**Physical Therapy Post-Operative Guidelines**

**Tibial Tubercle Osteotomy (Distal/Medial)**

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### 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>
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</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>
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<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>
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**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

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### 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

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**Tibial Tubercle Osteotomy**
### 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:** Distal transfer of tubercle may need extended time to heal. 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>
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<tr>
<th>Weight Bearing</th>
<th>Brace</th>
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</thead>
<tbody>
<tr>
<td>FWB, unless instructed differently by MD</td>
<td>Open per quad control</td>
<td>Full, symmetrical ROM</td>
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<tr>
<td>*Normalize gait pattern, avoiding knee hyperextension in early stance</td>
<td>*Protective use when out of home: environmental hazards, crowds</td>
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<td>*Return to normal stair climbing (if healing confirmed)</td>
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**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

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**Tibial Tubercle Osteotomy**
**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.

<table>
<thead>
<tr>
<th>Cardiovascular Fitness</th>
<th>Proprioception/Balance</th>
<th>Core Stability</th>
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<tr>
<td>• Progress low impact cardio per symptoms – increase one variable at a time (intensity level, intervals, duration) *15-20 min minimal intensity, steady pace to begin</td>
<td>• Progress drills: Add surface challenge/perturbation on DL • Single limb activities on level surface • Directional reaching and stepping drills</td>
<td>• Advance progression of core stabilization and bridging as tolerated</td>
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### 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.*

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