

Tibial Plateau ORIF

Physical Therapy Protocol · Protected Weight Bearing With Early Motion Emphasis

Modeled on the Brigham and Women's Hospital rehabilitation standard of care for tibial plateau fracture and the Houston Methodist ORIF tibial plateau protocol. Weight-bearing progression is surgeon- and radiograph-driven; early knee ROM is prioritized throughout the protected period.



AT A GLANCE

TIMELINE	5–6 months total; protected weight bearing dominates the first 6–12 weeks while ROM is restored early
WEIGHT BEARING	NWB/TTWB with crutches 6–12 weeks per fracture stability and surgeon; progression to partial then full WB only with radiographic healing
KEY MILESTONES	90° flexion by week 4 · full ROM by weeks 8–12 · full weight bearing and crutch wean ~weeks 8–12 · ambulation without device or limp thereafter
RETURN TO ACTIVITY	Low-impact conditioning after full WB restored; jogging ~5–6 months and return to sport ~6 months with surgeon clearance

KEY PRECAUTIONS

- Strict adherence to prescribed NWB/TTWB status (commonly 6 weeks for stable patterns, up to 12 weeks for unstable or depressed fractures); advancing weight bearing is a surgeon/radiograph decision.
- Hold therapy and refer to the surgeon if loss of reduction is suspected (sudden increase in pain, swelling, deformity, or instability).
- Elevated DVT risk after tibial plateau fracture (approximately 10%); monitor for calf pain, disproportionate swelling, and pitting edema.
- Hinged knee brace per surgeon to avoid varus/valgus strain across the fracture; position at 0° extension at rest to prevent flexion contracture.

PHASED REHABILITATION

PHASE 1 — PROTECTION & EARLY MOTION		Weeks 0–6
GOALS	- Protect fixation with strict NWB/TTWB gait - Achieve 90° flexion by week 4 and preserve full extension - Control edema and re-establish quadriceps activation	
INTERVENTIONS	- TTWB or NWB with crutches/walker per surgeon; hinged brace locked per surgeon orders (commonly locked until first post-op visit, then unlocked for exercise) - Rest positioning in full extension; low-load extension stretching and prone hangs as needed - Early PROM/AAROM: heel slides, wall slides, seated flexion within pain tolerance; CPM per surgeon when prescribed - Patellar mobilization; tibiofemoral mobilization deferred until fracture healing - Quad sets, straight leg raises (no lag before unbraced SLR), hamstring sets, 4-way hip strengthening, ankle pumps - Blood flow restriction training for quadriceps atrophy prevention if available and not contraindicated - Edema management: elevation, compression, cryotherapy; circumferential girth monitoring	
CRITERIA TO ADVANCE	- Flexion $\geq 90^{\circ}$–120° with full extension - Independent, safe NWB/TTWB gait with device on level surfaces and stairs - Quad set with superior patellar glide; SLR without extensor lag - No wound complications; effusion controlled	

PHASE 2 — PROGRESSIVE WEIGHT BEARING		Weeks 6–12
GOALS	- Advance weight bearing per surgeon once radiographic healing is confirmed (stable patterns ~6–8 weeks at 50% partial WB; unstable patterns remain protected to 12 weeks) - Restore full active and passive ROM - Continue proximal and quadriceps strengthening within WB restrictions	
INTERVENTIONS	- Graduated partial weight-bearing gait training with crutches once cleared; advance ~50% toward full over about 2 weeks - Stationary bike without resistance for ROM; progress flexion to full - Open-chain strengthening: short-arc quads progressing to long-arc, hamstring curls, multi-plane SLR with resistance - Proximal hip and core strengthening; well-leg and upper-body conditioning - Pool/deep-water exercise once incision fully healed and WB status allows - Scar mobilization and continued edema control	
CRITERIA TO ADVANCE	- Radiographic evidence of healing with surgeon clearance for WB progression - Full or near-full ROM (0° to $\geq 120^{\circ}$) - Pain-free partial weight bearing without reactive effusion	

PHASE 3 — FULL WEIGHT BEARING & STRENGTHENING		Weeks 12–16
GOALS	- Restore normalized gait without assistive device or limp - Progressive closed-chain strengthening and balance - Independent stair negotiation (reciprocal pattern)	
INTERVENTIONS	- Progress to full weight bearing and wean crutches; gait training emphasizing symmetric stance time and push-off - Closed-chain progression: mini-squats, leg press, step-ups, wall sits, calf raises - Stationary bike with progressive resistance; elliptical when gait normalized - Balance and proprioception: single-leg stance, foam/perturbation progression - Stair training progressing to reciprocal ascent/descent - Discontinue brace per surgeon	
CRITERIA TO ADVANCE	- Ambulation without assistive device and without visible limp - Full, pain-free ROM - Reciprocal stair negotiation - Single-leg stance approaching symmetry with uninvolved limb	

PHASE 4 — ADVANCED STRENGTHENING & RETURN TO ACTIVITY		Months 4–6+
GOALS	- Restore lower-extremity strength to 5/5 or near-symmetric - Return to occupational demands and low-impact recreation - Graded reintroduction of impact where appropriate for fracture pattern and joint surface	
INTERVENTIONS	- Progressive resistance training: squats, lunges, leg press, deadlift patterns, single-leg work - Low-impact aerobic conditioning: walking program, swimming, cycling, elliptical - Jogging progression only with surgeon clearance, typically after 5–6 months, once strength and gait criteria met - Work- or sport-specific functional training; agility progression when cleared - Education on long-term joint protection given articular injury (activity modification, load management, body weight)	
CRITERIA TO ADVANCE	- Lower-extremity strength 5/5 or limb symmetry approaching 90% - Balance on involved limb equal to uninvolved limb - No pain or effusion with full ADL and conditioning program - Anticipated return to sport approximately 6 months post-op with surgeon clearance	

GUIDING PRINCIPLES

This protocol follows criterion-based progression over rigid time-based advancement; phased rehabilitation balancing tissue healing with controlled stress application; objective milestones (ROM, strength LSI, functional testing) to guide phase transitions; individualization based on surgical findings, tissue quality, and patient factors; and ongoing surgeon–therapist communication throughout recovery.

REFERENCES

- Brigham and Women's Hospital, Department of Rehabilitation Services. Standard of Care: Tibial Plateau Fracture. <https://www.brighamandwomens.org/assets/BWH/patients-and-families/rehabilitation-services/pdfs/knee-tibia-plateau-fracture.pdf>
- Houston Methodist Orthopedics & Sports Medicine (McCulloch PC). Rehabilitation Protocol: ORIF Tibial Plateau Fracture. <https://doctormcculloch.com/wp-content/uploads/2024/04/161168.pdf>

For clinical use by licensed physical therapists treating patients of Robert Pettit, MD. This document is a rehabilitation guideline, not a substitute for clinical judgment. Progression must be individualized based on intraoperative findings, tissue quality, and patient response. Scan the QR code for the current version of this protocol.