This rehabilitation program is designed to return the individual to their full activities as quickly and safely as possible, following Tibial Tubercle Osteotomy. Modifications to this guideline may be necessary dependent on physician specific instruction or other procedures performed. This evidence-based guideline is criterion-based; time frames and visits in each phase will vary depending on many factors. The therapist may modify the program appropriately depending on the individual’s goals for activity following this surgery.

This guideline is intended to provide the treating clinician a frame of reference for rehabilitation. It is not intended to substitute clinical judgment regarding the patient’s post-operative care based on exam/treatment findings, individual progress, and/or the presence of concomitant procedures or post-operative complications. If the clinician should have questions regarding post-operative progression, they should contact the referring physician.

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| **Phase** | **Suggested Interventions** | **Goals/Milestones for Progression** |
| **Phase I** *Pre Surgery* | *Educate:*

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| Anatomy, existing pathology, post-op rehab schedule, bracing, and expected progressions  |

*Instruct on Pre-Op exercises:*- Home safety- Equipment recommendations*Overview of hospital stay:*

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| -Nursing care -Therapy services -Pharmacy -Discharge planning  |

 | *Goals of Phase:*1. Understanding of pre-op exercises, instructions and overall plan of care

*Criteria to Advance to Next Phase:*1. Surgery
 |
| **Phase II**Immediately Post op  | *Immediate Post-operative instructions:* Patient/family education and training for:- Safety with mobility/transfers- Icing and elevation- Home Exercise Program- Appropriate Home Modifications*Precautions:** Brace locked in extension for gait and activities of daily living (ADL’s). May unlock brace when sitting
* Non-weight bearing or toe touch weight bearing (20%) for the first 6 weeks
* ROM limitations as stated below
* No driving

*Range of Motion:** 0-90° with seated passive range of motion (PROM) or continuous passive motion or assisted wall slides in supine. Avoid active extension

*Suggested therapeutic exercise*- Assisted range of motion (seated knee flexion or supine wall slides) within above guidelines- Knee extension ROM (avoid hyperextension past 5°)- Ankle pumps progressing to resisted ankle ROM- Patellar mobilizations- Quad sets - 10 second sustained- Straight leg raises in multiple directions- Supine wall pushes- Mini squats- Weight shifting drills  | *Goals of Phase:*Functional goals:1. Protection of the post-surgical knee
2. Restore normal knee range of motion (ROM)
3. Normalize gait
4. Eliminate effusion
5. Restore leg control

*Criteria to Advance to Next Phase:*1. Safe gait with crutches and brace unlocked
2. No effusion
3. 0-90 degrees Knee ROM
 |
| **Phase III**Typically 6-8 weeks post op till completion of advancement criteria | *Precautions:** *Avoid over-stressing fixation by beginning close chain movements in a shallow arc of motion (starting 0-30, working up to 0-60) and using un-weighting techniques (pool/ Alter G)*
* *Avoid post-activity swelling*
* *Discontinue brace when patient has good single leg stand control and good quadriceps control*

*Suggested Therapeutic Exercise:** Gait drills (begin with Alter G treadmill or pool)
* Functional single plane closed chain movements (begin with Alter G treadmill pool)
* Continued gradual progression of ROM
* Balance and proprioception exercises
 | *Goals of Phase:*1. Single leg stand control
2. Good control and no pain with short arc functional movements, including steps and partial squat
3. Good quadriceps control

*Criteria to Advance to Next Phase:* 1. Normal gait on level surfaces
2. Good leg control without extensor lag, pain or apprehension
3. Single leg balance greater than 15 seconds
 |
| **Phase IV**Typically 10-12 weeks post op till completion of advancement criteria | *Precautions:** Avoid closed chain exercises on land past 90° of knee flexion to avoid overstressing the repaired tissues and increased PF forces
* Avoid post-activity swelling

*Suggested Therapeutic Exercise:** Continue ROM exercises and stationary bike
* Closed chain strengthening begin with single plane progress to multi-plane
* Single leg press
* Balance and proprioception exercises; single leg stand, balance board
* Hip and core strengthening.
* Stretching for patient specific muscle imbalances
 | Goals of Phase: 1. Normal gait without crutches
2. Full ROM
3. No effusion
4. Improve quadriceps strength
5. Improve proximal hip and core strength
6. Improve balance and proprioception

*Criteria to Advance to Next Phase:* 1. Normal gait without crutches
2. Full ROM
3. No effusion
4. No patellar apprehension
5. Single leg balance with 30° knee flexion greater than 15 seconds
6. Good control and no pain with squats and lunges
 |
| **Phase V**Typically 10-12 weeks post op till completion of advancement criteria | Precautions:* Post-activity soreness should resolve within 24 hours
* Avoid post-activity swelling

*Suggested Therapeutic Exercise:** Impact control exercises beginning 2 feet to 2 feet, progressing from 1 foot to other and then 1 foot to same foot
* Movement control exercise beginning with low velocity, single plane activities and progressing to higher velocity, multi-plane activities
* Sport/work specific balance and proprioceptive drills
* Hip and core strengthening
* Stretching for patient specific muscle imbalances
 | Goals of Phase: 1. Good eccentric and concentric multi-plane dynamic neuromuscular control (including impact) to allow for return to sport/work

Return to Sport/Work:1. Patient may return to sport after receiving clearance from the orthopedic surgeon and the physical therapist/athletic trainer. Progressive testing will be completed. The patient should have less than 15% difference in Biodex strength test, force plate jump and vertical hop tests, and functional horizontal hop tests
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