

Tibial Tubercle Osteotomy (TTO) Rehabilitation Protocol

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Procedure: Isolated Tibial Tubercle Osteotomy

PT Frequency: 2-4 times per week

ROM Restrictions: 0-90 x 2 weeks, then advance as tolerated

Brace: Locked in full extension x 2 weeks, then unlocked 0-90 until 6-8 weeks

Weightbearing: TTWB x 6 weeks, then PWB (25% with progression to full WBAT at 8 weeks)

PHASE I (Weeks 0 – 2):

- **Weightbearing:** Touch Down Weightbearing (TDWB) x 6 weeks with crutches and brace
- **Brace:** Worn at all times locked in full extension. Ok to remove for hygiene and exercises.
- **Range of Motion:** 0-90° with emphasis on full extension
- **Home Exercises:** Quad sets with brace locked at 0°, patellar mobilization, straight leg raise in brace locked at 0°, calf/ankle pumps, passive leg hangs to 90°

Phase II (Weeks 2 – 8)

- **Weightbearing:** TDWB weeks 2-6, then progress to partial weightbearing (25% then 50%) with goal of weightbearing as tolerated (WBAT) with crutches and brace by 8 weeks
 - Discontinue crutches when gait normalized and non-antalgic
 - Discontinue brace once fully WBAT without crutches
- **Brace:** Unlocked during day 0-90°, off at night, for hygiene and exercises
 - Discontinue after 6-8 weeks when WB comfortably
- **Range of Motion:** Full unlimited active/passive ROM
- **Exercises:**
 - PROM/AAROM to tolerance, patella and tibiofibular joint mobs
 - Begin floor based core and glute/quad/hamstring exercises
 - 6-8 weeks: Addition of heel raises, closed chain lower body, gait normalization, eccentric quads/hamstrings; advance core, glutes and pelvic stability
 - Begin stationary bike as tolerated after 6 weeks

Phase III (Weeks 8 – 12)

- **Weightbearing:** Full WBAT
- **Hinged Knee Brace:** None
- **Range of Motion:** Full
- **Exercises:**
 - Progress closed chain activities
 - Begin hamstring work, lunges/leg press 0-90°, proprioception exercises, balance/core/hip/glutes

Phase IV (Weeks 12 – 16)

- **Weightbearing:** Full WBAT

- **Brace:** None
- **Range of Motion:** Full
- **Exercises:**
 - Progress Phase III exercises and functional activities: walking lunges, planks, bridges, swiss ball, half-bosu exercises
 - Advance core/glutes, balance, flexibility
 - May advance to elliptical, pool as tolerated after 12 weeks

Phase V (Weeks 16+)

- **Weightbearing:** Full WBAT
- **Brace:** None
- **Range of Motion:** Full
- **Exercises:**
 - Slowly advance all activity as tolerated
 - Progress to functional training, including running, jumping, pivoting, and sports activity after 16 weeks
 - Return to play as tolerated when cleared by MD

Exercise	Week														
	1	2	3	4	5	6	7	8	9	10	12	16	20	24	
Initial Exercises:															
ROM Goals	0-30°		0-60°		0-90°		Progress to full								
Flexion/extension, heel slides/seated	[Green bar]														
Patella/Tendon mobilization	[Green bar]														
Quad Series	0° ISOs, SLR				60° ISO		70-30° arc-resisted			Full arc resisted					
Hamstring series	[Green bar]														
Sit and reach for hamstrings	[Green bar]														
Ankle Pumps	[Green bar]														
Crutch weaning	NWB					Begin WBAT progress to full by 8 weeks				[Green bar]					
Heel prop knee extension stretch	[Green bar]														
SLR (w/ brace until quad control restored)	[Green bar]														
Toe and heel raises	[Green bar]														
Balance series	[Green bar]														
Weight-bearing Strength Exercises:															
Double knee bends	[Green bar]					[Green bar]									
Leg Bridges (2 □ 1 leg)	[Green bar]					[Green bar]									
Begin cord exercises	[Green bar]					[Green bar]									
Leg press (ISO □reps, 2 □ 1 leg)	[Green bar]					[Green bar]									
Reverse lunge- static hold	[Green bar]					[Green bar]									
Dead Lift (2 □1 leg)	[Green bar]					[Green bar]									
Sports Test exercises	[Green bar]					[Green bar]									
Cardiovascular Exercises:															
Bike with both legs-no resistance	[Green bar]					[Green bar]									
Bike with both legs- resistance	[Green bar]					[Green bar]									
Aqua jogging	[Green bar]					[Green bar]									
Treadmill-walking (no limp)	[Green bar]					[Green bar]									
Swimming with fins-light flutter kick	[Green bar]					[Green bar]									
Elliptical Trainer	[Green bar]					[Green bar]									
Stair stepper	[Green bar]					[Green bar]									
*Cardio Exercises	Must tolerate daily walking with no limp & no significant increase in pain/swelling prior to initiating WB cardio (walk, elliptical, stepper)														
Agility Exercises:															
Running Progression	[Green bar]					[Green bar]									
Initial-Single Plane	[Green bar]					[Green bar]									
Advance-Multi Directional	[Green bar]					[Green bar]									
Functional Sports Test	[Green bar]					[Green bar]									
High Level Activities:															
Golf Progression	[Green bar]					[Green bar]									
Outdoor biking, hiking, running	[Green bar]					[Green bar]									
Return to Full Sport at 6-8 months post-op	[Green bar]					[Green bar]									

Adapted from post-operative protocol by Dr. Jorge Chahla created by Howard Head Physical Therapy, Jill Monson, PT, OCS and Jon Schoenecker, PT, OCS, CSCS