

MULTIPLE LIGAMENT KNEE INJURIES (ACL-R AND MCL REPAIR) CLINICAL PRACTICE GUIDELINE

Progression is time and criterion-based, dependent on soft tissue healing, patient demographics and clinician evaluation. Contact Ohio State Sports Medicine at 614-293-2385 if questions arise. If your clinic does not have isokinetic equipment, please schedule test with Ohio State at 4 months post op.

Rehabilitation Precautions

Weightbearing Guidelines

- 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

ROM

- Avoid valgus and external rotation when performing knee flexion PROM
- Isotonic Strengthening
 - 40-90 degrees open-chained to avoid patellofemoral irritation
 - < 90 degrees closed-chained to avoid patellofemoral irritation

Meniscal Repair Considerations

- Refer to PT script for WB recommendations

MCL Lesion Site Considerations - Distal vs. Proximal or Midsubstance

- Distal: Cautious knee flexion ROM to allow healing and prevent long-term valgus laxity
- Proximal or Midsubstance: Accelerated knee flexion ROM to prevent scar formation and loss of functional ROM.



Weeks 0-2

ROM	<ul style="list-style-type: none"> • Begin active-assisted ROM (no forced flexion beyond 90° with meniscal repairs) <ul style="list-style-type: none"> ○ No aggressive towel stretching with hamstring autograft ○ Prone flexion ROM with 10# of varus thrust to protect MCL ○ No flexion ROM with distal MCL lesion • Patellar mobilization • Edema control
Strengthening	<ul style="list-style-type: none"> • Neuromuscular re-ed with stim and/or biofeedback if less then good quad set • Quad Sets • Flexion and abduction SLR, emphasis on eliminating extensor lag <ul style="list-style-type: none"> ○ Relax quad between reps to improve quality of quad contraction
Goals to Progress to Next Phase	<ol style="list-style-type: none"> 1. Good quad set 2. ROM 0-90 degrees (except with proximal MCL lesion) 3. 20 SLR with minimal to no extensor lag 4. Minimal to no edema

Weeks 2-4

ROM	<ul style="list-style-type: none"> • Begin ROM progression from active-assisted to active (no forced flexion beyond 90° with meniscal repairs) <ul style="list-style-type: none"> ○ Light towel stretching ○ Prone flexion ROM with varus support to protect MCL ○ ROM 0-40 for distal MCL lesion • Patellar mobilization • Edema control • Bike: Begin with ½ and progress to full revs per ROM precautions
Strengthening	<ul style="list-style-type: none"> • Neuromuscular re-ed with stim and/or biofeedback if warranted • Non-involved single leg balance with involved leg multidirectional hip (Reverse Steamboats) • SLR (multi-directional) without extensor lag • Shuttle <ul style="list-style-type: none"> ○ PWB bilateral to single-leg leg press per tolerance and good mechanics
Goals to Progress to Next Phase	<ol style="list-style-type: none"> 1. No antalgic gait without use of assistive devise 2. Good quad set 3. Able to stand on single-leg with moderate-good balance 4. No exacerbation with PWB strengthening



Weeks 4-6

ROM	<ul style="list-style-type: none"> • Continue as before (no forces flexion beyond 90°) • ROM 0-60 for distal MCL lesion • Prone flexion ROM with varus support to protect MCL • Exercise bike full revolutions for ROM and endurance
Strength	<ul style="list-style-type: none"> • Multi-angle straight leg raises • Single leg balance: progress to eyes closed • Single leg balance on involved with contralateral multidirectional hip (Steamboats) • Resisted side stepping • Step-ups progressed to step downs (heel touch) • Lunges in protected range • Progress PWB (shuttle, aquatics, Total Gym, etc) strengthening <ul style="list-style-type: none"> ◦ No jogging or single-leg plyos • Mini-Squats on unstable surface with UE assist if needed • Gait training if antalgic • Begin trunk and lumbosacral strengthening
Goals to Progress to Next Phase	<ol style="list-style-type: none"> 1. Normal quad set and gait 2. ROM 0-120° except with distal MCL lesions 3. No reactive effusion 4. Completion of exercises without exacerbation of symptoms 5. Complete reciprocal stair climbing

Weeks 6-10

ROM	<ul style="list-style-type: none"> • Continued with emphasis on terminal extension and pain-free flexion • Prone flexion ROM with varus support to protect MCL • ROM as tolerated for distal MCL lesion • Exercise bike for endurance
Strength	<ul style="list-style-type: none"> • Progress WB strengthening/stability/balance/proprioception exercise <ul style="list-style-type: none"> ◦ Lunges, shuttle, steamboats, side-stepping, leg press, step up/down, etc ◦ Begin sub-maximal leg extensions in protected range (see precautions above) ◦ Step downs (provide verbal and visual feedback for proper technique) • Begin with bilateral and progress to unilateral • Begin with 2" and progress step height per mechanics • No plyometric training • Begin bilateral shuttle jumping ≤ 50% body weight (shuttle, aquatics, Total Gym, etc) <ul style="list-style-type: none"> ◦ Continue to progress lumbosacral strengthening
Goals to Progress to Next Phase	<ol style="list-style-type: none"> 1. Increased strength/stability/proprioception with therapeutic exercise without exacerbation of symptoms 2. No reactive instability or effusion with WB activity

