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REHABILITATION PROTOCOL: Arthroscopic Partial Meniscectomy

This protocol is intended to guide clinicians through the post-operative course for Arthroscopy Partial Meniscectomy. This protocol is time based (dependent on tissue healing) as well as criterion based. Specific intervention should be based on the needs of the individual and should consider exam findings and clinical decision making. The timeframes for expected outcomes contained within this guideline may vary based on surgeon’s preference, additional procedures performed, and/or complications. If a clinician requires assistance in the progression of a post-operative patient, they should consult with the referring surgeon.

The interventions included within this protocol are not intended to be an inclusive list. Therapeutic interventions should be included and modified based on the progress of the patient and under the discretion of the clinician.

Post-operative considerations

If you develop a fever, intense calf pain, excessive drainage from the incision, uncontrolled pain or any other symptoms you have concerns about you should call your doctor.

PHASE I: IMMEDIATE POST-OP (DAYS 0-7 AFTER SURGERY)

Rehab Goals	<ul style="list-style-type: none"> ▪ Reduce swelling, minimize pain ▪ Restore knee range of motion (ROM) ▪ Re-establish quadriceps activation ▪ Patient Education: <ul style="list-style-type: none"> ○ Keep your knee straight and elevated when sitting or lying down. Do not rest with a towel placed under the knee ○ Avoid painful activities ○ Limit excessive walking
Weight Bearing	<p>Walking</p> <ul style="list-style-type: none"> ▪ Weight bearing as tolerated with crutches ▪ Weaning from crutches may occur in the first several days depending on appropriate resolution of edema, achievement of excellent quad activation (evidenced by ability to perform SLR), and proper gait pattern under the guidance of the physical therapist

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	<ul style="list-style-type: none"> ▪ When climbing stairs, lead with non-surgical limb and when going down the stairs, lead with the surgical limb
Interventions	<p>Swelling Management</p> <ul style="list-style-type: none"> ▪ Ice, compression, elevation ▪ Retrograde massage ▪ Ankle pumps <p>Range of motion/Mobility</p> <ul style="list-style-type: none"> ▪ Patellar mobilizations: superior/inferior and medial/lateral ▪ Heel slides with towel ▪ Low intensity, long duration extension stretches: prone hang, heel prop ▪ Seated gastrocnemius and hamstring stretch ▪ Stationary bike <p>Strengthening</p> <ul style="list-style-type: none"> ▪ Quad sets ▪ Calf raises ▪ Hip abduction ▪ Straight leg raise ▪ Sidelying Clamshell ▪ Include NMES as needed: NMES high intensity (2500 Hz, 75 bursts) supine knee extended 10 sec/50 sec, 10 contractions, 2x/week during sessions—use of clinical stimulator during session, consider home units distributed immediate post op, can also include functionally into above
Criteria to Progress	<ul style="list-style-type: none"> ▪ Knee ROM of 0 →90 deg ▪ Ability to perform SLR (straight leg raise) with appropriate quadriceps activation

PHASE II: INTERMEDIATE POST-OP (DAY 8 – WEEK 2 AFTER SURGERY)

Rehab Goals	<ul style="list-style-type: none"> ▪ Achieve full pain free ROM ▪ Restore muscular strength and endurance ▪ Gradual return to functional activities while monitoring symptoms response ▪ Restore normal gait without assistive device ▪ Improve balance and proprioception
Weight Bearing	<ul style="list-style-type: none"> ▪ Weight bearing as tolerated <ul style="list-style-type: none"> ○ Goal to discharge assistive devices
Additional Interventions *Continue with Phase I interventions	<p>Range of motion/Mobility</p> <ul style="list-style-type: none"> ▪ Stretching of all muscle groups: prone quad stretch, standing quad stretch, standing hip flexor stretch <p>Strengthening</p> <ul style="list-style-type: none"> ▪ Standing hamstring curls

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	<ul style="list-style-type: none"> ▪ Step ups and step ups with march ▪ Partial squats ▪ Wall slides, ball squats ▪ Lumbopelvic strengthening: bridge & unilateral bridge, bridges on physioball, bridges on physioball with roll-in ▪ Heel raises ▪ Leg press/shuttle press machine <p>Balance/proprioception</p> <ul style="list-style-type: none"> ▪ Single leg standing balance (knee slightly flexed) static progressed to unsteady surface
Criteria to Progress	<ul style="list-style-type: none"> ▪ Full and pain free knee ROM ▪ No swelling (Modified Stroke Test) ▪ Symmetrical, non-antalgic gait pattern without assistive device

PHASE III: LATE POST-OP (2-8 WEEKS AFTER SURGERY)

