

ACLR AND MCL REPAIR CLINICAL PRACTICE GUIDELINE



Summary of Recommendations

Precautions	<ul style="list-style-type: none"> No testing of repaired or reconstructed ligaments prior to 12 weeks No isotonic resisted hamstring exercises for 8 weeks with hamstring autograft No loaded open kinetic chain knee extension beyond 45 degrees for 8 WEEKS Meniscus Repair: <ul style="list-style-type: none"> No weight-bearing (WB) therapeutic exercise >90° x 8 WEEKS No forced flexion beyond 90° x4 WEEKS
Weight Bearing Guidelines	<ul style="list-style-type: none"> NWB for 0-2 weeks with brace locked in extension TTWB for weeks 2-4 with brace locked in extension WBAT 4-6 weeks with brace locked in extension WBAT at 6 weeks with brace unlocked, wean from brace
MCL Lesion Site Considerations	<ul style="list-style-type: none"> Distal: Cautious knee flexion ROM to allow healing and prevent long-term valgus laxity. <ul style="list-style-type: none"> Weeks 0-2: 0-30° Weeks 2-4: 0-60° Weeks 4-6: 0-90° Weeks 6+: flexion ROM as tolerated Proximal or Mid-substance: Accelerated knee flexion ROM to prevent scar formation and loss of functional ROM.
Criteria to Discharge Assistive Device	<ul style="list-style-type: none"> <u>ROM</u>: Full active knee extension; no pain on passive overpressure <u>Strength</u>: Able to perform strong quad isometric with full tetany and superior patellar glide and able to perform 20 SLR without quad lag <u>Effusion</u>: 1+ or less is preferred (2+ acceptable if all other criteria are met) <u>Weight Bearing</u>: Demonstrates pain-free ambulation without visible gait deviation
Criteria to Initiate Running and Jumping	<ul style="list-style-type: none"> <u>ROM</u>: full, pain-free knee ROM, symmetrical with the uninvolved limb <u>Strength</u>: Isokinetic testing 80% or greater for hamstring and quad at 60°/sec and 300°/sec <u>Effusion</u>: 1+ or less <u>Weight Bearing</u>: normalized gait and jogging mechanics <u>Neuromuscular Control</u>: Pain-free hopping in place without dynamic knee valgus
Criteria for Return to Sport	<ul style="list-style-type: none"> <u>ROM</u>: full, pain-free knee ROM, symmetrical with the uninvolved limb <u>Strength</u>: Isokinetic testing 90% or greater for hamstring and quad at 60°/sec and 300°/sec <u>Effusion</u>: No reactive effusion ≥ 1+ with sport-specific activity <u>Weight Bearing</u>: normalized gait and jogging mechanics <u>Neuromuscular control</u>: appropriate mechanics and force attenuation strategies with high level agility, plyometrics, and high impact movements <u>Functional Hop Testing</u>: LSI 90% or greater for all tests <u>Physician Clearance</u>

Early Post-Operative Phase (0-4 Weeks)

