Rehabilitation Protocol for Meniscal Repair

The intent of this physical therapy protocol is to provide the clinician with a guideline of the post-operative rehabilitation course of a patient who has undergone a Meniscal Repair with Ortho Rhode Island. It is by no means intended to be a substitute for one's clinical decision making regarding the progression of a patient's postoperative course based on their physical exam/findings, individual progress, and/or the presence of post-operative complications. If a clinician requires assistance in the progression of a post-operative patient, the clinician should consult with the referring surgeon.

Phase 1: Immediate Post-Op (Weeks 0–1) PT appointments begins 3–5 days after surgery, and then approx. 1–2x/week	
Rehabilitation Goals	• Decreased joint effusion • Protect repair • Knee ext ROM>/= 0 • Gradually improve knee flexion ROM • Quad set with visible quad activity and superior patellar glide • Non-antalgic gait pattern
Brace	• Locked in extension when weight bearing for 4 weeks • Unlocked 0-30 weeks 4-6, progress weight bearing ROM gradually 6+ weeks
Precautions and Edu	• </= 90 degrees of knee flexion until 2-weeks then progress as tolerated • Avoid hamstring contraction until 6-weeks post-op
Interventions	**Modalities:** cryo pneumatic compression (game ready), IFC/Premod, adjust brace **MT/PROML:** STM/edema massage, flx/ext with overpressure, patellar mobs (teach self) **ROM/mobility:** Heel slides, hamstring stretch, gastroc stretch, LLLD heel prop **Gait:** Step through pattern regardless of AD **Neuromotor:** Quad set, multiangle knee ext isometrics, SLR, heel raises, weight shifting/narrow stance/tandem stance **NMES:** Daily, Biphasic or Russian (consider home unit) **BFR:** in the absence of significant effusion/edema, bruising, concern for DVT (use with NMES)
Criteria to Progress	• </=3+ knee joint effusion via stroke test • Knee extension ROM: 0 degrees • Knee flexion ROM: 90 degrees • Normal patellar mobility, superior glide with quad contraction • Pt ambulating with least restrictive AD (gait will be abnormal until brace is unlocked) • SLR with min quad lag at most

Phase 2: Early Rehab (Weeks 2–4)	
Rehabilitation Goals	• Continue to protect repair • Continue to decrease joint effusion • Progress active and passive TKE • Progress knee flexion ROM • No quad lag during SLR/LAQ • Discharge Crutches
Precautions and Edu	• Precautions: Continue with previous precautions; however, progress flexion ROM as tolerated • Edu: Pushing into discomfort to return ROM, potential arthrofibrosis/cyclops lesion

Phase 2: Early Rehab (Weeks 2–4) (continued)	
Interventions	**Modalities/MT:** per patient need, minimize effusion/ecchymosis **Gait/balance:** Tandem walk, SLS, foam beams, foam pad, SL RDL, NWB step taps **Therex:** • Bike rocking, prone quad 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 • Band resisted 4-way SLR (standing > table), multi-hip machine all planes, SL heel raises, SAQ > LAQ>BFR • Straight leg 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
Criteria to Progress	• <2+ knee joint effusion via stroke test • Knee extension PROM >/= 0 • Knee flexion ROM >/= 110 degrees • Consistent SLR/LAQ without quad lag • Min-mod pain/limitations with functional activities/Pt interventions

Phase 3: (Weeks 4–6)	
Rehabilitation Goals	• Continue to protect repair • Knee flexion nearing normal limits • Assess gait pattern brace unlocked • Assess quad strength • Initiate closed chain movement patterns with brace unlocked
Precautions	• Unlock brace to 30 degrees of knee flexion for weight bearing at 4 weeks. • Discharge/weaning out of brace by 6-weeks • SLRx10 without quad lag and good tolerance to functional progressions in locked brace
Interventions	**Modalities/MT:** per patient need, encourage less reliance on cryotherapy and other passive modalities **Gait/Balance:** • Circle/cone/hurdle walking, light sled push (bend and extend), side stepping, turning • Walking w/catch+pass or dribble, hurdles on foam beam, hurdles/beam with catch+pass • SLS pass/catch, SLS foam pad 3-way hip, SL RDL on pad **Therex:** • Full revs on bike, standing hip flexor stretch, standing hip adductor stretch • Wall squat/sit, high box squat, step up ant/lat, lat heel tap > ant
Criteria to Progress	• </=1+ knee joint effusion • Passive knee ext WNL, active TKE nearing normal • Flexion ROM>/= 90% contralateral limb • Quad strength>/= 3+/5 • Min gait deviations • Min difficulty/pain with ADLs (including stairs) • Discharge brace

Phase 4: (Weeks 6–10 weeks)	
Rehabilitation Goals	• 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
Precautions	• Progressively introduce closed chain knee flexion ~10 degrees per week
Interventions	**Modalities/MT:** majority of passive modalities should be discontinued by this phase **Gait/Balance:** High hurdles, bosu balance > mini squat > step up, SL RDL cone tap **Therex:** • Foot on step stretch, kneel flx stretch, quadruped/prayer stretch variations, kneeling on pad, half kneeling DF stretch • Standing hamstring curl, prone hamstring curl, ankle weight LAQ, ankle weight hamstring curl • ¼ split squat > retro slider lunge > split squat • Dead lift from ground, lift and carry, farmer's carry, chaos carry, waiter's carry • Bridge hamstring curl eccentric > full > SL, plank on ball, side plank, adductor side plank **Aerobic conditioning:** Aquatic program
Criteria to Progress	• Trace 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 5: (Weeks 10–16)	
Rehabilitation Goals	• 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	• Impact activities ~week 10
Interventions	**Therex:** • 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:** • 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
Criteria to Progress	• Trace/no knee joint effusion with progressions made • Quad/hamstring strength >/=4/5 (LSI>/= 80%) • Symmetrical squat/lunge

Phase 6: (4–5 months)	
Rehabilitation Goals	• 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	• 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	• 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	• 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	• PWB > lateral box jumps > single leg lateral box jumps > lateral line jumps > lateral line hops > Frontal plane ladder drills > lateral shuffling
Hop Testing	• Single hop for distance, triple hop for distance, crossover hop for distance, 6m hop for time
Criteria to Progress	• 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	• 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	• 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	• 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	• See return to sprinting protocol
Criteria to Progress	• 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>/= 80% • Quad/hamstring strength LSI>/=90% • ACL RSI>/=60% at 6 months

Phase 8: (6+ months)	
Return to Sport Criteria	• Quadriceps/hamstring strength LSI 90-100% • Hop testing LSI 90-100% • ACL RSI>/= 70% • Restore pre-injury conditioning/performance • Return to sport specific activities- non-contact practice, full practice, full play • Competitive play at 6+ months