

RJAH PCL (Autograft or Allograft) 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
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"> • Cryocuff/Ice. • Patella mobilisations. • H and calf stretches [care if H graft]. • Ankle Exercises (e.g. heel raises). • SQ progressing to SLR. • Prone SLR. • Abduction/ Adduction exercises. • Weight transferring. • Elbow crutches for comfort. 	<ol style="list-style-type: none"> 1. Reduce inflammation. 2. Gain terminal E. 3. Promote distal circulation. 4. Increase confidence. 5. Promote early mobility. 		<p>Check if any specific post-op instructions have been given and amend the guide accordingly.</p> <p>Brace locked at 0° (Avoid HE).</p>

PHASE OF REHABILITATION	IDEAL CRITERIA	REHABILITATION GUIDE	GOALS	OBJECTIVE TEST	SPECIAL INSTRUCTION
PHASE 2 From Week 1	<ul style="list-style-type: none"> ○ Full active and passive E. ○ Mobilise independently +/- aids. 	<ul style="list-style-type: none"> • Gradually increase weight-bearing. • Independent gait re-education. • SKB, facilitate ideal biomechanical alignment. • Low step-touch → step-up. • Proprioception exercises. • Active OKC Q. • Early protected CKC exercises <45°F. • Other muscle groups not to be neglected. • Upper body active exercise → resis/reps/sets/speed. • Contralateral limb strength training 3x per week (continue for 10 weeks) Leg Press, Leg Curl & Leg Ext 3 x 5RM. 	<ol style="list-style-type: none"> 1. Promote early function. 2. Increase ROM. 3. Encourage FWB. 4. Improve muscular control. 	<p>AROM.</p> <p>PROM.</p> <p>SLR.</p> <p>Effusion.</p>	<p>Gradually increase ROM of the hinged brace, up to 90°F.</p> <p>Limit to 60°F during active and resisted exercises.</p> <p>Avoid OKC H.</p>

PHASE OF REHABILITATION	IDEAL CRITERIA	REHABILITATION GUIDE	GOALS	OBJECTIVE TEST	SPECIAL INSTRUCTION
PHASE 3 From Week 4	<ul style="list-style-type: none">Minimal discomfort.FWB.SLR with no lag.AROM = Full E - ≥60°.	<ul style="list-style-type: none">Gait with predictable changes in directionProne auto-over press F → develop into Q stretch.Mini-squats → heel raise.Inner range lunges, facilitate ideal neuromuscular control.Bridging, double footed → single leg → step → gymball.Arabesque exercises with support → increasing weight held out in front.Proprioception → single leg stance/wobble boards/Trampoline/crash mats/etc.Lower body active exercise [exception of OKC H. Respect Q or H graft site as applicable] → resis/reps/sets/speed.Core stability exercises as appropriate.Flexibility exercises as appropriate.Static bike or turbotrainer, no resis.Rowing, no resis.X-Trainer, no reis.	<ol style="list-style-type: none">Progress functional activities.Prevent AKP.Prevent scar adherence.Prevent joint stiffness.Restore normal gait pattern.Promote appropriate muscle strength, power and endurance.Improve neuromuscular/ proprioception/ sensorimotor performance.Maintain cardiovascular fitness.Encourage patient compliance.	<p>Single Leg Stance.</p> <p>Clam.</p> <p>Planks.</p>	<p>No limit to PROM.</p> <p>Limit to 60°F during active and resisted exercises.</p> <p>Avoid OKC H.</p>