Rehab Goals	<ul style="list-style-type: none"> ▪ Maintain full and pain free knee ROM ▪ Enhance muscle strength and endurance ▪ Avoid post exercise pain/swelling ▪ Promote proper movement patterns
Weight Bearing	<ul style="list-style-type: none"> ▪ FWB
Additional Interventions *Continue with Phase I-II Interventions	<p>Range of motion/Mobility</p> <ul style="list-style-type: none"> ▪ Patella mobilizations: superior/inferior and medial/lateral ▪ Stretching of all muscle groups: prone quad stretch, standing quad stretch, standing hip flexor stretch ▪ Stationary Bicycle <p>Cardio</p> <ul style="list-style-type: none"> ▪ 4-6 weeks, as tolerated: Elliptical, stair climber, flutter kick swimming, pool jogging <p>Strengthening</p> <ul style="list-style-type: none"> ▪ Gym equipment: <ul style="list-style-type: none"> ○ Leg press machine ○ Standing hip abductor and adductor machine ○ Hip extension machine ○ Roman chair ○ Seated calf machine ▪ Progress intensity (strength) and duration (endurance) of exercises <p>**The following exercises to focus on proper control with emphasis on good proximal stability</p>

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	<ul style="list-style-type: none"> ▪ Lateral step down ▪ Squat to chair ▪ Lateral lunges ▪ Romanian deadlift and Single leg deadlift ▪ Single leg progression: partial weight bearing single leg press, slide board lunges: retro and lateral, step ups and step ups with march, split squats, lateral step-ups, step downs, single leg squats, single leg wall slides <p>Balance/proprioception</p> <ul style="list-style-type: none"> ▪ Progress single limb balance including perturbation training ▪ Lower quarter reaches (Y-Balance and Star drill) <p>**When Quadriceps index > 80% strength:</p> <ul style="list-style-type: none"> ▪ Interval running program <ul style="list-style-type: none"> ○ Return to Running Program ▪ Progress to plyometric and agility program <ul style="list-style-type: none"> ○ Agility and Plyometric Program
Criteria to Progress	<ul style="list-style-type: none"> ▪ No swelling/pain after exercise ▪ Ability to perform ADLs pain free <p>**If patient is returning to impact activities:</p> <ul style="list-style-type: none"> ▪ 10 repetitions single leg squat proper form through at least 60 deg knee flexion ▪ Drop vertical jump with good control ▪ Completion of jog/run program without pain/swelling ▪ Functional Assessment <ul style="list-style-type: none"> ○ Quadriceps index >80%; HHD mean preferred (isokinetic testing if available) ○ Hamstring, glut med, glut max index ≥80%; HHD mean preferred (isokinetic testing for HS if available) ○ Single leg hop test ≥75% compared to contra lateral side

PHASE IV: UNRESTRICTED RETURN TO SPORT (9-12 WEEKS AFTER SURGERY)

Rehab Goals	<ul style="list-style-type: none"> ▪ Maintain full ROM ▪ Safely progress strengthening ▪ Promote proper movement patterns ▪ Avoid post exercise pain/swelling ▪ Return to all necessary and desired functional activities, work duties, and athletic activities
Additional Interventions *Continue with	<ul style="list-style-type: none"> ▪ Multi-plane sport specific plyometrics program ▪ Multi-plane sport specific agility program ▪ Include hard cutting and pivoting depending on the individuals' goals

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Phase II-III interventions	
Return to Sport	<ul style="list-style-type: none"> ▪ Functional Assessment <ul style="list-style-type: none"> ○ Quadriceps index >95%; HHD mean preferred (isokinetic testing if available) ○ Hamstring, glut med, glut max index ≥95%; HHD mean preferred (isokinetic testing for HS if available) ○ Single leg hop test ≥95% compared to contra lateral side with proper landing mechanics ▪ KOOS-sports questionnaire >90%, or other PRO as indicated

**Acknowledgement: This rehab protocol was largely adopted from the protocols at MGH Sports Medicine Physical Therapy, which can be found at <https://www.massgeneral.org/orthopaedics/sports-medicine/physical-therapy/sports-rehab-protocols>*

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Return to Running Program

This program is designed as a guide for clinicians and patients through a progressive return-to-run program. Patients should demonstrate > 80% on the Functional Assessment prior to initiating this program (after a knee ligament or meniscus repair). Specific recommendations should be based on the needs of the individual and should consider clinical decision making. If you have questions, contact the referring physician.

