**Physical Therapy Post-Operative Guidelines**

**Tibial Tubercle Osteotomy (Anteromedial)**

### Phase I: 0-4 Weeks

**Precautions:** Flexion ROM limited to 90° KF x 2 weeks; No OKC quad strengthening (to avoid pull at osteotomy site through patellar tendon); Observe for wound healing.

<table>
<thead>
<tr>
<th>Weight Bearing</th>
<th>Brace</th>
<th>ROM</th>
</tr>
</thead>
<tbody>
<tr>
<td>PWB (≤50% BW)</td>
<td>On &amp; locked at 10-15° KF at all times except w/CPM or P/AAROM exercises</td>
<td>Emphasize full extension</td>
</tr>
<tr>
<td>May stand in tandem for brief periods</td>
<td>Discontinue brace for sleep at 4 weeks per comfort level (unless otherwise instructed by MD)</td>
<td>Progress flexion to ≤90° KF multiple times per day</td>
</tr>
<tr>
<td>Use bilateral axillary crutches or other appropriate assistive device for proper weight bearing</td>
<td>Open when seated</td>
<td>CPM per MD instruction</td>
</tr>
</tbody>
</table>

#### Therapeutic Exercise and Activity

- Establish high quality quad set
  - Superior translation of the patella
  - Avoid co-contraction with hamstrings and proximal gluteal musculature
  - Utilize NMES as needed
- SLR x 4
  - Flexion: begin in standing → reclined standing → supine
    - Progress per quad control, no extensor lag, NO pain at osteotomy site
  - Abduction, Adduction, Extension
- Beginner mat exercises for abdominal/lumbopelvic control and proximal hip strength
- Gentle double legged partial squats to 30° KF max, with support or light leg press with double limb
- Standing TKE with resistance band

**Goals:** Control effusion and pain; ROM 0-90°; Attain a strong quad set; SLR w/NO lag; Able to perform ≥30 reps prior to fatigue w/leg lifting

### Phase II: 4-8 Weeks

**Precautions:** RETURN TO FULL WEIGHT BEARING DICTATED BY MD CLEARANCE AND RADIOGRAPHIC HEALING; No OKC quad through large arc of motion – observe for pain and/or increased pain or swelling at osteotomy site – contact MD if present; No isolated pushing through flexed knee until MD radiographic clearance (i.e. stair climbing or step drills); Avoid end range quad stretching x 8 weeks

---

Jill Monson, PT, OCS  
Liz Niemuth, PT, OCS  
Tibial Tubercle Osteotomy (AMZ)
**Weight Bearing**
- 4-6 weeks – weight bearing as tolerated transitioning to full weight bearing

**Brace**
- On with gait – gradually open per quad control
- Lock outdoors if not confident with surroundings or w/fatigue

**ROM**
- Full extension
- Progress flexion toward full ROM – may initiate stationary bike for ROM

### Therapeutic Exercise and Activity (Phase II continued)
- Initiate bridging with legs over exercise ball/bolster (no plank poses yet)
- Increase repetitions w/proximal hip strength and abdominals
- Initiate basic 2 legged CKC strength drills
  * Shallow (0-45°) KF angles for ↓PFJ stress
- Initiate 2 legged L/E proprio/balance
- Emphasize terminal knee extension control in CKC

**Goals:** Effusion resolving; No pain at osteotomy site; Full extension ROM; Flexion ROM ≥120°; Multi-planar L/E hip strength = MMT grade 5/5

**NOTE:** Pain with weight bearing at osteotomy site dictates slower progression.

---

### Phase III: 8-12 Weeks

**Precautions:** Caution w/extended periods of walking in FWB (per MD ok & symptoms); Maintain effusion/pain control with WB and HEP progression; Avoid pivoting on a planted foot; Instruct proper knee/hip alignment with CKC drills; Observe for quadriceps control of terminal knee extension with CKC drills and ADL mobility

<table>
<thead>
<tr>
<th>Weight Bearing</th>
<th>Brace</th>
<th>ROM</th>
</tr>
</thead>
<tbody>
<tr>
<td>• FWB, unless instructed differently by MD</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
  * Normalize gait pattern, avoiding knee hyperextension in early stance |
  * Return to normal stair climbing (if healing confirmed) | • Open per quad control |
  • Protective use when out of home: environmental hazards, crowds | • Full, symmetrical ROM |

### Therapeutic Exercise and Activity
- Progress core activities – side plank from knees, bridging w/ or w/o ball, basic 2 legged prone plank and hip strength
- Initiate basic low impact cardio with bike, elliptical, walking (15-20 minutes, minimal intensity, steady pace)
- Progress CKC drills – step, lunge, leg press
  * Deeper KF angles (>45°) with 2 legged support |
  * Early KF angles (0-45°) with 1 legged support per control/tolerance |
  * Progress L/E proprio/balance drills: single limb per control/tolerance |

**Goals:** Effusion resolved; No pain at osteotomy site; ROM WNL; Progressing toward normal gait pattern in FWB; Able to perform ≥30 reps prior to fatigue with leg lifting; Normal LE kinematics w/2 legged CKC activities

---

Jill Monson, PT, OCS
Liz Niemuth, PT, OCS

*Tibial Tubercle Osteotomy (AMZ)*
| **Phase IV: 12-16 Weeks*** |  |
|--------------------------|--------------------------|--------------------------|
| **Precautions:** Increased pain at osteotomy site indicates need to reduce level of physical activity (fitness, ADL activity, rehab progression); Observe/instruct proper L/E alignment w/CKC drills (avoid functional valgus); Avoid pivoting on a planted foot |  |
| **Cardiovascular Fitness** | **Proprioception/Balance** | **Core Stability** |
| • Progress low impact cardio per symptoms – increase one variable at a time (intensity level, intervals, duration) | • Progress drills: Add surface challenge/perturbation on DL | • Advance progression of core stabilization and bridging as tolerated |
|  *15-20 min minimal intensity, steady pace to begin | • Single limb activities on level surface |  |
|  | • Directional reaching and stepping drills |  |
| **Strengthening** |  |
| • Increase workload with CKC drills: |  |
|  *Add resistance with 2 legged squatting |  |
|  *Progress depth with single limb (step, lunge, leg press) |  |
|  *Initiate large muscle group weight training (HS curls, leg press, calf raises, dead lift, etc.) |  |
| **Goals:** Restore normal mechanics with single leg CKC activities; Gait speed and distance normalizing; Able to perform 2 legged squat ≥60˚ x 20 reps w/kinematic & symptom control; Able to maintain single leg balance ≥60 seconds; Restore normal stair climbing |  |

*Timeframes in later phases of rehabilitation are estimates only. Patients may be progressed faster/slower based on their ability to attain goals for each phase.*

*Patient to return to University of Minnesota Health Clinics and Surgery Center for physical performance testing at approximately 16 weeks post-surgery*

*Please reference Return to Sport or High Physical Demand Occupation Protocol for return to further advanced activities*