

MPFL Reconstruction Protocol

Phase 1: Immediate Post-Op (Weeks 0–3)

Rehabilitation Goals	<ul style="list-style-type: none"> • Decrease joint effusion • Protect the surgical repair • Knee ext \geq 0 • Mitigate effects of immobilization • Quad set with visible quad activity and superior patellar glide • Non-antalgic gait pattern (brace/crutch use will vary)
Precautions and Edu	<ul style="list-style-type: none"> • <i>Isolated MPFLR- WBAT with brace locked in full extension, ROM as tolerated MPFLR with TTO:</i> <ul style="list-style-type: none"> • NWB (0-1 week) > PWB with brace locked in full extension (1-3 weeks) • TKE as tolerated • Immobilized weeks 0-1, 0-90 weeks 1-3, ROM as tolerated after 3-weeks
Interventions	<ul style="list-style-type: none"> • Modalities: cryo-pneumatic compression (game ready), IFC/Premod, adjust brace (teach self) • MT/PROM: STM/edema massage, flx/ext with overpressure, patellar mobs • ROM/mobility: Heel slides, hamstring stretch, gastroc stretch, LLLD heel prop • Gait: Heel strike and step through pattern with least restrictive AD once weight bearing. Consider hurdles • Neuromotor: Quad set, SAQ, LAQ, SLR 4 ways (standing>on table), Hamstring curl, standing TKE, heel raises, weight shifting/narrow stance/tandem stance • NMES: Biphasic or Russian (consider home unit) • BFR: in the absence of significant effusion/edema, bruising, concern for DVT (use with NMES)
Progression Criteria	<ul style="list-style-type: none"> • $</=$3+ knee joint effusion via stroke test • Knee extension ROM \geq -5 degrees • Knee flexion ROM \geq 90 degrees • Normal patellar mobility, superior glide with quad contraction • Pt ambulating with least restricted AD/brace with min gait deviations • SLR with min quad lag at most

Phase 2: Early Rehab (Weeks 3–6)

Rehabilitation Goals	<ul style="list-style-type: none"> • Continue to decrease joint effusion o Progress active and passive TKE • Progress knee flexion ROM • No quad lag during SLR/LAQ • Discharge Crutches • Unlock and then wean out of brace
Precautions and Edu	<ul style="list-style-type: none"> • Precautions: <ul style="list-style-type: none"> • WBAT with and without TTO, should be FWB by 6-weeks • Unlocked/discharge brace, be purposeful with walking, continue wearing brace for longer bouts of walking, uneven surfaces or in busy public places <ul style="list-style-type: none"> • Based on quadriceps strength (10x SLR min quad lag to unlock) • Edu: Pushing into discomfort to return ROM, potential arthrofibrosis/cyclops lesion



Phase 2: Early Rehab (Weeks 3–6) (continued)

<p>Interventions</p> <p><i>*Continue with previous interventions as needed</i></p>	<ul style="list-style-type: none"> • Modalities/MT: per patient need, minimize effusion/ecchymosis • Gait/balance: <ul style="list-style-type: none"> • Circle/cone/hurdle walking, light sled push (bend and extend), side stepping, turning • Tandem walk, SLS, foam beams, foam pad, SL RDL • Therex: <ul style="list-style-type: none"> • Bike rocking, prone quad stretch, foot on step stretch, wall heel slides, manual OP emphasis on extension • Quad set towel under heel, TKE strap stretch, TKE ball wall > w/strap, standing TKE band resistance • Wall squat/sit, high box squat, step up ant/lat, lat heel tap > ant, SL heel raises, LAQ/hamstring w/BFR • Straight leg bridge, bridge, clamshell, hollow body holds, front plank > alt hip ext, banded side steps • Multitasking/reaction: catch/throw during LE activity, cognitive challenges • Conditioning: UBE or arms only Aerodyne
<p>Progression Criteria</p>	<ul style="list-style-type: none"> • <2+ knee joint effusion • Knee extension PROM >/= 0 • Knee flexion ROM >/= 110 degrees • Minimal gait deviations without AD or brace • Consistent SLR/LAQ without quad lag • Min-mod pain/limitations with functional activities/PT interventions

Phase 3: (Weeks 6–10)

<p>Rehabilitation Goals</p>	<ul style="list-style-type: none"> • Discharge brace, continue to protect repair • Collaborate with orthopedic team if significant ROM deficits/joint effusion persists • Progress flx/ext ROM • Assess hamstring strength • Initiate kneeling • Progress quad strength, initiate hamstring strengthening • Progress closed chain movement patterns
<p>Precautions</p>	<ul style="list-style-type: none"> • Gradual introduction of frontal and transverse plane movement patterns
<p>Interventions</p> <p><i>*Continue with previous interventions as needed</i></p>	<ul style="list-style-type: none"> • Modalities/MT: per patient need, encourage less reliance on cryotherapy and other passive modalities • Gait/Balance: <ul style="list-style-type: none"> • Walking w/catch+pass or dribble, high hurdles, hurdles on foam beam, hurdles/beam with catch+pass • Bosu balance > mini squat > step up, foam pad 3-way hip, SL RDL cone tap, SL RDL on pad • Therex: <ul style="list-style-type: none"> • Kneel flx stretch, quadruped/prayer stretch variations, kneeling on pad, half kneeling DF stretch • Box squat, air squat, kickstand squat, single leg wall squat, leg press, single leg press, weighted step ups, ant heel taps, sled pull, bridge hamstring curl, BFR leg press/weight bearing exercise if indicated • Hip hinge, RDL, dead lift from box • Plank on bosu/physioball, dead bug variations, monster walks, paloff press/cable chop variations
<p>Progression Criteria</p>	<ul style="list-style-type: none"> • <1+ knee joint effusion with progressions made • Normalize PROM flx/ext • Normalize TKE AROM • Quad/hamstring strength >/=4/5 (LSI)>/= 70% • No difficulty with ADLs (including stairs) • Good tolerance/performance of squat/lunge

Phase 4: (Weeks 10–16)	
Rehabilitation Goals	<ul style="list-style-type: none"> • Continue to progress quad/hamstring strengthening • Progress to controlled frontal/transverse/multiplanar loading • Progress aerobic conditioning • Involve gym program/strength and conditioning specialist • Progress kneeling activities • Prepare patient for plyometric activities
Precautions	<ul style="list-style-type: none"> • Impact activities ~week 10
Interventions <i>*Continue with previous interventions as needed</i>	<ul style="list-style-type: none"> • Therex: <ul style="list-style-type: none"> • Half kneeling hip flexor/adductor stretch, standing quad stretch, inch worms, light walking stretches • Machine resisted hamstring/quadriceps, 4-way slider lunge > curtsy step up > 4-way lunge > RFE split squat > 4-way heel tap, single leg squat to box > shrimp squat > unsupported single leg squat • Stability/speed prep: <ul style="list-style-type: none"> • Bosu lunge (forward/lateral), bosu med ball catch and pass, bosu med ball slams, bosu SL RDL, foam beam med ball slams, SLS unstable surface catch and pass • Shuttle kick back (slow > fast), med ball slam to mini squat (BL/UL), Split squat med ball slam, SL RDL row (slow > fast), SL RDL med ball throw • Aerobic conditioning: road bike, swimming, elliptical, stair master
Progression Criteria	<ul style="list-style-type: none"> • Trace/no knee joint effusion with progressions made • Quad/hamstring strength > /=4/5 (LSI> /= 80%) • Symmetrical squat/lunge

Phase 5: (4–5 months)	
Rehabilitation Goals	<ul style="list-style-type: none"> • Continue to progress quadriceps/hamstring strength • Introduce sagittal plane plyometrics • Introduce jogging/running • Prepare patient for interval running program • Initiate jump/hop testing
Criteria for Plyometrics	<ul style="list-style-type: none"> • ROM WNL • Trace effusion at most • Min anterior knee pain with loading • Strength: Symmetrical squat/lunge, 10x shrimp squats to at least 60 degrees, 10x ant heel tap on 6-8" with minimal compensatory patterns
PWB Plyometrics	<ul style="list-style-type: none"> • Single plane and PWB (on shuttle or with band assistance) • < /= 100 foot contacts initially • 1-2 sessions per week, 5-10% progression of foot contacts per week
Sagittal Plyometrics	<ul style="list-style-type: none"> • PWB > box jump up > box jump down > 2 to 1 box jump > in place jumps > scissor hops > in place jog > line jumps > line hops > single leg box jumps > squat jumps > sagittal plane ladder drills > jogging
Frontal Plane Plyometrics	<ul style="list-style-type: none"> • PWB > lateral box jumps > single leg lateral box jumps > lateral line jumps > lateral line hops > Frontal plane ladder drills > lateral shuffling
Hop Testing	<ul style="list-style-type: none"> • Single hop for distance, triple hop for distance, crossover hop for distance, 6m hop for time
Progression Criteria	<ul style="list-style-type: none"> • No effusion with progressions made • Good tolerance and performance of plyometric activities • Good tolerance and performance of jogging/running • > /= 70% hop testing LSI • Quad/hamstring strength > /= 4+/5 (LSI> /=85%)



Phase 7: (5–6 months)	
Rehabilitation Goals	<ul style="list-style-type: none"> • Continue to progress quadriceps/hamstring strength • Initiate interval running program • Initiate cutting/pivoting/agility • Initiate sprinting • Transition to self-management/strength and conditioning
Return to Run	<ul style="list-style-type: none"> • 1 mile ~1500 foot contacts, initiate interval program once pt demonstrates tolerance to this foot contact volume as well as 30-minute walk without pain/effusion • Further clearance via metronome set to 60-90BPM, complete heel tap to this cadence • Cue against asymmetrical running pattern due to decreased load acceptance (decreased knee flexion angle) on affected limb • See return to run protocol for volume progression
Agility	<ul style="list-style-type: none"> • Change of direction, multiplanar movements, cutting, pivoting • Progress to multiplanar ladder drills and cone drills • Reaction activities, buddy exercises, sport specific drills • Track progress with T-drill and 5-10-5
Sprinting	<ul style="list-style-type: none"> • See return to sprinting protocol
Progression Criteria	<ul style="list-style-type: none"> • No effusion with progressions made • Good tolerance and performance of interval running program • Good tolerance and performance of agility exercises • Good tolerance and performance of interval sprinting program • Hop testing LSI \geq 80% • Quad/hamstring strength LSI \geq 90% • ACL RSI \geq 60% at 6 months

Phase 8: (6+ months)	
Return to Sport Criteria	<ul style="list-style-type: none"> • Quadriceps/hamstring strength LSI 90-100% • Hop testing LSI 90-100% • ACL RSI \geq 70% • Restore pre-injury conditioning/performance • Return to sport specific activities: non-contact practice, full practice, full play • Competitive play at 6+ months