



Orthopedic Surgery, Sports Medicine & Arthroscopy Specialists

Jonathan Watson, MD

REHABILITATION PROTOCOL- Meniscus transplant

The rehabilitation guidelines are presented in a criterion based progression program. General time frames are given for reference to the average, but individual patients will progress at different rates depending on their age, associated injuries, pre-injury health status, rehab compliance, tissue quality and injury severity. Specific time frames, restrictions, and precautions may also be given to protect healing tissues and the surgical repair/reconstruction. It should not be a substitute for one's clinical decision making regarding the progression of a patient's post-operative course based on their physical exam findings, individual progress, and/or the presence of post-operative complications. The therapist should consult the referring physician with any questions or concerns.

Special attention must be given to impairments that caused the initial problem. For example, if the patient is s/p partial medial meniscectomy and they have a varus alignment, post-operative rehabilitation should include correcting muscle imbalances or postures that create medial compartment stress.

INDIVIDUAL CONSIDERATIONS: S/p

PHASE 1- Surgery to 2 weeks

REHAB GOALS	<ol style="list-style-type: none"> 1. Protection of the post-surgical repair 2. Full passive knee extension and flexion to: 90 degrees (medial meniscus), 70 degrees (lateral meniscus) 3. Restore leg control – no lag with straight-leg-raise 4. Safe crutch walking 5. Eliminate effusion/swelling
PRECAUTIONS	<ol style="list-style-type: none"> 1. Crutches and non-weight bearing with brace locked in extension. Brace flexion limited to 90 degrees for medial and 70 degrees for lateral. 2. Brace on for sleep for 3 weeks, afterwards can remove for sleep and bathing. 3. Cryocuff 3-5 times per day for 20 minutes and ice after every therapy session
RANGE OF MOTION EXERCISES	<ul style="list-style-type: none"> ○ Heel props, prone hangs for passive knee extension ○ Patellar mobilization- superior/inferior and medial/lateral ○ Passive knee flexion, active/active assist knee extension (limit to 90 to 30 deg) ○ Hamstring & calf stretches
SUGGESTED THERAPEUTIC	<ul style="list-style-type: none"> ○ Quad sets ○ SLRs in 4 planes as tolerated, begin with flexion only, when no

EXERCISES	<p>extensor lag progress to 4 plane.</p> <ul style="list-style-type: none"> ○ Calf pumps, ankle strengthening exercises ○ Gait training with crutches ○ NMES as tolerated
CARDIOVASCULAR EXERCISE	Upper body circuit training or UBE.
PROGRESSION CRITERIA	<ul style="list-style-type: none"> ○ Straight leg raise without extension lag ○ No effusion ○ Knee flexion to 90 degrees (70 degrees for lateral) and full extension ○ Good patellar mobility

PHASE 2- 3-6weeks

REHAB GOALS	<ol style="list-style-type: none"> 1. Protection of the post-surgical repair 2. Restore knee range of motion – full knee extension and Knee flexion 3. Regain quadriceps control 4. Minimize pain and swelling 5. Begin closed chain exercises, progress balance & proprioceptive training
PRECAUTIONS	<ol style="list-style-type: none"> 1. Crutches and non-weight bearing until week 4. Toe touch weight bearing weeks 4-6. Brace flexion limited to 90 degrees for medial and 70 degrees for lateral until week 3, then progress as tolerated. 2. Continue brace for ambulation, can unlock. 3. Cryocuff 3-5 times per day for 20 minutes and ice after every therapy session
RANGE OF MOTION EXERCISES	<ul style="list-style-type: none"> ○ Calf, IT band, hip flexor and hamstring stretches ○ Patellar mobilizations ○ Passive knee flexion- no limitation after week 3
SUGGESTED THERAPEUTIC EXERCISES	<ul style="list-style-type: none"> ○ Quad sets, multiangle quad isometrics ○ SLRs in all planes, add ankle weights <10% of body wt at 6 weeks ○ Knee extension- active/active assist (limit 90-30 for anterior horn) ○ Calf pumps, ankle strengthening exercises ○ Week 6- hip/gluteal strengthening, short arc quad/VMO strengthening
CARDIOVASCULAR EXERCISE	Upper body circuit training (seated), core strengthening or UBE
PROGRESSION CRITERIA	<ul style="list-style-type: none"> ○ Straight leg raise in all 4 planes without extension lag ○ No effusion ○ Full knee range of motion

