



## **Sports Knee Rehabilitation**

### **POST-OPERATIVE DAYCASE ACL RECONSTRUCTION PROTOCOL**

**Patients will have undergone prehabilitation with screening  
This protocol is followed with hamstring, allograft and quads tendon reconstructions**

**IKDC – These will be given to patient at the time of listing, at 3, 6 and 12 months post op**

#### **Overall aims**

**Ensure patient achieves milestone prior to progression  
Patient will enter the advanced class at the physiotherapists discretion but will need screening prior to entering the class  
No return to contact sports prior to 6 months post-op  
Return to gentle non-contact, non-competitive sports at physiotherapist's discretion but must be over 5 months post-op**

#### **Immediate post op management**

**Patient will have cryotherapy immediately post op in recovery and will be discharged with a cryo cuff and machine to use for as long and as often as necessary at the physiotherapists discretion  
Physio to see post op and discharge on the day of surgery with crutches and FWB as tolerated  
Follow up physio to be arranged for circa 1 week post op  
Patient will be seen in surgeons clinic at 2-3 weeks post op and will be expected to have full extention**

#### **Rehabilitation**

##### **PHASE 1 POST-OP – Post ACL reconstructive surgery (day 1-10)**

<b>Goal</b>	<b>Treatment</b>	<b>Milestone to Progress</b>
Minimise swelling and pain	<ul style="list-style-type: none"><li>• Use of cryotherapy</li><li>• Ensure adequate pain relief</li><li>• Elevate leg</li><li>• Use of crutches</li></ul>	<ul style="list-style-type: none"><li>• Minimal or no effusion</li><li>• Full or nearing full extension</li><li>• 90° knee flexion</li><li>• SLR with no lag (10 reps)</li></ul>
Regain full range of extension/hyperextension (compare to non-operative knee)	<ul style="list-style-type: none"><li>• Extension exercises: static quads, heel props, prone hanging</li></ul>	<ul style="list-style-type: none"><li>• Normal, symmetrical gait pattern with or without crutches</li></ul>

	<ul style="list-style-type: none"> <li>• Passive stretching</li> </ul>	
Increase knee flexion as pain allows	<ul style="list-style-type: none"> <li>• Active flexion exercises</li> <li>• Passive flexion over edge of bed</li> <li>• Patella mobilisations</li> </ul>	
Improve quads control and hamstring strength	<ul style="list-style-type: none"> <li>• Static quads, SLRs. <b>Ensure patient can SLR with no lag</b></li> <li>• Co-contraction quads and hams</li> <li>• Hamstring curls</li> </ul>	
Ensure flexibility	<ul style="list-style-type: none"> <li>• Hamstring and calf stretches</li> </ul>	
Restoration of normal gait pattern	<ul style="list-style-type: none"> <li>• Gait re-ed with elbow crutches, WB as pain allows</li> <li>• Weight transferring</li> </ul>	

**PHASE 2 – Upon achievement of phase 1 goals: approximately day 10 – 6 weeks**

<b>Goal</b>	<b>Treatment</b>	<b>Milestone to Progress</b>
Minimise swelling and pain (ensure no swelling before progression) Prevent anterior knee pain	<ul style="list-style-type: none"> <li>• Continue as above, as necessary</li> <li>• Patella mobilisations</li> </ul>	<ul style="list-style-type: none"> <li>• Minimal/no effusion</li> <li>• Full range of extension</li> <li>• Normal gait pattern without crutches</li> <li>• Full range of flexion</li> <li>• Single leg stand eyes shut at least 5 seconds</li> <li>• Bilateral squat, thighs parallel to floor with even, symmetrical weight bearing</li> </ul>
Regain/maintain full range of extension/hyperextension (compare to non-operative knee)	<ul style="list-style-type: none"> <li>• Extension exercises as above</li> <li>• Passive stretching</li> </ul>	
Restoration of normal gait pattern	<ul style="list-style-type: none"> <li>• Ensure FWB, wean off crutches</li> </ul>	
Regain full range of flexion	<ul style="list-style-type: none"> <li>• Active flexion exercises</li> <li>• Progress to quads stretch</li> </ul>	
Improve quads, hamstring and general lower limb strength	<ul style="list-style-type: none"> <li>• CKC – wall slide squats with gym ball, squats, lunges, leg press, dips etc.</li> <li>• Hamstring curls, bridging</li> <li>• Calf raises, hip extensions, hip abd/add, VMO, glut med</li> </ul>	
Increase aerobic capacity	<ul style="list-style-type: none"> <li>• Exs bike</li> <li>• Treadmill walking</li> <li>• Step ups</li> </ul>	

	<ul style="list-style-type: none"> <li>• Cross trainer</li> <li>• Rower</li> </ul>	
Improve proprioception	<ul style="list-style-type: none"> <li>• Single leg stand eyes open/eyes closed</li> <li>• Wobble board</li> <li>• Sitfit</li> <li>• Trampette</li> </ul>	
Neuromuscular control	<ul style="list-style-type: none"> <li>• Core stability work</li> <li>• Knee alignment/prevent valgus – squats, lunges, step ups (ensure good hip/knee/ankle alignment)</li> </ul>	

