

Physical Therapy Protocol: Arthroscopic Meniscus Bucket Handle Repair (Inside-Out)

Phase 1: Weeks 0 through 6 – Meniscus Repair Protection

Physician Goals: Protect the meniscus repair which is at its most vulnerable during this time, decrease pain, prevent significant stiffness

Restrictions: Nonweightbearing with hinged knee brace on and locked in full extension, range of motion 0 to 90° when nonweightbearing, brace locked in full extension for sleep and when moving around

Exercises: Patella mobilization, quad sets with brace locked at 0°, straight leg raises with brace locked in full extension until quad control is good, then straight leg raises unlocked, heel slides, ankle pumps, body weight core strengthening, isometric knee extensions (90-45°), no-load full-ROM knee extensions, progress to weighted knee extensions (1-2 lbs increments; must be pain free), BFR at 100% LOP, 5-minute occlusion, 3-minute reperfusion cycles - no exercise required during this phase. Focus on mitigating muscle atrophy. NMES during OKC exercises Parameters: 2-second ramp-up, 10-second contraction, 50-second rest

Total Visits: 12 – once to twice per week with daily at home range of motion exercises, quad sets, ankle pumps

Phase 2: Weeks 6 through 12 – Range of Motion Recovery

Physician Goals: Regain full range of motion, begin to build lower extremity strength and endurance while minimizing impact, discontinue brace and crutches completely

Restrictions: Transition to weight bearing as tolerated, no weight bearing with the knee beyond 90° of flexion, no running, jumping, cutting, or pivoting

Exercises: Short arc squats/weight shifts, start proprioceptive training, initiate step-up program and progress to step-down program, leg press observing weight bearing ROM restriction, isotonic knee extensions, stationary bike with low resistance, retrograde treadmill ambulation, advance hip/core/glute strengthening; continue BFR with OKC exercises at 80% LOP, 30-15-15-15 rep scheme with gradual progression to 20-30% 1 rep max resistance. NMES with advanced resistance exercises. Adjust intensity as needed for strength recovery; ensure proper patient comfort, pool therapy / aquatic cardio OK at this point

Total Visits: 12 – once to twice per week depending on patient's ability to perform HEP independent of PT sessions

Phase 3: Weeks 12+ – Strength Recovery and Return to Activity

Physician Goals: Increase strength throughout the entire range of motion without restrictions, gradually resume impact activity and return to recreation/sports

Restrictions: Return to running, cutting/agility work, and sports per criteria below

Exercises: Progress lower extremity strengthening without restrictions, plyometric program, stationary bike with low resistance first, then increase; swimming OK at this phase

Total Visits: 24 – once to twice per week depending on patient's ability to perform strength training independently – goal is strengthening 3-4x per week

Return to Running Criteria:

- Trace effusion, flexion within 5° of contralateral side
- Limb symmetric index (LSI) on anterior reach Y balance test $\geq 90\%$
- LSI on quadriceps torque output on isometric measurement $\geq 75\%$
- 12" single leg squat tolerance with good hip control
- Able to walk > 1 mile with no limping or pain
- Able to "hop" with upper extremity assistance on operative leg 5 times without pain or compensation
- Single leg balance with eyes closed ≥ 30 seconds

Return to Cutting / Agility Training Criteria:

- Return to running criteria met above
- No effusion
- Full range of motion
- Quad LSI on isokinetic $\geq 85\%$
- Hamstring LSI on isokinetic $\geq 85\%$
- LSI on anterior reach Y-balance $\geq 95\%$
- Single leg hopping pain free

Return to Sport Criteria:

- LSI $\geq 95\%$ hamstring curl and leg press
- Able to perform single leg squat to 75° with correct form
- Single leg hop LSI $\geq 95\%$
- Y-balance $\geq 95\%$ (mean of 3 trials in anterior, posterolateral and posteromedial $\div 100$)
- Vertical jump test, single leg hop distance, and timed single leg hop over 20 feet $\geq 90\%$ contralateral side