

## RJAH Tibial Tubercle Transfer/ Osteotomy Rehabilitation Guide

Patient Details:

Co-morbidity:

Note to Therapist:

*\*This is a guide to progression, not an exhaustive list of rehabilitation and does not replace clinical reasoning.*

*\*Treat any soft tissue symptoms on their merit.*

*\*Objective Tests can be used as an indication for progression.*

*\*Special Instruction(s) includes specific post-operative advice for the individual patient based on their surgeon's recommendation (as applicable). This will be completed on discharge or follow-up clinic appointments.*

PHASE OF REHABILITATION	IDEAL CRITERIA	WEIGHT-BEAR	ROM	REHABILITATION GUIDE	GOALS	SPECIAL INSTRUCTION
<p><b>PHASE 1a</b></p> <p><b>From Day 1</b></p>	<ul style="list-style-type: none"> <li>○ Successful operative outcome.</li> <li>○ Adequate pain relief.</li> <li>○ Understands post-op instructions.</li> </ul>	<p>PWB.</p>	<p><b>Dependent on consultant opinion a hinged brace might be prescribed.</b></p> <p>If so this should be locked in E when mobilising. Unlock to allow NWB 0° - 90°.</p>	<ul style="list-style-type: none"> <li>• Cryocuff/Ice.</li> <li>• Active-assisted and active F and E exercises (0° - 90°).</li> <li>• EOR E mobilisations.</li> <li>• Gentle patella mobilisations.</li> <li>• H and calf stretches.</li> <li>• Ankle Exercises (e.g. heel raises).</li> <li>• Isometric Q &amp; H (in brace).</li> <li>• PWB with elbow crutches.</li> </ul>	<ol style="list-style-type: none"> <li>1. Reduce inflammation.</li> <li>2. Gain terminal E.</li> <li>3. Promote distal circulation.</li> <li>4. Gradually regain ROM.</li> <li>5. Increase confidence.</li> <li>6. Promote early mobility.</li> </ol>	<p><b>Check if any specific post-op instructions have been given and amend the guide accordingly.</b></p>

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Author: Andrea Bailey

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PHASE OF REHABILITATION	IDEAL CRITERIA	WEIGHT-BEAR	ROM	REHABILITATION GUIDE	GOALS	OBJECTIVE TEST	SPECIAL INSTRUCTION
<b>PHASE 1b</b>  <b>From Week 1 (OPD Physio)</b>	<ul style="list-style-type: none"> <li>○ Mobilise independently with elbow crutches and brace.</li> <li>○ Adequate pain relief.</li> <li>○ Brace fits effectively.</li> </ul>	PWB.	Hinged brace locked in E when mobilising.  Unlock to allow NWB 0° - 90°.	<ul style="list-style-type: none"> <li>• As above.</li> <li>• Other muscle groups not to be neglected.</li> <li>• Upper body active exercise →resis/reps/sets/speed.</li> <li>• Unaffected limb active exercise →resis/reps/sets/speed.</li> <li>• Core stability exercises as appropriate.</li> </ul>	<ol style="list-style-type: none"> <li>1. Promote early function.</li> <li>2. Increase ROM.</li> </ol>	AROM.  PROM.  Clams.	

PHASE OF REHABILITATION	IDEAL CRITERIA	WEIGHT-BEAR	ROM	REHABILITATION GUIDE	GOALS	OBJECTIVE TEST	SPECIAL INSTRUCTION
<b>PHASE 2</b>  <b>From Week 6</b>	<ul style="list-style-type: none"> <li>○ Clams 10 reps with 10 sec hold ideal control [L] &amp; [R].</li> <li>○ AROM &amp; PROM = 0°-90°.</li> </ul>	Progress to FWB.	Unlimited unless specified.  Wean out of brace.	<ul style="list-style-type: none"> <li>• Gait re-education →predictable changes in direction.</li> <li>• Prone auto-over press F → develop into Q stretch.</li> <li>• Sit → Stand (<b>dependant on check X-ray</b>).</li> <li>• Low step-touch → step-up → step over (<b>dependant on check X-ray</b>).</li> <li>• Lunges - aim for ideal alignment and control (<b>dependant on check X-ray</b>).</li> <li>• Bridges - aim for ideal alignment and control.</li> <li>• Proprioception → single leg stance/wobble boards/Trampoline/crash mats/etc.</li> <li>• Gymball and Theraband work</li> <li>• Lower body active exercise resis/reps/sets/speed.</li> <li>• Core stability exercises as appropriate.</li> <li>• Flexibility exercises as appropriate.</li> <li>• Rowing → dist./speed/resis.</li> <li>• X-Trainer → dist./speed/resis.</li> <li>• Hydrotherapy (<b>except breaststroke leg kick- add from Week 16</b>).</li> </ul>	<ol style="list-style-type: none"> <li>1. Progress functional activities.</li> <li>2. Prevent AKP.</li> <li>3. Prevent scar adherence.</li> <li>4. Prevent joint stiffness.</li> <li>5. Restore normal gait pattern.</li> <li>6. Promote appropriate muscle strength, power and endurance.</li> <li>7. Improve neuromuscular/ proprioception/ sensorimotor performance.</li> <li>8. Maintain cardiovascular fitness.</li> <li>9. Encourage patient compliance.</li> </ol>	<b>AROM – If 90°F is not achieved by week 6 inform surgeon.</b>  PROM.  SLR.  Single Leg Stance.  Clams.  Planks.	<i>Check X-ray &amp; surgeon's satisfaction before progression.</i>

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PHASE OF REHABILITATION	IDEAL CRITERIA	REHABILITATION GUIDE	GOALS	OBJECTIVE TEST	SPECIAL INSTRUCTION
<p><b>PHASE 3</b></p> <p><b>From Week 12</b></p> <p><b>Cont'd overleaf...</b></p>	<ul style="list-style-type: none"> <li>○ SLR with no lag.</li> <li>○ Normal symmetrical gait.</li> <li>○ Full dynamic control - no brace required.</li> <li>○ AROM = Full E - <math>\geq 100^\circ</math>.</li> <li>○ Single leg stance <math>\geq 80\%</math> parity.</li> <li>○ Directional Planks 30 sec hold ideal control.</li> </ul>	<ul style="list-style-type: none"> <li>• Step-ups (for/back/sideways/over) <math>\rightarrow</math> height/reps/speed.</li> <li>• PWB (parallel bars) jumps, hops, leaps <math>\rightarrow</math> control technique/speed/reps.</li> <li>• Leg Press/Squats <math>\rightarrow</math> resis/reps/sets/speed.</li> </ul> <p><i>Sequencing of training:</i></p> <ul style="list-style-type: none"> <li>• Train 3 – 4 x per week.</li> <li>• Train strength and endurance on separate days.</li> <li>• Have a minimum of 24 hours between strength days.</li> <li>• Choose numbers of sets and rest time between sets.</li> <li>• Alternate upper/lower body exercises within session.</li> <li>• Speed of contraction should be moderate to fast, but controlled.</li> <li>• Vary load/set/rest between sessions.</li> <li>• Adjust if necessary based on symptoms.</li> <li>• <i>Strength:</i> 10 – 20 min CV warm-up (<b>exception of jogging/running – until Week 16, surgeon's approval is granted &amp; if adequate strength and control</b>).</li> </ul> <p>Choose a load 1 – 12 RM.</p> <p><b>Cont'd overleaf...</b></p>	<ol style="list-style-type: none"> <li>1. Promote appropriate strength, power and endurance based on individual's needs.</li> <li>2. Improve neuromuscular performance.</li> <li>3. Increase confidence.</li> </ol>	<p>AROM.</p> <p>PROM.</p> <p>Single Leg Squat <math>60^\circ</math>.</p>	<p><i>Avoid deep squats and lunges and heavy Q resis. Until Consultant approval.</i></p>

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**PHASE 3**  
**From Week 12**  
**Cont'd**

- **Endurance:**  
 Gradually progress toward ≥45 min continuous CV exercise (**exception of jogging/running – until Week 16, surgeon’s approval is granted & if adequate strength and control**).  
 Choose a load 15 – 20 RM.