**PHASE 3 – Upon achievement of phase 2 goals: approximately week 6-12**

<b>Goal</b>	<b>Treatment</b>	<b>Milestone to progress</b>
Control activity related swelling and pain	<ul style="list-style-type: none"> <li>• Use of cryotherapy post exercise if knee swells with increased activity</li> </ul>	<ul style="list-style-type: none"> <li>• Minimal/no activity related effusion</li> <li>• Full ROM</li> <li>• Normal gait and stair pattern – good alignment and control</li> <li>• 10 x single leg squats to 60° with good biomechanical alignment and control (i.e. no valgus and good hip/knee/ankle alignment)</li> </ul>
Regain/maintain full range of movement	<ul style="list-style-type: none"> <li>• Continue stretches</li> </ul>	
Normalise gait and stair pattern	<ul style="list-style-type: none"> <li>• Treadmill walking – forward/backward/incline</li> </ul>	
Improve quads, hamstring, and general lower limb strength	<ul style="list-style-type: none"> <li>• Continue CKC – double &amp; single leg press, squats, lunges, increase weight</li> <li>• Hamstring curls – double &amp; single leg, increase weight</li> <li>• Calf, gluteals, adductors, VMO strengthening</li> </ul>	
Increase aerobic capacity	<ul style="list-style-type: none"> <li>• Exs bike</li> <li>• Treadmill walking</li> <li>• Step ups</li> <li>• Cross trainer</li> <li>• Rower</li> <li>• Pool walking/running</li> </ul>	
Improve proprioception	<ul style="list-style-type: none"> <li>• Single leg stand eyes closed</li> </ul>	

	<ul style="list-style-type: none"> <li>• Wobble board</li> <li>• Sitfit</li> <li>• Trampette</li> </ul>	
Neuromuscular control	<ul style="list-style-type: none"> <li>• Core stability work</li> <li>• Knee alignment/prevent valgus as above – add trunk rotation</li> </ul>	
Commence bilateral load acceptance/ early plyometrics	<ul style="list-style-type: none"> <li>• Bilateral drop jumps</li> <li>• Jumps with symmetrical squat landing</li> <li>• Progress to straight line jogging when good load acceptance</li> </ul>	

**PHASE 4 – Upon achievement of phase 3 goals**

<b>Goal</b>	<b>Treatment</b>	<b>Milestone to progress</b>
No swelling or pain	<ul style="list-style-type: none"> <li>• Continue as above if necessary</li> </ul>	<ul style="list-style-type: none"> <li>• Normal straight line running pattern</li> <li>• Single leg press &gt;75% body weight</li> <li>• Single leg stand eyes shut &gt;80% unaffected leg</li> <li>• Hop tests &gt;80% LSI: single hop, triple hop, cross over hop, 6m timed hop</li> </ul>
Normal straight line running pattern without pain and in full control	<ul style="list-style-type: none"> <li>• Progress from jogging to running</li> <li>• Increase speed/distance</li> <li>• Change surface/incline</li> <li>• Forward running/backward running</li> </ul>	
Increase muscle strength and endurance	<ul style="list-style-type: none"> <li>• Increase load on strengthening exs (60-80% 1RM)</li> <li>• Single leg press – push for &gt;75% x body weight</li> <li>• Commence open chain quads and gradually increase resistance</li> </ul>	
Improve proprioception	<ul style="list-style-type: none"> <li>• Increase dynamic proprioception</li> </ul>	
Progress bilateral load acceptance/commence unilateral load acceptance/plyometrics	<ul style="list-style-type: none"> <li>• Tuck jumps with stable landing</li> <li>• Squat jumps, forward/ back/ rotational</li> <li>• Bilateral plyometric static and multi-plane exs</li> <li>• Single leg hop with controlled landing</li> <li>• Forward, side hops/ drops from step with controlled single leg landing</li> <li>• Unilateral plyometric static and multi plane activities</li> </ul>	

**PHASE 5 SPORTS SPECIFIC – Upon achievement of phase 4 goals**

Goal	Treatment	Milestone to progress
Increase muscle strength and endurance	<ul style="list-style-type: none"> <li>• Increase load on resistance work</li> </ul>	<ul style="list-style-type: none"> <li>• Symptom free sports specific training</li> <li>• Hop tests &gt;85% LSI : single hop, triple hop, cross over hop, 6m timed hop</li> <li>• Single leg stand eyes shut, equal to unaffected side</li> </ul>
Progress unilateral load acceptance and work to fatigue	<ul style="list-style-type: none"> <li>• As above – increase speed/intensity to fatigue</li> </ul>	
Commence sports specific running agility drills	<ul style="list-style-type: none"> <li>• Sprinting</li> <li>• Cutting and pivoting</li> <li>• Acceleration/deceleration</li> </ul>	
Commence sports specific skills	<ul style="list-style-type: none"> <li>• Ball skills</li> <li>• Dribbling</li> <li>• Boxing</li> <li>• Kicking</li> <li>• Sports specific activity with controlled opposition e.g. one on one practice drills</li> </ul>	
Neuromuscular control following fatigue	<ul style="list-style-type: none"> <li>• Ensure ability to control alignment under random practice and after fatigue</li> </ul>	
Return to non-contact sports (only when nearing 6months post-op)	<ul style="list-style-type: none"> <li>• Golf/swimming/gentle racquet sports</li> </ul>	

**PHASE 6 FULL UNRESTRICTED SPORTS TRAINING– Upon achievement of phase 5 goals: USUALLY AT LEAST 6 MONTHS POST-OP**

Goal	Treatment
Symptom free training	<ul style="list-style-type: none"> <li>• Full, unrestricted training</li> </ul>
ROM and muscular flexibility equal to other side	<ul style="list-style-type: none"> <li>• Continue stretching</li> </ul>
Good results of all functional testing	<ul style="list-style-type: none"> <li>• Functional tests prior to returning to contact sports</li> </ul>
Return to full unrestricted, confident activity	<ul style="list-style-type: none"> <li>• Progress to uncontrolled practice situations and competition</li> </ul>

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