



Orthopedic Surgery, Sports Medicine & Arthroscopy Specialists

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REHABILITATION PROTOCOL- Patellar/quadriceps tendon repair

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. Control pain and swelling
PRECAUTIONS	<ol style="list-style-type: none"> 1. Crutches and 25% wt bearing for 2 weeks 2. Hinge knee brace locked in extension at all times for 1 week, after 1 week can unlock for exercise. 3. Avoid active quadriceps contraction 4. Limit range of motion from 0-45 degrees 5. 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"> • Patellar mobilization (medial and lateral) • Seated passive knee flexion to 45 degrees • Ankle pumps • Ankle circles & calf stretches for ROM
SUGGESTED THERAPEUTIC EXERCISES	<ul style="list-style-type: none"> • Submaximal Quad sets- ok after week 2 • NMES- ok after week 1
CARDIOVASCULAR	<ul style="list-style-type: none"> • Upper body circuit training or UBE only if the operative extremity is

EXERCISE	not placed in a dependent position so that swelling doesn't increase
PROGRESSION CRITERIA	<ol style="list-style-type: none"> 1. Wound healing 2. Passive knee flexion to 45 degrees 3. Independent ambulation in brace locked in full extension with assistive device

PHASE 2- Weeks 2-6

REHAB GOALS	<ol style="list-style-type: none"> 1. 0-90 degrees passive knee motion 2. Initiate straight leg raise in brace locked 3. Initiate wt bearing as tolerated with brace locked 4. Initiate multi plane straight leg raise using hip stabilizers
PRECAUTIONS	<ol style="list-style-type: none"> 1. Wt bearing as tolerated with brace locked in extension 2. Can only unlock brace during physical therapy 3. Can remove brace for showering at 2 weeks, need shower chair to keep leg straight
RANGE OF MOTION EXERCISES	<ul style="list-style-type: none"> • Patellar mobilization in all directions, scar massage • Tibiofemoral joint mobilization to restore full extension if not present • Passive knee flexion progress to 90 (60 by 4 weeks, 90 by 6 weeks) • Supine passive hamstring, ITB, adductor stretches (knee full extension)
SUGGESTED THERAPEUTIC EXERCISES	<ul style="list-style-type: none"> • upper body & core stabilization with knee locked in brace (avoid quad activation) • Abdominal crunches, seated trunk rotations • Isometric contraction of lower extremity muscles • Weight shifting exercises, single leg balance with brace locked in extension • Side and prone leg raises, clam progression • Straight leg raises in locked brace
CARDIOVASCULAR EXERCISE	Upper body ergometer
PROGRESSION CRITERIA	<ol style="list-style-type: none"> 1. Passive knee flexion to 90 2. Normal patellar mobility 3. Elimination of extensor lag with straight leg raise 4. Initiate wt bearing exercise and restore wt bearing status as tolerated in brace

PHASE 3- Weeks 6-10

REHAB GOALS	<ol style="list-style-type: none"> 1. Restore knee ROM 0-120 2. Minimize postop swelling 3. Eliminate extensor lag with straight leg raise (3 setx15 reps w/o brace) 4. Restore symmetrical gait without brace 5. Initiate double leg closed chain strengthening in limited ROM 0-30
PRECAUTIONS	<ol style="list-style-type: none"> 1. Unlock brace 0-90 for initial ambulation until appropriate quad control, then can remove brace (gradually wean over 1-2 weeks) 2. Avoid post activity swelling
SUGGESTED THERAPEUTIC EXERCISES	<ul style="list-style-type: none"> • Soft tissue mobilizations, tibiofemoral joint mobilizations & tibial rotation mobilizations, femoral & tibial anterior & posterior glides • Continue lower extremity stretching & begin hip flexor stretching (avoid aggressive prone quad stretching) • Progress quad activation to include open chain short arc quad & standing terminal knee extension with resistance band • Progress straight leg raises to light ankle weights once good quad control • Exercise ball double leg assisted squats • Single leg balance from with brace to without brace (level surface), progress to unstable surface • Progress open chain multiplane straight leg raises w/ankle weights • Concentric-eccentric quadriceps in sitting bet 0-45 (avoid resistance) • Closed chain standing one-third knee bends (0-30) in brace progressing to out of brace
CARDIOVASCULAR EXERCISE	UBE, zero resistance stationary bike when 110 flexion achieved, deep water aqua jogging, core stabilization, plank progression
PROGRESSION CRITERIA	<ol style="list-style-type: none"> 1. Symmetrical gait with good quad control 2. Knee active ROM 0-120 3. Able to perform double leg knee squat to 30 w/o anterior knee pain and good control 4. Minimal swelling post-activity

PHASE 4- Weeks 10-14

REHAB GOALS	<ol style="list-style-type: none"> 1. Restore symmetrical knee active ROM 2. Progress closed chain double leg strengthening (0-60) 3. Initiate step training promoting restoration of eccentric quad control 4. Eliminate swelling/effusion
PRECAUTIONS	<ol style="list-style-type: none"> 1. Closed chain double leg strengthening limit to 60 degrees
SUGGESTED THERAPEUTIC EXERCISES	<ul style="list-style-type: none"> • Continue soft tissue mobilizations, tibiofemoral joint mobilizations & tibial rotation mobilizations, femoral & tibial anterior & posterior glides. Initiate PNF contract-relax stretching for quads

	<ul style="list-style-type: none"> • Continue lower extremity stretching, start prone manual knee flexion, dynamic quad stretching • Progress quad activation to include step progression (4-6 inch) • Long arc quad extensions 90 to 0 without resistance • Double leg squats with side to side weight shifts to promote single leg stability • Single leg balance progression on unstable surface, incorporate upper extremity & trunk patterns • Progress open chain multiplane straight leg raises w/ankle weights • Gradually advance knee ROM during double leg closed chain strengthening • Single leg static holds at 20 deg of flexion, resisted side stepping • Double leg stance chopping • Advance lower extremity diagonal patterns
CARDIOVASCULAR EXERCISE	UBE, advance stationary bike to include resistance, elliptical, treadmill uphill walking (7-12% grade), progress core stability
PROGRESSION CRITERIA	<ol style="list-style-type: none"> 1. Symmetrical knee ROM 2. Pain free activities of daily living 3. Ascend & descend 8 inch step w/ good control of lower extremity 4. No anterior knee pain during or after strengthening

PHASE 5- Weeks 14+

REHAB GOALS	<ol style="list-style-type: none"> 1. Incorporate agility & sport specific training 2. Restore cardio fitness & endurance 3. Restoration of 90% strength 4. Return to sport
PRECAUTIONS	1. Closed chain double leg strengthening limit to 60 degrees
SUGGESTED THERAPEUTIC EXERCISES	<ul style="list-style-type: none"> • Mobilizations as needed, continue quad & lower extremity stretching • Add resistance to open chain quad strengthening bet 60 and 0 • Advance balance and proprioceptive training • Single leg supported squatting, single knee bends to 60 • Advance lower extremity weight training • Lunge progression from split to single plane to multiplane • Double leg plyometrics at 4 months • Begin with agility training (lateral shuffle). Advanced (W, Z, chop downs) at 5 months • Lateral step downs • Olympic lifting, single leg plyometrics at 6 months

CARDIOVASCULAR EXERCISE	Advance cardio training, jogging progression, continue core & upper body workouts
PROGRESSION CRITERIA- Return to Sport	<ol style="list-style-type: none">1. Pain free and no apprehension with sport specific activity2. Symmetrical active knee ROM3. 90% quad strength compared to normal side4. Successful completion of functional/return to sport test