

RJAH High Tibial Osteotomy (HTO) or Distal Femoral Osteotomy (DFO) Rehabilitation Guide

Patient Details:

Co-morbidity (if applicable follow the most conservative guide for the relevant phase):

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 (not exhaustive) can be used as an indication for progression. The choice can be individualised for the patient.*

**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	REHABILITATION GUIDE	GOALS	OBJECTIVE TEST	SPECIAL INSTRUCTION
PHASE 1 From Day 1	<ul style="list-style-type: none"> ○ Successful operative outcome. ○ Adequate pain relief. ○ Understands post-op instructions. 	<ul style="list-style-type: none"> • Weight-bear as symptoms allow, elbow crutches for comfort. • ROM as symptoms allow. • Cryocuff/Ice. • Patella mobilisations. • H and calf stretches. • Ankle Exercises (e.g. heel raises). • SQ. • Weight transferring. 	<ol style="list-style-type: none"> 1. Reduce inflammation. 2. Promote distal circulation. 3. Gradually regain ROM. 4. Increase confidence. 5. Promote early mobility. 		<p>Check if any specific post-op instructions have been given and amend the guide accordingly.</p>

Reviewed: Sept 2018

Author: Andrea Bailey

Applicable for Simon Roberts, Peter Gallacher, Andrew Barnett, Paul Jermin, Richard Roach, Tony Smith, Steve White, unless operation note states otherwise.

PHASE OF REHABILITATION	IDEAL CRITERIA	REHABILITATION GUIDE	GOALS	OBJECTIVE TEST	SPECIAL INSTRUCTION
PHASE 2 From Week 1	<ul style="list-style-type: none"> ○ Adequate pain relief. ○ Mobilise independently +/- aids. 	<ul style="list-style-type: none"> • Static Bike or Turbotrainer no/low resistance as tolerated (part revolution → full revolution as symptoms dictate). • Rowing no/ low resistance for ROM (as symptoms dictate). • Anti-gravity treadmill, walk → jog, increase body weight and speed as symptoms dictate. • EOR E mobilisations. • SQ progressing to SLR. • Mini squats/ small knee bends. • Weight transferring exercises → gradually increase weight-bearing. • Independent gait re-education. • Early proprioception exercises, progressing to single leg stance as symptoms dictate. • Step-touch → step-up → step over. • Active CKC and OKC exercises. • Muscle balance exercises as appropriate. • Core stability exercises as appropriate. • Flexibility exercises as appropriate. • Other muscle groups not to be neglected. • Upper body active exercise → resis/reps/sets/speed. • Hydrotherapy (when wounds allow). 	<ol style="list-style-type: none"> 1. Promote early function. 2. Gain terminal E. 3. Increase ROM. 4. Encourage FWB. 5. Improve muscular control. 	<p>AROM</p> <p>PROM</p> <p>SLR</p> <p>Effusion</p> <p>Single Leg Stance</p> <p>Bridging</p> <p>Clams</p>	<p>Check X-Ray at 6 weeks post-op</p>

Reviewed: Sept 2018

Author: Andrea Bailey

Applicable for Simon Roberts, Peter Gallacher, Andrew Barnett, Paul Jermin, Richard Roach, Tony Smith, Steve White, unless operation note states otherwise.

PHASE OF REHABILITATION	IDEAL CRITERIA	REHABILITATION GUIDE	GOALS	OBJECTIVE TEST	SPECIAL INSTRUCTION
PHASE 3 From Week 6	<ul style="list-style-type: none"> ○ X-Ray results are satisfactory. ○ Minimal discomfort. ○ Resolving effusion. ○ Independent mobility with no aids. ○ SLR with no lag. ○ AROM = Full E - $\geq 100^\circ$. ○ Single leg stance $\geq 80\%$ parity. ○ Clams 10 reps with 10 sec hold ideal control [L] & [R]. ○ Bridge 10 reps with 10 sec hold ideal control. 	<ul style="list-style-type: none"> ● Gait with predictable changes in direction. ● Step-ups (for/back/sideways/over) \rightarrow height/reps/speed. ● PWB (parallel bars) jumps, hops, leaps \rightarrow control technique/speed/reps. ● Leg Press/Squats \rightarrow resis/reps/sets/speed. ● Proprioception \rightarrow single leg stance/wobble boards/Trampoline/crash mats/etc. ● Gymball and Theraband work. ● Rowing \rightarrow dist./speed/resis. ● X-Trainer \rightarrow dist./speed/resis. 	<ol style="list-style-type: none"> 1. Progress functional activities. 2. Prevent AKP. 3. Prevent joint stiffness. 4. Restore normal gait pattern. 5. Promote appropriate muscle strength, power and endurance. 6. Improve neuromuscular/proprioception/sensorimotor performance. 7. Maintain cardiovascular fitness. 8. Encourage patient compliance. 	<p>Planks</p> <p>Hurdle Step</p>	

