

Rehabilitation Protocol: Tibial Tubercle Osteotomy ± MPFL Reconstruction

Date of Surgery: _____

TTO: ☐ Anteromedialization (AMZ) ☐ Medialization ☐ Anteriorization ☐ Distalization

Concomitant: ☐ MPFL Reconstruction ☐ Lateral Lengthening ☐ Cartilage Procedure

Distalization modifications are listed in each phase. **Cartilage Procedure:** If a cartilage procedure is performed, refer to the cartilage protocol. Trochleoplasty and DFO follow separate protocols.

Progression is milestone-based. Outcome measures: LEFS, IKDC, NPRS, MPFL-RSI. Return-to-sport assessments (quantitative strength, hop, and movement quality testing) are recommended. Please contact our office with any questions or concerns.

☐ **Phase I – Protection (Weeks 0–6)**

- **PT:** Begin at 1 week (1×/week; 2×/week from 6 weeks, or earlier if needed)
- **Weightbearing: Weeks 0–2: TTWB with crutches. Weeks 2–6: protected WBAT with crutches, brace locked in extension. Distalization or high BMI: TTWB for 4 weeks, then protected WBAT with brace locked through 6 weeks**
- **Hinged Knee Brace:** Locked in extension for all ambulation and sleep for 6 weeks; removed for PT and showering
- **Precautions:** No active open chain knee extension; no kneeling on the incision/tubercle; avoid lateral patellar translation (if MPFL); avoid quad inhibition and effusion
- **Range of Motion** – Immediate ROM as tolerated (PROM, AAROM, then AROM). **Goals: 0–60° by 2 weeks, 0–90° by 4 weeks, 0–≥120° by 6 weeks** – contact our office if not trending toward 90° by 4 weeks. Passive extension with towel under heel; patellar mobilization as directed
- **Therapeutic Exercises**
 - Quad sets with **NMES (quad stim) 20 minutes 3× daily**, starting as soon as possible; co-contractions; glute sets; ankle pumps and ankle strengthening
 - Isometric hip abduction/adduction
 - Consider BFR training; cryotherapy
 - **Bone stimulator** 20 minutes daily, starting after the first post-op visit
- **Criteria to Progress:** Pain and effusion controlled; good quad contraction; ROM 0–≥120°; independent with crutches and brace

☐ **Phase II – Brace Wean and Early Strengthening (Weeks 6–12)**

- **Brace/Weightbearing:** At 6 weeks, unlock brace for ambulation if able to perform SLR without lag and radiographs show appropriate healing. Wean brace weeks 6–8 and progress to full WB with normalized gait; discharge crutches once no quadriceps avoidance
- **Precautions:** No open chain knee extension until week 10; avoid pivoting on a planted foot
- **Range of Motion** – Progress to >125° (full) by ~10–12 weeks; stationary bike once ≥115° flexion
- **Therapeutic Exercises**
 - **Weeks 6–10:** SLR; partial wall sits; TKEs with band (0–45°); closed chain quad strengthening in pain-free arcs; leg press (bilateral, progressing to single leg); calf raises
 - **Weeks 10–12:** Hamstring strengthening; band resistance 0–45°; light open chain knee extension in a limited arc (90–40°)
 - Proximal hip and core strengthening (side planks, bridges); balance on level surfaces with good alignment
- **Criteria to Progress:** Full ROM; normal gait without device or brace; SLR without lag; no effusion; good single-leg alignment

☐ **Phase III – Strengthening (Weeks 12–20)**

- **Therapeutic Exercises**
 - **Weeks 12–16:** Slow treadmill walking (forward, then backward); balance/proprioception progression; squat and step-up/step-down progressions; eccentric quad strengthening
 - **Weeks 16–20:** Advance closed chain strengthening with single-leg focus; light plyometrics (double leg); progress open chain knee extension arc
 - Elliptical once good 6" step-up; bike with resistance
- **Criteria to Progress:** Pain-free strengthening; controlled 6–8" step-down; good single-leg strength and alignment; radiographic union; clearance to begin running

☐ **Phase IV – Running and Return to Sport (Month 5+)**

- **Therapeutic Exercises**
 - Continue strength training with single-leg loading
 - Progressive running program (interval walk/run on non-consecutive days) and plyometric progression (double to single leg)
 - Agility progression: linear, then lateral, then cutting – non-contested before contested drills
- **Return to Sport: Typically 9–12 months**, criteria-based, with physician clearance once return-to-sport assessment shows quadriceps strength equal to the contralateral limb, symmetric hop testing, good movement quality, and no apprehension