

## RJAH Trochleoplasty Reconstruction 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	REHABILITATION GUIDE	GOALS	OBJECTIVE TEST	SPECIAL INSTRUCTION
<b>PHASE 1</b>  <b>From Day 1</b>	<ul style="list-style-type: none"> <li>○ Successful operative outcome.</li> <li>○ Adequate pain relief</li> <li>○ Understands post-op instructions.</li> </ul>	<ul style="list-style-type: none"> <li>● Cryocuff/Ice.</li> <li>● CPM if available.</li> <li>● Active-assisted and active F and E exercises.</li> <li>● EOR E mobilisations.</li> <li>● H and calf stretches.</li> <li>● Ankle Exercises (e.g. heel raises).</li> <li>● SQ progressing to SLR.</li> <li>● IRQ.</li> <li>● Co-contraction Q and H.</li> <li>● Prone SLR.</li> <li>● Weight transferring.</li> <li>● Elbow crutches for comfort.</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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<p><b>PHASE 2</b></p> <p><b>From Week 1</b></p>	<ul style="list-style-type: none"> <li>○ Full active and passive E.</li> <li>○ Mobilise independently +/- aids.</li> </ul>	<ul style="list-style-type: none"> <li>• Mini squats/ small knee bends.</li> <li>• Static Bike or Turbotrainer no/low resistance as tolerated (part revolution → full revolution as symptoms dictate). <b>DO NOT</b> use cleats or clips on pedals.</li> <li>• Gradually increase weight-bearing</li> <li>• Independent gait re-education.</li> <li>• Other muscle groups not to be neglected</li> <li>• Upper body active exercise → resis/reps/sets/speed.</li> <li>• <b>Contralateral limb strength training</b> <b>3x per week (continue for 10 weeks)</b> <b>Leg Press, Leg Curl &amp; Leg Ext 3 x 5RM.</b></li> </ul>	<ol style="list-style-type: none"> <li>1. Promote early function.</li> <li>2. Increase ROM.</li> <li>3. Encourage FWB.</li> <li>4. Improve muscular control.</li> </ol>	<p>AROM.</p> <p>PROM.</p> <p>SLR.</p>	

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<b>PHASE 3</b>  <b>From Week 2</b>	<ul style="list-style-type: none"> <li>○ FWB.</li> <li>○ SLR no lag.</li> <li>○ AROM = Full E - <math>\geq 100^\circ</math>.</li> </ul>	<ul style="list-style-type: none"> <li>● Patella mobilisations (avoid lateral glides).</li> <li>● Prone auto-over press F → develop into Q stretch.</li> <li>● Gait with predictable changes in direction.</li> <li>● Sit → Stand.</li> <li>● Low step-touch → step-up → step over.</li> <li>● Lunges (aim for ideal alignment and control).</li> <li>● Bridges (aim for ideal alignment and control).</li> <li>● Proprioception → single leg stance/wobble boards/Trampette/crash mats/etc.</li> <li>● Gymball and Theraband work.</li> <li>● Lower body active exercise (<b>exception of OKC Q until Month 3</b>) → resis/reps/sets/speed.</li> <li>● Muscle balance exercises as appropriate.</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>AVOID breaststroke leg kick until Month 3</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>	<p>AROM.</p> <p>PROM.</p> <p>Single Leg Stance.</p> <p>Clam.</p> <p>Planks.</p>	

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<p><b>PHASE 3</b></p> <p><b>From Week 6</b></p>	<ul style="list-style-type: none"> <li>○ Normal symmetrical gait.</li> <li>○ AROM = Full E - <math>\geq 100^\circ</math>.</li> <li>○ <b>AROM – If 90°F is not achieved by week 6 inform Consultant.</b></li> <li>○ Single leg stance <math>\geq 80\%</math> parity.</li> <li>○ Clams 10 reps with 10 sec hold ideal control [L] &amp; [R].</li> <li>○ Directional Planks 30 sec hold ideal control.</li> </ul>	<ul style="list-style-type: none"> <li>● Step-ups (for/back/sideways/over) → height/reps/speed.</li> <li>● PWB (parallel bars, deep water or Anti G) landing drills - jumps, hops, leaps → control technique/speed/reps.</li> <li>● Leg Press/Squats → resis/reps/sets/speed.</li> <li>● Add speed exercises, e.g. prone heel flicks.</li> </ul> <p><i>Sequence Training:</i></p> <ul style="list-style-type: none"> <li>● Train strength and endurance 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> </ul> <p><b>Strength:</b> [Through range OKC Q from week 12] <i>See appendix; Pages 7 – 8</i> Adjust if necessary based on symptoms.</p> <p><b>Hypertrophy:</b> [Through range OKC Q from week 12] <i>See appendix; Pages 7 – 8</i> Adjust if necessary based on symptoms.</p> <p><b>Endurance:</b> [Through range OKC Q from week 12] Gradually progress toward <math>\geq 45</math> min continuous CV exercise (exception of jogging/running) <i>See appendix; Pages 7 – 8</i> Adjust if necessary based on symptoms.</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>Effusion.</p>	<p>Avoid deep squats and lunges if pre-existing PFJ pain and/ or degenerative articular cartilage lesion.</p> <p>Mild/ moderate pain and swelling is common, and consideration to the progression of exercises is based on clinical reasoning and or Consultant guidance.</p>

