



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

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