Appointments	<ul style="list-style-type: none"> Post-operative evaluation should be performed 2-5 days following surgery. Follow-up PT appointments 1-2x per week, depending on progression towards goals.
Precautions	<ul style="list-style-type: none"> No testing of repaired or reconstructed ligaments (Lachman, Anterior Drawer, Valgus Stress) prior to 12 WEEKS No loaded open kinetic chain knee extension for 8 WEEKS Weight-bearing: <ul style="list-style-type: none"> TTWB for 0-2 weeks with brace locked in extension WBAT for weeks 2-4 with brace locked in extension
Pain and Effusion	<ul style="list-style-type: none"> Goal is $\leq 2+$ (using Modified Stroke Test) Cryotherapy and compression
ROM	<ul style="list-style-type: none"> <u>Extension</u>: Emphasis on achieving full knee extension immediately following surgery. If full extension is not achieved by 4 weeks, contact surgeon regarding ROM concerns. <u>Flexion</u>: <ul style="list-style-type: none"> Flexion PROM/AAROM 0-30° for distal MCL lesion weeks 0-2 Flexion PROM/AAROM 0-60° for distal MCL lesion weeks 2-4 No forced flexion beyond 90° with meniscal repairs
Therapeutic Exercise	<ul style="list-style-type: none"> Emphasis on quad activation without gluteal co-contraction Restore patellar mobility Symmetrical extension ROM Decrease effusion
Suggested Interventions	<ul style="list-style-type: none"> Extension PROM: bag hangs or prone hangs Flexion PROM/AAROM: heel slides or wall slides with slight varus position • Bike: Begin with ½ and progress to full revolutions only with proximal MCL lesions; keep knee in slight varus positions Patellar mobilization: superior, inferior, medial, lateral Quad Isometrics; SLR 4-way with brace on until no extensor lag TKE: prone weeks 0-2; standing TTWB weeks 3-4 Non-involved single leg balance with involved leg multidirectional hip (Reverse Steamboats) Begin Neuromuscular re-education using electrical stimulation (NMES) in long sitting with pads on proximal and distal quadriceps
Criteria to Progress	<ul style="list-style-type: none"> <u>ROM</u>: $\geq 0-90$ degrees. If full AROM knee extension is not achieved by 4 weeks, contact surgeon regarding ROM concerns. <u>Strength</u>: Quadriceps set with normal superior patellar translation, 20x SLR without extensor lag <u>Effusion</u>: 2+ or less with Modified stroke test

Middle Phase of Rehabilitation (4-12 Weeks)

Appointments	<ul style="list-style-type: none"> Goal to increase lower extremity strength and regain flexion ROM. 1-2 visits per week with emphasis on patient compliance with resistance and ROM training as part of HEP (2-4 days per week outside of therapy).
Precautions	<ul style="list-style-type: none"> Avoid dynamic knee valgus with all interventions, including warm-up and endurance activities

	<ul style="list-style-type: none"> ● Open Chain knee extension: <ul style="list-style-type: none"> ○ Initiate submaximal leg extension 90-45 degrees ○ Initiate knee AROM 90-0 degrees (modify if painful) ● No isolated resisted hamstrings strengthening until 8 weeks with hamstring autograft ● Weight-bearing: <ul style="list-style-type: none"> ○ WBAT 4-6 weeks with brace locked in extension ○ WBAT at 6 weeks with brace unlocked, wean from brace
Criteria to Discharge Assistive Device	<ul style="list-style-type: none"> ● <u>ROM</u>: Full active knee extension; no pain on passive overpressure ● <u>Strength</u>: Able to perform strong quad isometric with full tetany and superior patellar glide and able to perform 20 SLR without quad lag ● <u>Effusion</u>: 1+ or less is preferred (2+ acceptable if all other criteria are met) ● <u>Weight Bearing</u>: Demonstrates pain-free ambulation without visible gait deviation
Pain and Effusion	<ul style="list-style-type: none"> ● Cryotherapy/compression as needed for effusion ● Patellar taping to reduce PF symptoms if present
ROM	<ul style="list-style-type: none"> ● Distal MCL lesion: Continue cautious knee flexion ROM to allow healing <ul style="list-style-type: none"> ○ Weeks 4-6: ROM 0-90° ○ Weeks 6+: flexion ROM as tolerated ● Monitor and progress knee ROM, patellar mobility, and LE flexibility ● Begin more aggressive techniques to achieve/maintain full knee extension (i.e. weighted bag hang) as needed ● ROM progression from AAROM to AROM ● Initiate bike for ROM and warm-up for distal MCL lesions, keeping knee in slight varus position
Suggested Interventions and Timelines	<ul style="list-style-type: none"> ● Multi-angle knee isometrics from 60-90° for patients unable to tolerate high-intensity NMES ● Initiate open chain knee extension exercises <ul style="list-style-type: none"> ○ Unweighted full range LAQ ○ Protected range with isotonic progression ● Initiate and progress WB strengthening/stability with emphasis on proper LE mechanics avoiding knee valgus <ul style="list-style-type: none"> ○ Lunges, shuttle, steamboats, side-stepping, leg press, step up/down ● Progress gluteal and lumbopelvic strength and stability ● Progress single leg balance and proprioceptive exercises ● Endurance: <ul style="list-style-type: none"> ○ Biking at week 6 ○ Treadmill walking, stepper, elliptical at week 8 ● Initiate PWB plyometrics on shuttle at weeks 8-10 weeks (see criteria to begin full WB plyometrics) ● NMES
Criteria to Progress	<ul style="list-style-type: none"> ● <u>ROM</u>: Maintain full, pain free AROM including patellofemoral mobility ● <u>Effusion</u>: 1+ or less ● <u>Strength</u>: Isometric or isokinetic quadriceps and hamstrings strength \geq 80% ● <u>Weight Bearing</u>: Able to tolerate therapeutic exercise program, including PWB plyometrics, without increased pain or $>1+$ effusion ● <u>Neuromuscular Control</u>: Demonstrates proper lower extremity mechanics with all therapeutic exercises (bilateral)