PHASE OF REHABILITATION	IDEAL CRITERIA	REHABILITATION GUIDE	GOALS	OBJECTIVE TEST	SPECIAL INSTRUCTION
<b>PHASE 4</b> <b>From Week 16</b>	<ul style="list-style-type: none"> <li>○ Single Leg Squat 60° 5 sec hold with good alignment.</li> <li>○ No/ minimal pain.</li> <li>○ Full AROM</li> <li>○ Full PROM</li> </ul>	<ul style="list-style-type: none"> <li>• Gradually progress from PWB to FWB and double footed to single footed plyometrics as dictated by <b>surgeon’s approval</b>, neuromuscular control, pain and swelling.</li> <li>• <b>If not already done so, introduce through range OKC Q, progress resis as dictated by symptoms &amp; surgeon’s opinion.</b></li> <li>• Introduce jogging → running on the <b>surgeon’s approval</b> and when Q strength, neuromuscular control, pain and swelling are adequate.</li> </ul>	1. Sport specific function.	AROM.  PROM.  5 RM.  Hop for distance.	

PHASE OF REHABILITATION	IDEAL CRITERIA	REHABILITATION GUIDE	GOALS	OBJECTIVE TEST	SPECIAL INSTRUCTION
Phase 5 From Week 24	<ul style="list-style-type: none"> <li>○ Full pain free AROM.</li> <li>○ 5 RM &gt;80% parity.</li> <li>○ Hop for distance &gt;80% parity.</li> <li>○ <b>Surgeon's approval required.</b></li> </ul>	<ul style="list-style-type: none"> <li>• Progress from jog → run → sprint.</li> <li>• Add agility drills when sufficient control and confidence is achieved e.g. twist/turn/pivot/cut/accelerate/decelerate/direction.</li> <li>Progress from predictable agility to unpredictable.</li> <li>• Advance dynamic proprioceptive exercises e.g. volleying football, throwing, catching, racket and ball while balancing on Trampette.</li> <li>• Perturbation training e.g. therapist randomly nudges patient off balance during a single leg throw-catch drill.</li> <li>• Non-contact sport specific training → terrain/volume/periodisation.</li> </ul>	<p>1. Prepare neuromuscular and psychological ability to return to unrestricted function.</p>	<p>Vertical Jump.</p> <p>As indicated for individuals goals.</p>	

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<b>PHASE 6</b> <b>From Week 24+</b>	<ul style="list-style-type: none"> <li>○ All Tests &gt; 90% parity.</li> <li>○ <b>Dependent on surgeon's approval.</b></li> </ul>	<ul style="list-style-type: none"> <li>● Earliest return to contact sport training.</li> <li>● Progress to full restriction free sports and activities.</li> </ul>	<ol style="list-style-type: none"> <li>1. Unrestricted confident function.</li> <li>2. Injury prevention.</li> </ol>	Full sporting function.	

Terminology Key:

E	Extension	PWB	Partial Weight Bear
F	Flexion	FWB	Full Weight Bear
EOR	End of Range	ROM	Range of Movement
IRQ	Inner Range Quadriceps	AROM	Active Range of Movement
SLR	Straight Leg Raise	PROM	Passive Range of Movement
Q	Quadriceps	OKC	Open Kinetic Chain
H	Hamstrings	resis	Resistance
AKP	Anterior Knee Pain	reps	Repetitions
[L]	Left	RM	Repetition Maximum
[R]	Right	CV	Cardiovascular
PFJ	Patellofemoral Joint		

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