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<b>PHASE 4</b> <b>From Week 12</b>	<ul style="list-style-type: none"> <li>○ Single Leg Squat 60° 5 sec hold with good alignment.</li> <li>○ No/ minimal effusion.</li> <li>○ No/ minimal pain.</li> </ul>	<ul style="list-style-type: none"> <li>• Gradually progress from PWB to FWB and double footed to single footed landing drills and plyometrics as dictated by neuromuscular control, pain and swelling.</li> <li>• Introduce OKC Q, progress resis as dictated by symptoms.</li> <li>• Introduce jogging → running when Q strength, neuromuscular control, pain and swelling is adequate.</li> </ul>	<ol style="list-style-type: none"> <li>1. Sport specific function.</li> </ol>	<p>AROM.</p> <p>PROM.</p> <p>5 RM.</p> <p>Hop for distance.</p>	
<b>Phase 5</b> <b>From Month 6</b>	<ul style="list-style-type: none"> <li>○ No/ minimal effusion.</li> <li>○ Full pain free AROM.</li> <li>○ 5 RM &gt;80% parity</li> <li>○ Hop for distance &gt;80% parity.</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. 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>	<ol style="list-style-type: none"> <li>1. Prepare neuromuscular and psychological ability to return to unrestricted function.</li> </ol>	<p>As indicated for individuals goals.</p>	

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<b>PHASE 6</b> <b>From Month 12</b>	<ul style="list-style-type: none"> <li>○ All Tests &gt; 90% parity.</li> <li>○ <b>Dependent on Consultant's approval.</b></li> </ul>	<ul style="list-style-type: none"> <li>● Contact sport specific training.</li> <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	RTS	Return to sport

Summary of Post-Operative Restrictions (unless stated otherwise):

Activity	Dictated by <b>sufficient neuromuscular control</b> and time from surgery.
Full weight bearing.	Progression based on symptoms.
Lateral Patella Glides.	From Week 12.
OKC Q.	From Month 3.
Breaststroke Leg Kick.	From Month 3.
High Impact Activities, including jogging.	From Month 3 – 4.
Agility Drills.	From Month 6.
Return to full contact sports.	From Month 12, dependent on specific RTS criteria and MDT opinion.

*Appendix:*

Patient Education.

A **repetition maximum** (RM) is the most weight you **can** lift, push, press or curl for a defined number of exercise movements. For example, a 5RM would be the heaviest weight you could lift for 5 consecutive repetitions. What will dictate your RM is muscle fatigue/ weakness, or you are experiencing pain more than 2-3/10 above your normal baseline (10 = worst pain imaginable, 0 = no pain at all), or you are losing technique/ form.

1 – 5 RM will improve Muscle Strength

6 – 10 RM will improve Muscle Hypertrophy

11 – 15+ will improve Muscle Endurance

**Sets** are a series of reps of an exercise done in sequence (usually with a rest between). For example, 3 x 5 RM would be an exercise you can perform a maximum of 5 consecutive times (see **repetition maximum**), rest and then repeat twice more. Perform **a minimum of two sets** for each exercise.

**Progress:**

As you progress and the loads you are lifting are getting easier, but not easy enough to increase the weight, increase the volume. For example if you are lifting 5RM for 3 Sets, increase the number of sets. When this starts to feel easier reduce the number of sets and try increasing the weight to ensure you remain in the specific training zone for you.

**Recommended Rest times between sets:**

1 – 5 RM, 2 min. rest between sets.

6 – 10 RM, 1 min. rest between sets.

11 – 15 RM, 40 sec. rest between sets.

Particularly when you have 2 mins between sets, you might choose to save time and increase your workout intensity by performing a **Superset**. This can be a combination of two or three different exercises that work opposing muscle groups, or upper and lower body, or left and right limbs, and the exercises are done back to back with no rest in between. For example you may choose to switch between the leg press and the chest press. Working on the chest press during the 2 min. rest on the leg press and vice versa.

**Single Leg and or Arm exercises** will give you an indication of the strength differences between your limbs. It also means the weaker limb cannot be assisted by the stronger limb. If you are performing single limb exercises, make sure the RM is specific for each limb. Remember strengthening your non-injured side will limit the deconditioning of your injured side.

**Circuits** are a collection of exercise sets you repeat without a rest. A rest will be recommended between circuits rounds.

**CV Endurance and Strength** training don't mix. If you want to progress your CV work to more than a 20 min moderate session, don't do this in the same session that you strength train. The benefits of the two exercises counteract with each other, meaning you will not strengthen as quickly. If you want to progress you CV do so on a separate day.