

POST-OPERATIVE ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION PROTOCOL

| PHASE OF REHABILITATION | STAGE OF GRAFT REMODELLING | IDEAL CRITERIA | REHABILITATION GUIDE | GOALS |
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| <p>PHASE 0 Pre-operative</p> | | <p>Checklist</p> <ul style="list-style-type: none"> <input type="checkbox"/> Full ROM especially extension <input type="checkbox"/> Functional quads strength and activation <input type="checkbox"/> Minimal effusion <input type="checkbox"/> Normal Gait pattern | <ul style="list-style-type: none"> • AROM/PROM flexion and extension • CKC leg strengthening • Proprioceptive training • Education about surgery and post-surgical rehab | <ol style="list-style-type: none"> 1. Regain as much function as possible pre-operatively 2. Return to low level activity which involves <u>no</u> cutting or contact |
| <p>PHASE 1 Discharge to 10 days</p> | <p>The graft is at its strongest immediately post surgery, with respect to the soft tissue.</p> <p>No initial blood supply to graft, results in avascularisation of the soft tissue aspect.</p> | <p>Checklist</p> <ul style="list-style-type: none"> <input type="checkbox"/> Week 1 full active and passive ext. <input type="checkbox"/> Week 2 SLR <input type="checkbox"/> Flexion 0-90° <input type="checkbox"/> No Quads lag <input type="checkbox"/> SLR with no lag. <input type="checkbox"/> 2 Crutches-1 crutch | <ul style="list-style-type: none"> • No CPM • Brace-optional Locked 0-90° for walking • Cryocuff/ Ice. • Patella mobilizations. • EOR E mobilizations • Hamstring (H) and calf stretches. • Ankle exercises. • Passive F over edge of bed. • Static quadriceps (Q). • Co-contraction Q and H. • Avoid 'heavy' eccentric Q, which may overload the harvest site. • Prone H, con/ecc/isomet. • SLR. • Mini squats. • Heel raises. • Static bike no/low resis. as tolerated. • Other muscle groups not to be neglected. • 1 foot standing • Weightbearing as tolerated with crutches | <ol style="list-style-type: none"> 1. Reduce inflammation. 2. Gain full terminal E 3. Promote distal circulation. 4. Gradually regain ROM. 5. Introduce early Quads/Hams work. 6. Promote early mobility. 7. Promote early function 8. Improve Muscular strength/endurance and control 9. Encourage Weight-bearing. |

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| <p>PHASE 2 Day 10-Week 6</p> | <p>Avascularization of graft leads to continual decrease in graft strength. The graft becomes enveloped in a synovial sheath.</p> | <p>Checklist</p> <ul style="list-style-type: none"> <input type="checkbox"/> Minimal discomfort. <input type="checkbox"/> SLR with no lag. <input type="checkbox"/> AROM = Full E – 120° <input type="checkbox"/> Mobilize independently +/- aids | <ul style="list-style-type: none"> • FWB. • Continue ROM ex's • Gait with predictable changes in direction. • Prone auto-overpress/belt Flexion →develop Q stretch • Step ups (for/back/sideways) →height/reps/resis/speed. • Leg press →reps/resis/speed. • Progress proprioception →wobble boards/sit-fit/trampoline/crash mats/etc. • Gym ball, Theraband work • Hydrotherapy/swimming (AVOID breaststroke legs until 3 month stage) • Progress general leg exercises VMO, ab/adduction,gluteals, etc. • Muscle balance as appropriate. • Flexibility as appropriate. I.e. standing stretches hams/gastroc/soleus | <ol style="list-style-type: none"> 1. Progress functional activities. 2. Prevent anterior knee pain. 3. Prevent scar adherence. 4. Prevent joint stiffness 5. Restore normal gait pattern. 6. Promote appropriate muscle strength/power and endurance. 7. Improve proprioception. 8. Maintain cardiovascular fitness. 9. Encourage patient compliance. |
| <p>PHASE 3 From Week 6-12</p> | <p>Bone blocks unite with surrounding bone and revascularisation of the graft commences. An increase in graft laxity is usually apparent on testing between ~ week 10-12.</p> | <p>Checklist</p> <ul style="list-style-type: none"> <input type="checkbox"/> 'Normal' gait pattern, pain free. <input type="checkbox"/> ROM 0-140° <input type="checkbox"/> 1 leg balance ~1 min. <input type="checkbox"/> Normal Patellar Glide | <ul style="list-style-type: none"> • Progress above as able. • Trampoline jogging. • Treadmill-walking with increasing incline, straight-ahead jogging progressing to running • Lunges, lunge walking, fwd/backward, clock-face lunges • Stairmaster • Fitter side/side • Isokinetic H. | <ol style="list-style-type: none"> 1. Continue to promote specific function. 2. Increase muscle work and control through range. 3. Full pain free ROM 4. Advance proprioception 5. Isometric quad strength= 75-85% |

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| <p>PHASE 4 From Month 3- Month 6</p> | <p>By month 4 complete revascularization with the laying down of collagen occurs. A gradual increase in strength is gained as the graft remodels.</p> | <p>Checklist</p> <ul style="list-style-type: none"> <input type="checkbox"/> H ~90% of contra-lateral side. <input type="checkbox"/> Adequate dynamic proprioception. <input type="checkbox"/> Restoration of normal running stride | <ul style="list-style-type: none"> • Isokinetic Quads • OKCQuads → reps/resis/speed /con/ecc/isomet • Plyometrics, drops from 6-18"/ bounding, etc. • Hopping → stride/direction/stops/ speed. • Jogging → Running Surface/distance • Progress to incorporate: Agility, run/ sprint/cut/ pivot/ accelerate/ decelerate. | <ol style="list-style-type: none"> 1. Bias to specific function/sport. 2. Sport Specific quad/ham strengthening 3. Sport Specific Cardio fitness 4. Sport Specific Proprioception 5. Continue Flexibility/strengthening lower chain 6. Back to sport practice for skills as able (between 4-6 months) |
| <p>Phase 4 (Cont) From Month 5</p> | | <p>Checklist</p> <ul style="list-style-type: none"> <input type="checkbox"/> 80-90% isomet. and isokin. Quads strength of contra-lateral side. <input type="checkbox"/> Proprioception ~90% contra-lateral side. | <ul style="list-style-type: none"> • Non-contact training. • Non-contact sport. | <ol style="list-style-type: none"> 1. Prepare physical and psychological ability for complete return to unrestricted function. |
| <p>PHASE 5 From Month 6</p> | <p>Gradual organisation of collagen. At 1 year the graft resembles the appearance of a ligament with densely organized collagen bundles. Graft strength is thought to range from 30-60% of the original. The laxity of the graft appears to be linked with muscle strength.</p> | <p>Checklist</p> <ul style="list-style-type: none"> <input type="checkbox"/> 90% isometric and isokinetic testing of quads for amateur athlete <input type="checkbox"/> 80% isometric and isokinteic testing of quads for professional athlete <input type="checkbox"/> Symptom free training. <input type="checkbox"/> Minimal laxity and effusion <input type="checkbox"/> No patellofemoral or soft tissue complications <input type="checkbox"/> Physician clearance to resume full activity | <ul style="list-style-type: none"> • Earliest return to contact sport. • Functional bracing for first 1-2 years after surgery | <ol style="list-style-type: none"> 1. Safe Return to Sport |

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