PHASE I: WARM UP WALK 15 MINUTES, COOL DOWN WALK 10 MINUTES Day 1 2 3 4 5 6

Day	1	2	3	4	5	6	7
Week 1	Walk 5 min, Jog 1 min x 5 reps		Walk 5 min, Jog 1 min x 5 reps		Walk 4 min, Jog 2 min x 5 reps		Walk 4 min, Jog 2 min x 5 reps
Week 2		Walk 3 min, Jog 3 min x 5 reps		Walk 3 min, Jog 3 min x 5 reps		Walk 2 min, Jog 4 min x 5 reps	
Week 3	Walk 2 min, Jog 4 min x 5 reps		Walk 1 min, Jog 5 min x 5 reps		Walk 1 min, Jog 5 min x 5 reps		Return to Run

**Only progress if there is no pain or swelling during or after the run

PHASE II: WARM UP WALK 15 MINUTES, COOL DOWN WALK 10 MINUTES

Day	1	2	3	4	5	6	7
Week 1	20 min		20 min		20 min		25 min
Week 2		25 min		25 min		30 min	

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Week 3	30 min		30 min		35 min		35 min
Week 4		35 min		40 min		40 min	
Week 5	40 min		45 min		45 min		45 min
Week 6		50 min		50 min		50 min	
Week 7	55 min		55 min		55 min		60 min
Week 8		60 min		60 min			

Recommendations

- Runs should occur on softer surfaces during Phase I
- Non-impact activity on off days
- Goal is to increase mileage and then increase pace; avoid increasing two variables at once
- 10% rule: no more than 10% increase in mileage per week

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Agility and Plyometric Program

This program is designed as a guide for clinicians and patients through a progressive series of agility and plyometric exercises to promote successful return to sport and reduce injury risk. Patients should demonstrate > 80% on the Functional Assessment prior to initiating this program. Specific intervention should be based on the needs of the individual and should consider clinical decision making. If you have questions, contact the referring physician.

PHASE I: ANTERIOR PROGRESSION

Rehab Goals	<ul style="list-style-type: none"> ▪ Safely recondition the knee ▪ Provide a logical sequence of progressive drills for pre-sports conditioning
Agility	<ul style="list-style-type: none"> ▪ Forward run ▪ Backward run ▪ Forward lean in to a run ▪ Forward run with 3-step deceleration ▪ Figure 8 run ▪ Circle run ▪ Ladder
Plyometrics	<ul style="list-style-type: none"> ▪ Shuttle press: Double leg alternating leg single leg jumps ▪ Double leg: <ul style="list-style-type: none"> ○ Jumps on to a box jump off of a box jumps on/off box ○ Forward jumps, forward jump to broad jump ○ Tuck jumps ○ Backward/forward hops over line/cone ▪ Single leg (these exercises are challenging and should be considered for more advanced athletes): <ul style="list-style-type: none"> ○ Progressive single leg jump tasks ○ Bounding run ○ Scissor jumps ○ Backward/forward hops over line/cone
Criteria to Progress	<ul style="list-style-type: none"> ▪ No increase in pain or swelling ▪ Pain-free during loading activities ▪ Demonstrates proper movement patterns

PHASE II: LATERAL PROGRESSION

Rehab Goals	<ul style="list-style-type: none"> ▪ Safely recondition the knee ▪ Provide a logical sequence of progressive drills for the Level 1 sport athlete
Agility	<ul style="list-style-type: none"> ▪ Side shuffle ▪ Carioca ▪ Crossover steps

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*Continue with Phase I interventions	<ul style="list-style-type: none"> ▪ Shuttle run ▪ Zig-zag run ▪ Ladder
Plyometrics *Continue with Phase I interventions	<ul style="list-style-type: none"> ▪ Double leg: <ul style="list-style-type: none"> ○ Lateral jumps over line/cone ○ Lateral tuck jumps over cone ▪ Single leg (these exercises are challenging and should be considered for more advanced athletes): <ul style="list-style-type: none"> ○ Lateral jumps over line/cone ○ Lateral jumps with sport cord
Criteria to Progress	<ul style="list-style-type: none"> ▪ No increase in pain or swelling ▪ Pain-free during loading activities ▪ Demonstrates proper movement patterns

PHASE III: MULTIPLANAR PROGRESSION

Rehab Goals	<ul style="list-style-type: none"> ▪ Challenge the Level 1 sport athlete in preparation for final clearance for return to sport
Agility *Continue with Phase I-II interventions	<ul style="list-style-type: none"> ▪ Box drill ▪ Star drill ▪ Side shuffle with hurdles
Plyometrics *Continue with Phase I-II interventions	<ul style="list-style-type: none"> ▪ Box jumps with quick change of direction ▪ 90 and 180 degree jumps
Criteria to Progress	<ul style="list-style-type: none"> ▪ Clearance from MD ▪ Functional Assessment <ul style="list-style-type: none"> ○ Quad/HS/glut index $\geq 90\%$ contra lateral side (isokinetic testing if available) ○ Hamstring/Quad ratio $\geq 70\%$ ○ Hop Testing $\geq 90\%$ contralateral side ▪ KOOS-sports questionnaire $>90\%$ ▪ International Knee Committee Subjective Knee Evaluation >93 ▪ Psych Readiness to Return to Sport (PRRS)