guide to Management*. New York: Springer; 2003.
- 2) Advanced CEU, Wilk, KE. *Multi-Ligament Reconstruction*, 2019.
- 3) UW Health Sports Rehabilitation: *Rehabilitation Guidelines for Knee Multi-Ligament Repair/Reconstruction*; 2018.