	<ul style="list-style-type: none"> ○ Normal patellar mobility
--	--

PHASE 3- 7-12 weeks postop

REHAB GOALS	<ul style="list-style-type: none"> ○ Maintain full ROM ○ Improve quad strength & endurance ○ Progress functional activities, balance, proprioception ○ Progress to normal gait
PRECAUTIONS	<ul style="list-style-type: none"> ○ Progress to weight bearing as tolerated with brace at week 7. Use 2 crutches initially and wean. Patient should be ambulating without crutches by end of week 8. ○ Discontinue brace at week 8 if good quad control. ○ No impact activities or plyometrics ○ Avoid posterior knee pain with deep flexion exercise ○ Avoid single leg squats
RANGE OF MOTION EXERCISES	<ul style="list-style-type: none"> ○ Continue exercises from phase 2. ○ Can add hip ROM, avoid torque on knee joint with hip ER/IR
SUGGESTED THERAPEUTIC EXERCISES	<ul style="list-style-type: none"> ○ Continue phase 2 exercises ○ Straight leg raises in 4 planes, minisquats (0-45) can add rubber tubing ○ Hamstring curls ○ Knee extension, active 90-30 deg ○ Hip & gluteal strengthening ○ Leg press 70-10 deg ○ 2 legged balance board ○ Lateral step ups (5-10cm block) ○ Resisted gait training ○ Upper body & core strengthening
CARDIOVASCULAR EXERCISE	<p>Non-impact endurance training: stationary bike (high seat low tension), elliptical and stairmaster at week 7. Pool walking Stairmaster, Nordic trak, swimming with straight leg kick at week 9</p>
PROGRESSION CRITERIA	<ul style="list-style-type: none"> ○ Normal gait on all surfaces without assistive device ○ Able to perform ADLs without problem ○ Full, painless range of motion

PHASE 4- 13-26 weeks postop

REHAB GOALS	Improve muscle strength & endurance Progress functional activity
PRECAUTIONS	Post-activity soreness should resolve within 24 hours Avoid post activity swelling Avoid posterior knee pain with deep flexion exercise Avoid single leg squats
RANGE OF MOTION EXERCISES	Continue with flexibility exercises
SUGGESTED THERAPEUTIC EXERCISES	<ul style="list-style-type: none"> ○ Progress phase 3 activities with resistance/weight ○ Progress balance and proprioceptive exercises from Phase 3 to single leg stance, unstable platform
CARDIOVASCULAR EXERCISE	Stationary bike (high seat), pool walking, swimming (straight leg kick), stairmaster, nordik trak, elliptical.
PROGRESSION CRITERIA	<ul style="list-style-type: none"> ○ Full range of motion ○ Able to walk 10 min without pain

PHASE 5- 27+ weeks

REHAB GOALS	Progress functional activity & strengthening Balance & hamstring and quad strength within 10% of contralateral Return to sport
PRECAUTIONS	Post-activity soreness should resolve within 24 hours Avoid post activity swelling
RANGE OF MOTION EXERCISES	Continue with flexibility exercises
SUGGESTED THERAPEUTIC EXERCISES	<ul style="list-style-type: none"> ○ Progress strengthening from phase 4, maintain ROM limits on strengthening exercises ○ Progress balance/proprioception from phase 4 ○ One year- Plyometrics: must have completed running program, level surface box hops, double leg hops (land in flexion), single leg hops, vertical box hops. ○ One year- Agility, sport specific: cutting, carioca, figure 8 if tolerated. Begin at low speed and progress as tolerated. Need 80% strength of contralateral to progress.
CARDIOVASCULAR	<ul style="list-style-type: none"> ○ Continue to progress from phase 4. ○ Walk/run progression at one year

EXERCISE	
PROGRESSION CRITERIA	<ul style="list-style-type: none">○ Balance, hamstring & quad strength within 10% of normal side○ No patellofemoral irritation, pain or swelling○ Completion of functional and running programs○ No issue with trial return to sport