Weeks 10-12

ROM	<ul style="list-style-type: none"> • Knee flexion ROM • Continue with exercise bike and stretching
Strength	<ul style="list-style-type: none"> • Initiate isolated hamstring strengthening per tolerance • Initiate PWB jogging on shuttle • Progress LE and trunk strength and stability exercises • Progress step downs from 2-4" height • Emphasis on appropriate mechanics/avoid dynamic valgus

Weeks 12-16

ROM	<ul style="list-style-type: none"> • Continue per tolerance and pre-exercise warm-up
Strength	<ul style="list-style-type: none"> • Full weight bearing plyometrics <ul style="list-style-type: none"> ○ Progress from straight-plane to diagonal/rotation exercise • Strength progression stable to unstable surface <ul style="list-style-type: none"> ○ Emphasis on quad, hamstring and trunk dynamic stability • Shuttle <ul style="list-style-type: none"> ○ Rotational and single leg jumping • Initiate walk-jog progression <ul style="list-style-type: none"> ○ Criteria to initiate jogging <ul style="list-style-type: none"> • ≥ 7 /10 on #10 IKDC Questionnaire (Appendix A) • Complete single leg hop-downs without medial/lateral knee displacement • Normalized ROM • Audible rhythmic strike patterns and no gross visual antalgia
Goals to Progress to Next Phase	<ol style="list-style-type: none"> 1. ≥ 7 /10 on #10 IKDC Questionnaire - Appendix A 2. Complete plyometric/jogging activity without pain or dynamic instability 3. No reactive effusion 4. ROM 0-135 degrees <ul style="list-style-type: none"> • Begin agility exercises between 50-75% (utilize visual feedback to improve mechanics) <ul style="list-style-type: none"> ○ Side shuffling ○ Hopping ○ Carioca ○ Figure 8 ○ Zig-Zag ○ Resisted jogging(Sports Cord) in straight planes, etc

Months 4-8

ROM	<ul style="list-style-type: none"> Continue per tolerance and pre-exercise warm up
Strength	<ul style="list-style-type: none"> Emphasis on quad, hamstring and trunk dynamic stability Continue jogging progression FWB Plyometrics <ul style="list-style-type: none"> May begin single leg if no reactive instability Progress agility exercises between 75%-100% (utilize visual feedback to improve mechanics) – See above
Goals to Progress to Next Phase	<ol style="list-style-type: none"> Functional Test <ul style="list-style-type: none"> Single –leg and 3 cross-over hop test for distance (within 15% of uninvolved limb) – Appendix A Isokinetic Testing* <ul style="list-style-type: none"> Side to side symmetry isokinetic peak torque with knee extension and knee flexion (within 15% at 60°/sec, 180°/sec and 300°/sec) Quad to Hamstring isokinetic strength ratio $\geq 60\%$ Complete sport specific drills without exacerbation of symptoms or reactive instability

Months 8-12: Sports Specific Training

This sports specific phase should transition from the rehab specialist in the clinic to athletic trainer in the field as appropriate

Strength	<ul style="list-style-type: none"> Emphasis on quad, hamstring and trunk dynamic stability Continue sport-specific agility exercises (utilize visual feedback to improve mechanics) – See above <ul style="list-style-type: none"> Progress gradually to 100% per tolerance Emphasis on power and change of direction Utilize both indoor and outdoor surfaces
Goals to return to Sport	<ol style="list-style-type: none"> Physician clearance at 6-8 month check up Symmetry with functional testing (3 single-leg cross-over, etc) No reactive effusion or instability with sport-specific activity



Appendix A: IKDC Questionnaire

“How would you rank the function of your knee on the scale of 0 to 10 with 10 being normal, excellent function and 0 being the inability to perform an of your usual daily activities which may include sports?”

FUNCTION PRIOR TO YOUR KNEE INJURY

	0	1	2	3	4	5	6	7	8	9	10	
Couldn't perform daily activities												No limitation in daily activities

CURRENT FUNCTION OF YOUR KNEE

	0	1	2	3	4	5	6	7	8	9	10	
Couldn't perform daily activities												No limitation in daily activities

Functional tests

1. **Single hop for distance:** Have the subject line their heel up with the zero mark of the tape measure, wearing athletic shoes. The subject then hops as far as he can, landing on the same push off leg, for at least 3 seconds. The arms are allowed to move freely during the testing. Allow him to perform 4 practice hops on each leg. Then, have the subject perform 4 trials, recording each distance from the starting point to the back of the heel. Average the distances for each limb.
2. **Cross-over hop for distance:** This test is set up with a 15cm strip, extending 6 meters. The subject lines his heel up at the zero mark of the tape measure and hops 3 times on one foot, crossing over the center line each time. Each subject should hop as far forward as he can on each hop, but only the total distance hopped is recorded. Allow the subject to perform 4 practice rounds before recording. Average the distances for each limb.

Scoring

- Begin with the uninvolved leg. If using tape to mark distance, remove it before the next trial to minimize visual cues.
- Greater than a 15% difference in average distance between the right and left limbs should be cause for concern, indicating quad, and hamstring weaknesses that should be addressed prior to return to sport.
- If patient fails test, evaluate and implement appropriate strength/stability/balance exercise strategies. Once resolved, test again.

References

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