



KNEE MULTILIGAMENT RECONSTRUCTION: ACL, PCL, PLC POST-OPERATIVE GUIDELINES

Post-Operative Phase 1: Weeks 0-6

PRECAUTIONS

- Range of motion (ROM)
 - 0-90 degrees, as tolerated
 - Do not force ROM
- Adhere to weight bearing restrictions
 - 20% foot-flat weight bearing (FFWB) with bilateral axillary crutches
- Brace guidelines
 - Ambulation with brace locked and bilateral axillary crutches
 - Sleep with brace locked in extension for 6 weeks
- Avoid pillow under knee to prevent knee flexion contracture
- Avoid knee flexion active range of motion (AROM)

TREATMENT RECOMMENDATIONS

- Edema control (cryotherapy)
- Soft tissue mobilization, if indicated
 - Quadriceps, hamstring, gastrocnemius/soleus
- Immediate ROM after surgery
 - Do not force ROM
 - Passive ROM 0-40 degrees, progress as tolerated
 - Active-assisted ROM knee extension and PROM knee flexion pain-free (e.g., seated knee flexion off table)
 - Heel slides against wall (ROM >70 degrees)
- Emphasize full knee extension immediately
 - Calf prop with pillow multiple times per day (avoid hyperextension)
 - LE stretching, including hamstring, gastrocnemius, soleus
 - *Modification: avoid hamstring stretching if hamstring autograft is used*
- Patella mobilization as indicated (all planes)
- Strengthening
 - Quadriceps re-education with neuromuscular electrical stimulation (NMES)
 - Straight leg raise (SLR) flexion, extension, and adduction; avoid hip abduction open kinetic chain (OKC) and emphasize no extensor lag
 - Brace locked in extension if pain/lag
 - Ankle/hip/core progressive resistive exercises (PRE)
 - Short crank bicycle, once sufficient ROM of 85-90 degrees knee flexion is attained
- Consider Blood Flow Restriction (BFR) program with FDA approved device and qualified therapist with surgeon clearance
- Independent with home exercise program (HEP) that addresses primary impairments



- Cardiovascular exercises (e.g., upper body ergometer), as tolerated

CRITERIA FOR ADVANCEMENT

- Adherence to post-operative restrictions
- Control post-operative pain/swelling
- Continued improvement in patella mobility and proximal strength
- Maintain knee ROM 0-90 degrees
- SLR flexion without extensor lag
- Independent with HEP

EMPHASIZE

- Ambulation with brace locked in extension and 20% FFWB
- Control pain/effusion
- Patella mobility
- Knee ROM 0-90 degrees
- Improve quadriceps activation



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Post-Operative Phase 2: Weeks 7-12

PRECAUTIONS

- Progress knee ROM to 0-130 degrees, do not force motion
- Adhere to weight bearing restrictions
 - Progress to weight bearing as tolerated (WBAT) while demonstrating proper gait
- Brace guidelines: progress to functional brace, as per surgeon
- Avoid pillow under knee to prevent knee flexion contracture
- Avoid varus stress with supine positioning (avoid hip external rotation)
- Avoid resisted OKC knee flexion PRE

TREATMENT RECOMMENDATIONS

- Patient education on continued activity modification and cryotherapy
- Gait training: PWB to WBAT
 - Discontinue crutches when patient demonstrates normal gait pattern
 - Unlock brace when adequate quadriceps control
- Continue with LE stretching program from phase 1
- Gradual increase of knee ROM to full
 - Week 12: 0-130 degrees
 - Step knee flexion stretch
 - Maintain passive knee extension
 - Continue patella mobilizations as needed
- Strengthening
 - Continue with NMES as needed for quadriceps activation
 - Quadriceps isometrics at 60 degrees knee flexion
 - Closed kinetic chain (CKC) knee extension: resisted terminal knee extensions
 - Progress multiplanar core/hip strengthening: continue Phase 1 exercises, clamshells, bridges with resistance band, CKC hip strengthening – static to dynamic (e.g., contralateral hip abduction/extension)
 - Leg press: light weight bilateral, 60-0 degrees knee ROM arc
 - Squats: 60-0 degrees knee ROM)
 - Forward step up (FSU) 6" → 8"
 - Romanian dead lifts (RDLs)
 - Standing bilateral heel raises
 - Progress to upright stationary bicycle once sufficient ROM of 110-115 degrees knee flexion is obtained
 - Retro-ambulation with focus on quadriceps neuromuscular control
 - Hydrotherapy when incisions are healed – for gait, proximal strengthening, functional movements, balance, and edema control



- Weight shift exercises with upper extremity (UE) support: bilateral leg balance/proprioceptive activities; progress to unilateral/uneven surfaces
- Consider BFR program with FDA approved device and qualified therapist with surgeon clearance

CRITERIA FOR ADVANCEMENT

- Normal gait pattern without assistive device
- Knee ROM: 0-130 degrees
- Isometric quadriceps contraction at 60 degrees knee flexion at 70% of contralateral LE
- Proximal MMT > 4/5
- Ascend 8" FSU

EMPHASIZE

- Compliance with brace
- Discontinue crutches only when normal gait demonstrated
- Modify load and activities of daily living (ADL)
- Patella mobility



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Post-Operative Phase 3: Weeks 13-24

PRECAUTIONS

- Avoid pivoting or excessive varus force

TREATMENT RECOMMENDATIONS

- Range of motion
 - Gradual increase of ROM to full
 - Continue LE flexibility exercises
 - Prone quadriceps stretch
 - Supine or kneeling hip flexor stretch
 - Continue patella mobilization as needed
- Brace
 - Functional knee brace, per surgeon
 - Discharge brace per surgeon direction
- Soft tissue mobilization as needed
- Strengthening
 - Progress stationary bicycle time
 - Progress to elliptical – when able to perform FSU 8”
 - Leg press bilateral → eccentric → unilateral
 - Retro-ambulation for neuromuscular quadriceps control
 - Underwater treadmill/anti-gravity treadmill training if gait pattern continues to be abnormal
 - Squats: progress squat depth over duration of phase no greater than 90 degrees knee flexion; progress to single leg squat
 - Progress FSU program
 - Initiate step-down program, emphasize proper movement pattern without deviations
 - RDL: double leg → single leg
 - Progress hip/core stabilization/kinetic linking program
- Progress balance/proprioception to include perturbation
- BFR program with FDA approved device and qualified therapist if patient cleared by surgeon
- Initiate bilateral plyometrics/running program after demonstrating the ability to descend 8” step without pain/deviation

CRITERIA FOR ADVANCEMENT

- Ability to descend 8” step
- Isokinetic testing – 85% limb symmetry (quadriceps/hamstrings)