



**DR. CARL DIRAIMONDO / DR. BRIAN KURCZ / DR. CRAIG OLSON
TIBIAL TUBERCLE TRANSFER POST-OP THERAPY PROTOCOL**

Phase 1 – Maximum Protection Phase (0-6 weeks)

Goals for Phase 1	Precautions for Phase 1
<ul style="list-style-type: none"> • Protect tibial tubercle transfer • Minimize effusion • ROM per guidelines listed, emphasis on extension • Encourage quadriceps function • Scar tissue mobility 	<ul style="list-style-type: none"> • Avoid open/resisted knee extension • Avoid open and closed kinetic chain hip strength (including SLR) • Avoid ambulation without brace locked at 0 degrees for first 4 weeks (pending WB)

Immobilization/Weight Bearing

- TTWB with brace locked in full extension

Range of Motion

- 0-90 degrees, emphasis on extension

Brace

- Brace locked in full extension
- Progression of opening brace is dependent upon controlled pain, appropriate quad strength, and controlled effusion per physician discretion

Manual Therapy

- Scar mobilization
- Patellar mobility drills
- Soft tissue mobilization to hamstrings, quadriceps, gastrocnemius-soleus, IT Band
- PROM/AROM knee flexion per ROM guidelines listed above

Strengthening

- Quadriceps strengthening:
 - **0-6 weeks:** quadriceps setting
 - **2-6 weeks:** terminal knee extension in prone (and standing once WBAT)
- Hip strengthening:
 - Initiate isometrics
- Core strengthening
- Upper body ergometer

Modalities

- Cryotherapy 3x per day for 20 minutes each with knee elevated above heart
- Issue compression and Kinesiotape appropriate for edema
- NMES for quadriceps function:
 - Home NMES unit recommended for first 8 weeks following surgery, per physician and therapist discretion
 - NMES to be used at home 3x a day for 20 minutes each



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Phase 2 – Progressive Range of Motion and Early Strengthening (6-12 weeks)

Goals for Phase 2	Precautions for Phase 2
<ul style="list-style-type: none"> • Minimize effusion • Gently increase ROM to full • Normalize gait with heel-toe pattern • Wean from knee brace • Open and closed kinetic chain strengthening 	<ul style="list-style-type: none"> • Avoid lunges • Avoid overloading surgical site • Avoid deep squatting for 16 weeks (greater than 90°)

Immobilization/Weight Bearing

- WBAT with crutches but can wean from crutches as appropriate

Range of Motion

- Gradual return to full ROM, emphasis on extension, per physician discretion

Brace

- Progression of opening brace is dependent upon controlled pain, appropriate quad strength, and controlled effusion per physician discretion

Manual Therapy

- Scar mobilization
- Patellar mobilization
- Soft tissue mobilization to hamstrings, quadriceps, gastrocnemius-soleus, IT Band
- PROM/AROM knee flexion per ROM guidelines listed above

Strengthening

- Quadriceps strengthening:
 - **6-8 weeks:** begin multi-plane straight leg raising and closed kinetic chain strengthening program
 - **8-10 weeks:** progress open and closed kinetic chain program from bilateral to unilateral
- Hip strengthening:
 - Initiate open kinetic chain progressing to closed kinetic chain multi-plane hip strengthening
- Core strengthening
- Begin stationary bike
- **10 weeks:** initiate proprioception drills
- Blood flow restriction training as appropriate at 10 weeks (sooner with surgeon clearance)

Modalities

- NMES for quadriceps function as indicated per phase 1.



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Phase 3 – Progressive Strengthening (12-16 weeks)

Goals for Phase 3	Precautions for Phase 3
<ul style="list-style-type: none">• Progress muscle strength, endurance, and balance	<ul style="list-style-type: none">• No kicking in pool for 12 weeks• Avoid twisting and pivoting for 12 weeks• Avoidance of impact activity until able to pass functional testing

Stretching

- Continue stretching of all lower extremity musculature as appropriate

Manual Therapy

- As needed to maintain range of motion and flexibility

Strengthening

- Advance open and closed kinetic chain strengthening (avoid knee extensions)
- Increased intensity on bike, treadmill, and elliptical trainer
- Begin gym strengthening leg press, hamstring curls, ab/adduction

Neuromuscular Control

- Increase difficulty and intensity on proprioception drills

Aquatics

- Initiate pool running program



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Phase 4 – Advanced Strengthening and Functional Drills (16-24 weeks)

Goals for Phase 4

- Minimize pain and inflammation
- Restore strength and endurance
- Restore neuromuscular control
- Initiate impact activity and begin sport and/or work specific tasks

16 Weeks

- Continue pool running program advancing to land as tolerated

20 Weeks

- Advance gym strengthening
- Progress running/sprinting program –see return to run protocol
- Begin multi-directional field/court drills
- Begin bilateral progressing to unilateral plyometric drills
- Follow-up appointment with physician

Return to Competition

- Sports testing for return to competition 6 months post-op per physician's release