



Orthopedic Surgery, Sports Medicine & Arthroscopy Specialists

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REHABILITATION PROTOCOL- Tibial tubercle osteotomy

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 repair2. Restore knee range of motion – full knee extension and Knee flexion to: 90 degrees3. Restore leg control – no lag with straight-leg-raise4. Eliminate effusion
PRECAUTIONS	<ol style="list-style-type: none">1. Crutches and toe touch weight bearing (TTWB). Brace locked in extension for weight bearing2. Brace on for sleep for 4 weeks, afterwards can remove for sleep.3. Ok to remove brace for exercises except straight leg raises4. 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, hamstring stretches○ Supine wall slides and heel slides to 90 degrees○ Patellar mobilization- inferior and superior
SUGGESTED THERAPEUTIC EXERCISES	<ul style="list-style-type: none">○ Quad, gluteal, hamstring sets○ SLRs○ Calf pumps, ankle strengthening exercises
CARDIOVASCULAR	Upper body circuit training or UBE

EXERCISE	
PROGRESSION CRITERIA	<ul style="list-style-type: none"> ○ Straight leg raise without extension lag ○ No effusion ○ Knee flexion to 90 degrees and full extension

PHASE 2- 2-6weeks

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. Initiate open chain strengthening 4. Minimize pain and swelling
PRECAUTIONS	<ol style="list-style-type: none"> 1. Crutches and partial weight bearing (PWB). Brace locked in extension for weight bearing for 6 weeks 2. Brace on for sleep for 4 weeks, afterwards can remove for sleep. 3. Ok to remove brace for exercises except straight leg raises 4. 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 ○ Soft tissue mobilization ○ Patellar mobilization- inferior and superior
SUGGESTED THERAPEUTIC EXERCISES	<ul style="list-style-type: none"> ○ Quad, gluteal, hamstring sets ○ SLRs in all planes ○ Calf pumps, ankle strengthening exercises ○ Clamshell & bridges
CARDIOVASCULAR EXERCISE	<p>Upper body circuit training or UBE</p> <p>Low resistance stationary bike</p>
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

PHASE 3- 6-10 weeks postop

REHAB GOALS	<ul style="list-style-type: none"> ○ Normalize gait ○ Maintain full ROM ○ Initiate close chain strengthening
PRECAUTIONS	<ul style="list-style-type: none"> ○ Avoid post activity swelling ○ No impact activities ○ Begin Wt bearing as tolerated with crutches, progress to one crutch then full weight bearing at 10 weeks ○ Unlock brace at 6 weeks for ambulation

RANGE OF MOTION EXERCISES	<ul style="list-style-type: none"> ○ Continue exercises from phase 2.
SUGGESTED THERAPEUTIC EXERCISES	<ul style="list-style-type: none"> ○ Straight leg raises in 4 planes, add ankle weight when no extensor lag ○ Clamshell with weight above knee and bridge progression ○ Sit to stand from chair, 2 inch step exercises, including anterior, lateral and retro step up ○ Balance and proprioception exercises for LE seated on therapy ball, then progress to single leg stance with the contralateral LE in a toe touch position and, finally, single leg stance on the affected lower extremity with a goal of maintaining for 30 sec
CARDIOVASCULAR EXERCISE	Non-impact endurance training: stationary bike (high seat low tension), pool walking
PROGRESSION CRITERIA	<ul style="list-style-type: none"> ○ Normal gait on all surfaces without assistive device ○ Single leg stance with eyes open for 30 seconds ○ Full range of motion

PHASE 4- 10-14 weeks postop

REHAB GOALS	Full pain free ROM and normal gait 4/5 hamstring and quad strength Climb stairs reciprocally without pain
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"> ○ Mini squats and leg press <60 deg. Advance to single leg squats <60 deg. Use isometric hip adduction with squats ○ Increase strengthening from phase 3 ○ Single leg balance w/eyes open and contralat LE in toe touch position, progress to single leg balance with eyes open and no contralat involvement with goal of 30 sec ○ Open chain light quad strengthening at 12 weeks ○ Seated hamstring curls ○ Step ups/step downs starting with 4 inch step. Avoid hip adduction, IR

	<ul style="list-style-type: none"> ○ Bridges & hamstring curls on thera-ball
CARDIOVASCULAR EXERCISE	Elliptical, pool walking, stationary bike.
PROGRESSION CRITERIA	<ul style="list-style-type: none"> ○ Normal gait ○ Climb stairs reciprocally without pain ○ 4/5 quad and hamstring strength ○ Single limb balance >1 min

PHASE 5- 14-24 weeks

REHAB GOALS	5/5 quad, hamstring, hip strength Single leg balance 2 min Jogging
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 ○ Single leg balance activities on uneven surfaces at 16 wks ○ Single leg stance exercises with progression of opposite LE reach, bilateral UE reach, weighted bilateral UE reach as tolerated. Add single leg stance with UE weighted ball toss against rebounder, standing on flat surface. ○ Slide board & uneven balance at 4 months ○ Lunges, starting forward & progress as tolerated ○ Forward & sideways lunge on BOSU ball, single leg stance ball toss on uneven surfaces, BOSU squats ○ Pushups and planks ok to start ○ Light plyometrics at 5 months & slowly progress ○ Step ups & step overs ○ Low speed agility activities at 20 weeks (shuffling, figure 8, carioca)
CARDIOVASCULAR EXERCISE	<ul style="list-style-type: none"> ○ Continue to progress from phase 3. Start walk/jog progression at 4 months
PROGRESSION CRITERIA	<ul style="list-style-type: none"> ○ 5/5 strength ○ No patellofemoral irritation ○ Pain free jogging ○ Single leg balance 2 min ○ Jump & landing control

PHASE 6- 24+ weeks

REHAB GOALS	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 5○ Advance plyometrics○ Sport specific exercises, increasing speed in progressive manner
CARDIOVASCULAR EXERCISE	<ul style="list-style-type: none">○ Continue to progress from phase 3. Start walk/jog progression at 4 months
PROGRESSION CRITERIA- RETURN TO SPORT	<ul style="list-style-type: none">○ 90% quad & hamstring strength of contralateral○ No patellofemoral irritation○ Evidence of x-ray healing of osteotomy○ Full speed sport specific drills without pain