

Multi Ligament Knee Reconstruction: **Rehabilitation Protocol**

Phase I: 0-6 weeks

Goals:

- Maximum protection of the grafts
- Maintain patella mobility
- Regain quadriceps tone
- Maintain full passive extension
- Control pain & swelling
- Introduce early ROM

Program:

- ✓ TTWB ambulation with crutches
- ✓ Brace locked in Extension- 24 hours/day
- ✓ Cryotherapy
- ✓ Quad Sets - enhance with low intensity e-stim /biofeedback
- ✓ Patella mobilization
- ✓ Ankle pumps-ROM
- ✓ Stretching exercises – gastroc-soleus & gentle hamstrings
- ✓ Hip Abduction (If MCL or LCL reconstruction avoid valgus or varus stress respectively).

At 2 weeks post-op, begin gentle passive ROM out of brace

Week 1:

- Knee in Immobilizer locked in full extension at all times
- Isometric quad exercises
- Avoid exercises that allow unopposed hamstring function
- Cryo-cuff as needed

Week 2:

- Gentle PROM 0-45 degrees in prone position to minimize hamstring Force
- Supplement quad sets with e-stim as tolerated
- Patellar mobilization

Week 3-6:

- Incorporate scar massage into program
- Obtain 90 degrees of flexion by week 6

Phase II: 6-12 weeks

Goals:

- Initiate weight bearing for articular cartilage nourishment
- Increase knee flexion
- Maintain/Increase quadriceps tone
- Improve proprioception
- Avoid isolated quadriceps & hamstring contraction

Program: 6-12 weeks

- ✓ Begin PWB gait of 25% BW, increase 50% over next 2 weeks
- ✓ Open brace to full flexion- with PLC continue to wear brace at night
- ✓ Prone hangs
- ✓ Passive flexion exercises
- ✓ Patella mobilization
- ✓ High-intensity e-stim at 60 degrees of knee flexion
- ✓ Initiate closed chain strengthening once FWB & quad strength is 3+/5 or >
- ✓ Stationary bike for ROM assist
- ✓ Proprioception & weight shift (KAT or BAPS board)
- ✓ Hip strengthening: no adduction id PCL is involved
- ✓ Discontinue brace at end of week 12
- ✓ Encouraged to achieve flexion to 120 degrees the end of post-op month 3
- ✓ Closed chain exercises in 0-60 degrees (Leg press, squats, lunges, etc.)
- ✓ Pool walking if available
- ✓ Single leg stance exercises (patient may practice at home in front of a mirror)

Phase III: 4-6 months

Goals:

- Increase Knee flexion
- Maintain full passive extension
- Improve quadriceps & hamstring strength
- Improve proprioception
- Improve functional skills
- Increase cardiovascular endurance

Program:

4 Months:

- ✓ Closed chain PRE's—avoid flexion beyond 70 degrees
- ✓ Isolated quadriceps & hamstring exercises—no resistance
- ✓ Single leg proprioception exercises (KAT, BAPS, mini-trampoline)
- ✓ Closed chain conditioning exercises—stair climber, skiing machine, rower, etc.
- ✓ Aggressive flexion ROM—Consider manipulation if flexion <90 by the end of the 4th month
- ✓ Hip PRE's
- ✓ Straight line jogging at end of post-op month 4 if functional strength is 70% of uninvolved side; start with fast walk & progress

5 Months:

- ✓ Initiate resisted quadriceps & hamstring exercises
- ✓ Progress closed chain strengthening & conditioning exercises
- ✓ Initiate low-intensity plyometrics
- ✓ Progress jogging & begin sprints
- ✓ Advance proprioceptive training
- ✓ Fit for ACL/PCL functional brace

6 Months:

- ✓ Progression of all strengthening exercises & plyometrics
- ✓ Begin agility drills—carioca, figure 8's, zigzag, slalom running, etc. in brace
- ✓ Sport specific drills (prefer to have quad & hamstring deficits < 20% prior to beginning)
- ✓ Isokinetic testing at end of post-op month 6
- ✓ Patient may return to heavy labor if criteria met

Phase IV: 7-12 months

Program:

- ✓ Assess functional strength—single-leg hop for distance, timed hop test, shuttle run etc.
- ✓ Return to sports if following criteria are met:
- ✓ Minimal or no pain & swelling

- ✓ Isokinetic & functional tests within 10%-15% of the uninvolved side
- ✓ Successful completion of sport-specific drills
- ✓ ACL/PCL functional brace