PHASE OF REHABILITATION	IDEAL CRITERIA	REHABILITATION GUIDE	GOALS	OBJECTIVE TEST	SPECIAL INSTRUCTION
PHASE 3 From Week 8	<ul style="list-style-type: none"> ○ Normal symmetrical gait. ○ Full Active E - $\geq 120^\circ\text{F}$. ○ No/minimal effusion. ○ Directional Planks 30 sec hold ideal control. ○ Controlled hurdle step ≥ 5 reps. 	<ul style="list-style-type: none"> • Train strength and endurance up to 3 – 4 x per week. • Train strength and endurance on separate days. • Have a minimum of 24 hours between strength days • Strength: <ul style="list-style-type: none"> 10 – 20 min CV warm-up (exception of jogging/running, unless using anti-gravity treadmill). Choose a load 1 – 12 RM. Choose numbers of sets and rest time between sets. Alternate upper/lower body exercises within session. Moderate to fast speed under control. Vary load/set/rest between sessions. Adjust if necessary based on symptoms • Endurance: <ul style="list-style-type: none"> Gradually progress toward ≥ 45 min continuous CV exercise (exception of jogging/running, unless using anti-gravity treadmill). Choose a load 15 – 20 RM. Choose numbers of sets and rest time between sets. Alternate upper/lower body exercises within session. Moderate to fast speed under control. Vary load/set/rest between sessions. Adjust if necessary based on symptoms. 	<ol style="list-style-type: none"> 1. Promote appropriate strength, power and endurance based on individual's needs. 2. Improve neuromuscular performance. 3. Increase confidence. 	<p>Inner Range Squat/ Small Knee Bend</p> <p>Rotatory Stability</p> <p>Single Leg Bridge</p>	

PHASE OF REHABILITATION	IDEAL CRITERIA	REHABILITATION GUIDE	GOALS	OBJECTIVE TEST	SPECIAL INSTRUCTION
PHASE 4 From Week 12	<ul style="list-style-type: none"> ○ Inner Range Squat/ Small Knee Bend = ideal biomechanical control. ○ [L] & [R] Rotational Stability $\geq 80\%$ parity. ○ Single Leg Bridge 10 reps with 10 sec hold ideal control. 	<ul style="list-style-type: none"> ● Add FWB double footed plyometrics \rightarrow control technique/speed/reps. 	<ol style="list-style-type: none"> 1. Improve neuromuscular performance. 2. Improve biomechanical control. 3. Improve power. 4. Increase confidence. 	Single Leg Squat 60° Vertical Jump	
PHASE 5 From Week 16 Dependent on the patient's activity and functional goals.	<ul style="list-style-type: none"> ○ Single Leg Squat 60° 5 sec hold with good alignment. ○ Note Vertical Jump Height. 	<ul style="list-style-type: none"> ● Progress to single footed plyometrics as dictated by control and symptoms. ● Introduce jogging \rightarrow running when eccentric strength and control is adequate. ● Advance dynamic proprioceptive exercises e.g. volleying football, throwing, catching, racket and ball while balancing on Trampoline. 	<ol style="list-style-type: none"> 1. Sport specific function. 	Vertical Jump 5 RM Hop for distance Deep Squat Inline Lunge	

PHASE OF REHABILITATION	IDEAL CRITERIA	REHABILITATION GUIDE	GOALS	OBJECTIVE TEST	SPECIAL INSTRUCTION
<p>Phase 6 From Week 20</p> <p>Dependent on the patient's activity and functional goals.</p>	<ul style="list-style-type: none"> ○ Vertical Jump Height – shows improvement. ○ Deep Squat – ideal posture +/- heel raise. 	<ul style="list-style-type: none"> ● Add agility drills [From Week 16] when sufficient control and confidence is achieved e.g. twist/ turn/ pivot/ cut/ accelerate/ decelerate/direction. ● Progress from predictable agility to unpredictable. ● Perturbation training e.g. therapist randomly nudges patient off balance during a single leg throw-catch drill. 	<ol style="list-style-type: none"> 1. As PHASE 5 	As PHASE 5	
<p>PHASE 7 From Week 24</p> <p>Dependent on the patient's activity and functional goals.</p>	<ul style="list-style-type: none"> ○ Vertical Jump Height – shows improvement. ○ 5 RM > 80% parity ○ Hop for distance >80% parity. ○ Inline Squat – ideal movement pattern >80% parity. 	<ul style="list-style-type: none"> ● Non-contact sport specific training → terrain/volume/periodisation. 	<ol style="list-style-type: none"> 1. Prepare neuromuscular and psychological ability to return to unrestricted function. 	As indicated for individuals goals.	
<p>PHASE 8 From Week 28</p> <p>Dependent on the patient's activity and functional goals.</p>	<ul style="list-style-type: none"> ○ All Tests > 90% parity. 	<ul style="list-style-type: none"> ● Contact sport specific training. ● Earliest return to contact sport training. ● Progress to full restriction free sports and activities [dependent on Consultant opinion]. 	<ol style="list-style-type: none"> 1. Unrestricted confident function 2. Injury prevention 	Full sporting Function.	

Reviewed: Sept 2018

Author: Andrea Bailey

Applicable for Simon Roberts, Peter Gallacher, Andrew Barnett, Paul Jermin, Richard Roach, Tony Smith, Steve White, unless operation note states otherwise.

Terminology Key:

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

NOTES:

Reviewed: Sept 2018

Author: Andrea Bailey

Applicable for Simon Roberts, Peter Gallacher, Andrew Barnett, Paul Jermin, Richard Roach, Tony Smith, Steve White, unless operation note states otherwise.