PHASE OF REHABILITATION	IDEAL CRITERIA	REHABILITATION GUIDE	GOALS	OBJECTIVE TEST	SPECIAL INSTRUCTION
PHASE 3 From Week 6	<ul style="list-style-type: none"> Normal symmetrical gait. Full PROM. No/minimal effusion Single leg stance ≥80% parity. Clams 10 reps with 10 sec hold ideal control [L] & [R]. Directional Planks 30 sec hold ideal control. 	<ul style="list-style-type: none"> Step-ups (for/back/sideways/over) → height/reps/speed. PWB (parallel bars, deep water or AlterG) landing drills - jumps, hops, leaps. Facilitate ideal alignment and control. Aim to progress to FWB by Week 10. Add speed exercises, e.g. prone heel flicks, Trampoline high knees, Trampoline heel flicks. <p><i>Sequence Training:</i></p> <ul style="list-style-type: none"> Train strength and endurance 3 – 4 x per week. Train strength and endurance on separate days. Have a minimum of 24 hours between strength days. Strength: [Include OKC H from week 12] <i>See appendix; Pages 8 – 9</i> Adjust if necessary based on symptoms. Hypertrophy: [Include OKC H from week 12] <i>See appendix; Pages 8 – 9</i> Adjust if necessary based on symptoms. Endurance: [Include OKC H from week 12] Gradually progress toward ≥45 min continuous CV exercise (exception of jogging/running). <i>See appendix; Pages 8 – 9</i> Adjust if necessary based on symptoms. 	<ol style="list-style-type: none"> Promote appropriate strength, power and endurance based on individual's needs. Improve neuromuscular performance. Increase confidence. 	<p>Single Leg Squat 60°.</p> <p>AROM.</p>	<p>Gradually wean off brace by Week 8, if isolated PCL.</p> <p>Gradually wean off brace by Week 12, if combined PCL and post-lateral corner procedure was performed.</p> <p>No limit to AROM.</p> <p>Limit resisted OKC H until Week 10.</p>

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PHASE 4 From Week 12	<ul style="list-style-type: none"> ○ Single Leg Squat 60° 5 sec hold with good alignment. • Solid end point to reverse Lachman's and LCL test. • Full AROM. 	<ul style="list-style-type: none"> • Standing leg curls, progressing to "Heel flicks". • Ecc H, e.g. Nordic curls. • Progress to single footed plyometrics as dictated by control. • Introduce jogging → running when strength and control is adequate. • Dynamic hydrotherapy. • Advance dynamic proprioceptive exercises e.g. volleying football, throwing, catching, racket and ball while balancing on Trampoline. 	1. Sport specific function.	Tuck Jump. 5 RM. Hop for Distance.	
Phase 5 From Month 6	<ul style="list-style-type: none"> ○ Tuck Jump ≥ 60% quality ○ 5 RM > 80% parity ○ Hop for distance >80% parity. ○ Proprioception 90% parity. 	<ul style="list-style-type: none"> • 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. • Perturbation training e.g. therapist randomly nudges patient off balance during a single leg throw-catch drills. 	1. As PHASE 4.	As PHASE 4.	

PHASE 6 From Month 9	<ul style="list-style-type: none"> ○ As PHASE 4. 	<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.
PHASE 7 From Month 9+	<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.

Terminology Key:

Abd	Abduction	LCL	Lateral Collateral Ligament
Add	Adduction	OKC	Open Kinetic Chain
AKP	Anterior Knee Pain	PCL	Posterior Cruciate Ligament
AROM	Active Range of Movement	PWB	Partial Weight Bear
CV	Cardiovascular	PROM	Passive Range of Movement
E	Extension	Q	Quadriceps
Ecc	Eccentric	[R]	Right
EOR	End of Range	reps	Repetitions
F	Flexion	resis	Resistance
FWB	Full Weight Bear	RM	Repetition Maximum
H	Hamstrings	ROM	Range of Movement
IRQ	Inner Range Quadriceps	SLR	Straight Leg Raise
[L]	Left	SQ	Static Quadriceps
RTS	Return to Sport	MDT	Multidisciplinary Team

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

Activity	Dictated by sufficient neuromuscular control and time from surgery.
Weight bearing	Progress as symptoms allow.
Through range OKC H	From 10 – 12 Weeks.
High impact activities	From 3 Months.
Return to full contact sport/ no restrictions	From Month 9 – 12 Months, if meets all specific RTS criteria and MDT approval.

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.