Late Phase of Rehabilitation (week 12-Return to Sport)

Appointments	<ul style="list-style-type: none"> Increased frequency from previous stage to 1-2x per week when appropriate to initiate plyometric training and return to running program.
Criteria to Initiate Running and Jumping	<ul style="list-style-type: none"> <u>ROM</u>: full, pain-free knee ROM, symmetrical with the uninvolved limb <u>Strength</u>: Isokinetic testing 80% or greater for hamstring and quad at 60°/sec and 300°/sec <u>Effusion</u>: 1+ or less <u>Weight Bearing</u>: normalized gait and jogging mechanics <u>Neuromuscular Control</u>: Pain-free hopping in place
Pain and Effusion	<ul style="list-style-type: none"> Effusion may increase with increased activity, ensure ≤1+ and/or non-reactive effusion for progression of plyometrics
ROM	<ul style="list-style-type: none"> Full, symmetrical to contralateral limb, and pain-free with overpressure
Therapeutic Exercise	<ul style="list-style-type: none"> Performance of the quadriceps, hamstrings and trunk dynamic stability Muscle power generation and absorption via plyometrics Sport- and position-specific activities Begin agility exercises between 50-75% effort (utilize visual feedback to improve mechanics as needed) Advance plyometrics: Bilateral to single leg, progress by altering surfaces, adding ball toss, 3D rotations, etc.
Suggested Interventions	<ul style="list-style-type: none"> Therapeutic Exercise/Neuromuscular Re-education <ul style="list-style-type: none"> Squats, leg extension, leg curl, leg press, deadlifts, lunges (multi-direction), rotational trunk exercises on static and dynamic surfaces, resisted side steps, monster walks, PWB to FWB jumping Single-leg squats on BOSU, Single-leg BOSU balance with manual perturbation to trunk or ball, single-leg BOSU Romanian deadlift Agility <ul style="list-style-type: none"> Side shuffling, carioca, figure 8, zig-zags, resisted jogging (Sport Cord) in straight planes, backpedaling, ladder drills Plyometrics <ul style="list-style-type: none"> Single-leg hop downs from increasing height (up to 12" box), Single-leg hop-holds, Double and single-leg hopping onto unstable surface, Double and single-leg jump-turns, Repeated tuck jumps
Criteria to Return to Sport	<ul style="list-style-type: none"> <u>ROM</u>: full, pain free knee ROM, symmetrical with the uninvolved limb <u>Strength</u>: Isokinetic testing 90% or greater for hamstring and quad at 60°/sec and 300°/sec <u>Effusion</u>: No reactive effusion and ≤ 1+ with sport-specific activity <u>Weight Bearing</u>: normalized gait and jogging mechanics <u>Neuromuscular control</u>: appropriate mechanics and force attenuation strategies with high level agility, plyometrics, and high impact movements <u>Functional Hop Testing</u>: LSI 90% or greater for all tests <u>Physician Clearance</u>

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