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Rehabilitation Protocol: Medial Patellofemoral Ligament (MPFL) Reconstruction ± Tibial Tubercle Osteotomy (TTO)

Surgeon: William J. Robertson, MD

Facility: TMI Sports Medicine, Arlington, TX

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General Guidelines:

- **Bracing and Weight-Bearing Progression:**
 - **Isolated MPFL Reconstruction:**
 - WBAT locked in **extension** for **weeks 0-4**, then **unlock brace and initiate ambulation**.
 - **MPFL Reconstruction + Tibial Tubercle Osteotomy:**
 - **Weeks 0-2: 20 lbs foot-flat weight-bearing (FFWB) locked in extension**
 - **Weeks 2-6: WBAT in extension** with progressive transition
 - **Week 6: Unlock brace** and transition to **full WBAT**
 - **Range of Motion (ROM) Progression:**
 - **Weeks 0-2: Seated ROM 0-60°**
 - **Weeks 2-6: Increase to 90° flexion** by week 6
 - **After week 6: Progressive increases in ROM**
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Phase 1: Post-op Weeks 0-2

Goals:

- ✓ Protect surgical repair
- ✓ Initiate early quadriceps activation
- ✓ Begin gentle ROM

Weight-Bearing and Brace Use

- **MPFL Only: WBAT locked in extension** (brace remains locked)
- **MPFL + TTO: 20 lbs foot-flat weight-bearing**, locked in extension

Range of Motion (ROM)

- **Seated ROM: 0-60°**
- **Heel Slide, PROM**
- **Recumbent bike (non-op leg assists): PROM** of operative knee, rock for range, max **60° flexion**
- **Restore Passive Knee Extension**

Exercises

- ✓ **Straight leg raises** (brace locked in extension)
- ✓ **Quadriceps sets**
- ✓ **Side-lying hip abduction/adduction**
- ✓ **Core and upper body strengthening** (avoid stress on the knee)

Other Guidelines

- **Cryotherapy/Icing:** Every 2 hours for 20 minutes prn



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- **Pain management:** Per surgeon's instructions

Phase 2: Post-op Weeks 2-6

Goals:

- ✓ Increase ROM (target **90° flexion by week 6**)
- ✓ Improve quadriceps activation
- ✓ Gradual weight-bearing progression

Weight-Bearing and Brace Use

- **MPFL Only:** WBAT locked in extension from weeks 2-4 and then unlock
- **MPFL + TTO:**
 - **Weeks 2-6:** Gradual WBAT locked in extension
 - **Weeks 6:** Unlock brace and continue transition to WBAT
 - **Anti-gravity treadmill** can begin at 40% at week 5 unlocked

Range of Motion (ROM)

- **Recumbent bike:**
 - **Weeks 2-6:** gradual increases with ROM 0-90 by 6 wks.
 - **Continue Heel Slide**
- **Closed-chain wall squats and shuttle:** In brace (progress flexion angle each week) (for isolated MPFL only! ... with a TTO wait until week 6 for 0-40)



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- **0-40° (Week 4)**
- **0-50° (Week 5)**
- **0-60° (Weeks 6)**

Exercises

- ✓ **Straight leg raises & quad sets**
- ✓ **Side-lying hip abduction/adduction**
- ✓ **Closed-chain strengthening (body weight only)**

BFR may begin after week 2.

Phase 3: Post-op Weeks 6-12

Goals:

- ✓ **Normalize gait pattern**
- ✓ **Discontinue brace – Neenca or Bauerfeind Sleeve after brace removal and until week 8.**
- ✓ **Increase strength & stability**

Weight-Bearing and Brace Use

- **MPFL Only:** Unlock brace at **week 4**, fully discontinue when good quad strength
- **MPFL + TTO:** Unlock brace at **week 6**, fully discontinue when good quad strength

Range of Motion (ROM)

- **Week 6-7:** Stationary bike **low resistance, ROM as tolerated**



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- **Week 7-10:** Progressive flexion (goal approaching full by week 12)
- **Week 8:** Shallow stepper for cardio conditioning
- **Week 10:** Progress to elliptical

Strengthening & Functional Training

- ✓ **Leg press (no resistance initially, gradually increase)**
- ✓ **Slide board exercises (brace progression)**
- ✓ **Closed-chain wall squats, multi-plane lunges, single leg wall sit / squats, Bridge**
- ✓ **Balance & proprioception exercises**

Initiate Open-Chain Knee extension at week 6, Short arc quad 0-60 degrees

Phase 4: Post-op Weeks 12-16

Goals:

- ✓ **Restore strength and endurance**
- ✓ **Introduce sport-specific training**

Strength & Conditioning

- Continue **progressive strengthening**
- **Squats, Deadlifts, Ladders**
- **Open Chain Knee Ext Week 12, Long Arc Quad 0-90 Deg**

Sport-Specific Drills

- **Plyometrics:** Begin low-impact drills



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- **Running progression:** Week 12-14 (can begin on anti-gravity treadmill)
- **Cutting & agility drills:** Weeks 15-18

Phase 5: Return to Full Activity (Week 18+)

- ✓ **Full strength and ROM restoration**
- ✓ **Clearance for return to sport**
- ✓ **Gradual return to high-impact activities**

Key Considerations:

- **Continue quad and glute activation**
- **Monitor for swelling or instability**
- **Sport-specific conditioning**
- **Suggested Criteria for Discharge:**
 - Full ROM
 - LSI Quad and Hamstring 90% of contralateral limb
 - Single Leg Repetitive Sit to Stand (as many as possible in 30 seconds) with goal of 90% of contralateral limb.

Summary of Major Differences Between MPFL Alone vs. MPFL + TTO:

Rehab Component	MPFL Alone	MPFL + TTO
Weight-bearing	WBAT from Day 1	20 lbs FFWB x 2 weeks →



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Rehab Component	MPFL Alone	MPFL + TTO
		WBAT
Brace Unlocking	Week 4	Week 6
ROM Progression	0-60° (Wk 0-2) → 90° by Wk 6	Same
Closed-Chain Exercises	Early introduction	Delayed for TTO healing
Slide Board & Stepper	Week 6	Week 8
Return to Sport	Week 18+	Week 18-24

This protocol balances **protecting the repair** with **early mobilization**, ensuring **progressive weight-bearing** and **ROM restoration** while addressing the **additional osseous healing requirements** for a TTO.



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