These guidelines, treatments, and milestones have been established to assist in guiding rehabilitation based on the most current available evidence. They are not intended to be substitute for sound clinical judgement with consideration of the individual contextual features of the patient and the demands of various functions/sports.

Additional recommendations with additional procedure of Tibial tubercle osteotomy:
For patients who are s/p MPLF-R with Tibial Tubercle Osteotomy (TTO) the following changes are recommended:

- PWB for the first 4 weeks and progress to WBAT at week 4
- Brace locked in extension for first 6 weeks
- AAROM can be initiated immediately
- ROM milestone: 0-90 deg by week 6

**Weeks 0 – 6 (approximately)**
*Recommend PT follow up during Week 1, Week 3 and Week 6*

**Milestone to advance to next phase:**

- MD appointment for follow-up
- AROM 0-90 degrees

**Recommendations:**

- Initial HEP prescription including: 4-way SLR with brace in full extension, PROM/ AAROM knee flexion, calf pumps, quad sets, heel slides
- Instruction in total body conditioning program including: LE flexibility, core/ hip/ ankle strengthening, Non-operative limb conditioning
- WBAT with brace locked in extension (unless otherwise instructed by your surgeon)
- Administer patient reported outcome measures (ie: SANE Score, PSFS, IDKC)

**Weeks 4 – 6 (approximately)**
*Recommend weekly PT follow up*

**Milestones to unlock brace/ proceed to next phase:**

- 20 repetitions 4-way SLR without extension lag
- Single leg squat to supported high surface with adequate quad control and no knee valgus
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Single leg stance >30 sec without deviation of hip drop, knee valgus, or overpronation

**Recommendations:**
- Begin CKC strength (ex: mini Squats, heel raises, progressive step up/down, SL squats, leg press, lunges)$^{4,5,10}$
  - Ensure appropriate alignment during these activities avoiding contributory movements into knee valgus
- Progress OKC strength (ex: resisted SLR with brace off if no extensor lag, leg extensions without weight, hamstring PRE)$^{4,5,10}$
- Balance and proprioception (ex: SLB, uneven surface, eyes closed, head turns)
- Stationary biking

**Weeks 7 – 9**
*Recommend weekly PT follow up*

**Milestone to discontinue brace/ proceed to next phase:**
- Restoration of normalized gait mechanics$^{11}$
- Re-assessment of SANE Score$^7$
- Improved score for PSFS by 2-3 points$^8$
- Reciprocal ascend and descend 8-inch step with rails
- Knee AROM 0-120 degrees$^{12}$

**Recommendations:**
- Advance CKC strengthening (ex: 8 inch step up/ down, advances SL squats, Y balance training, resisted side stepping, sport cord)
- Advance balance and proprioception (ex: wobble boards, dyna-disc, ball tosses)

**Weeks 10-22**
*Recommend weekly to bi-weekly PT follow up*

**Milestone to progress to next phase:**
- No signs and symptoms of patellar instability
- Full AROM
- Good control and no pain with squats and lunges
- Dynamically stabilize knee with good eccentric control with SL activities

**Recommendations:**
- Once brace is discontinued, stabilizing brace can be utilized by the patient PRN
- Progress CV fitness program (Biking outside, brisk walking)
- Begin return to jogging/ running (weeks 10-16)$^{2,4,5,10,13}$
- Begin Agility (Week 12-20)$^{4,10}$
- Begin plyometrics (week 13-24)$^{4,5,10}$
- Begin Sports Specific training (weeks 14-19)$^{4,10}$

**Return to Sports Participation (Week 17-28):**
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Adapted from: 2013 ISAKOS Sports Medicine Committee Return-to-Play Criteria, London 2013

- No concerns of knee pain or knee instability
- Full/ near full AROM of knee
- No knee effusion
- Acceptable control with dynamic activities (Star Excursion Balance Test)
- Limb Symmetry Index >85% on hop tests
- Full Strength on MMT assessment of LE
- Athlete demonstrates a psychological readiness to return to sport (eg SANE score > 80/100)

For questions regarding the patient’s medical care, new orders, or insurance questions:
please contact your physician's office directly

For additional questions, comments, or concerns regarding the implementation of these physical therapy guidelines, please contact Chris Sebelski, PT, DPT, PhD, OCS, Director of the SLU – SSM Health Physical Therapy Residency @ 314 977 8724 OR chris.sebelski@health.slu.edu

Please respond to our anonymous survey regarding these guidelines to assist in improving patient care and advocacy. https://slu.az1.qualtrics.com/jfe/form/SV_bpX7Z9AaVTzGblj

Appendices of referenced assessments

<table>
<thead>
<tr>
<th>Soreness Rules Adapted from Fees et al. 1998</th>
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<tbody>
<tr>
<td><strong>Criterion</strong></td>
</tr>
<tr>
<td>1. Soreness during warm-up that continues</td>
</tr>
<tr>
<td>2. Soreness during warm-up that goes away</td>
</tr>
<tr>
<td>3. Soreness during warm-up that goes away from redevelops during session</td>
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<tr>
<td>4. Soreness the day after lifting (not muscle soreness)</td>
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<tr>
<td>5. No soreness</td>
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References:


