POST-OPERATIVE MULTI-LIGAMENT RECONSTRUCTION PROTOCOL: COMBINED ANTERIOR CRUCIATE LIGAMENT AND MEDIAL COLLATERAL LIGAMENT

Ensure patient achieves milestone prior to progression
No return to contact sports prior to 9 months post-op
Return to gentle non-contact, non-competitive sports at physiotherapist’s discretion but must be over 8 months post-op
Any problems during rehabilitation please contact Jo Armstrong or Dan Wright at Wrightington Physiotherapy Department 01257 256533

PHASE 1 POST-OP – Post reconstructive surgery (day 1-14)

<table>
<thead>
<tr>
<th>Goal</th>
<th>Treatment</th>
<th>Milestones to Progress</th>
</tr>
</thead>
</table>
| Graft protection            | • Cricket pad splint to be worn at all times when mobilizing and for sleeping  
                              | • Use of crutches **TOUCH WB ONLY**                                         | • Ensure patient has attended first post-operative clinic review (at 2 weeks post-op) |
| Minimise swelling and pain  | • Use of ice or Game Ready if available  
                              | • Elevate leg  
                              | • Ensure adequate pain relief                                                     |
| Prevent post-operative complications | • Circulatory exercises  
                                       | • Patella mobilizations                                                        |
| Maintain muscle strength    | • Regular static quads  
                              | • SLR if able                                                               |

PHASE 2  2 weeks to 6 weeks

<table>
<thead>
<tr>
<th>Goal</th>
<th>Treatment</th>
<th>Milestone to Progress</th>
</tr>
</thead>
</table>
| Graft protection            | • Hinged knee brace (no limit to extension, flexion limited to 90°) to be worn at all times when mobilizing. Cricket pad splint to be worn in bed  
                              | • Use of crutches **PARTIAL WB ONLY**                                        | • Minimal effusion  
                              | • Full or nearing full extension  
                              | • 90° knee flexion  
                              | • SLR with no lag (10 reps)  
                              | • Normal, symmetrical gait pattern with crutches                           |
| Minimise swelling and pain  | • Use of ice or Game Ready  
<pre><code>                          | • Ensure adequate pain relief                                                |
</code></pre>
<table>
<thead>
<tr>
<th>Regain full range of extension/hyperextension (compare to non-operative knee)</th>
<th>Elevate leg</th>
<th>Ensure patient has attended their 6 week clinic review</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase knee flexion as pain allows</td>
<td>Extension exercises: static quads, heel props, prone hanging, Passive stretching</td>
<td>Active flexion exercises, Passive flexion over edge of bed, Patella mobilisations</td>
</tr>
<tr>
<td>Improve quads control and muscle strength</td>
<td>Static quads, SLRs. <strong>Ensure patient can SLR with no lag</strong></td>
<td>Co-contraction quads and hams, Hamstring curls, Early gluteal strengthening, Early core stability strengthening</td>
</tr>
<tr>
<td>Ensure flexibility</td>
<td>Hamstrings and calf stretches</td>
<td></td>
</tr>
<tr>
<td>Restoration of normal gait pattern</td>
<td>Gait re-education with elbow crutches, PWB</td>
<td></td>
</tr>
<tr>
<td>Attention to donor leg if graft harvested from contralateral side</td>
<td>Restore full range of motion ASAP, Commence muscle strengthening, Commence muscle stretching</td>
<td></td>
</tr>
</tbody>
</table>

**PHASE 3 6 weeks – 12 weeks**

<table>
<thead>
<tr>
<th>Goal</th>
<th>Treatment</th>
<th>Milestone to Progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graft protection</td>
<td>Hinged knee brace (no restriction to ROM) to be worn at all times when mobilizing.</td>
<td>Minimal/no activity related effusion, Full range of extension, Normal gait pattern without crutches, Full range of flexion, Single leg stand eyes shut at least 5 seconds, Bilateral squat, thighs parallel to floor with even, symmetrical weight bearing, <strong>Ensure patient has attended 12 week clinic review</strong></td>
</tr>
<tr>
<td>Minimise swelling and pain (ensure no swelling before progression) Prevent anterior knee pain</td>
<td>Continue as above, as necessary, Patella mobilisations</td>
<td></td>
</tr>
<tr>
<td>Regain/maintain full range of extension/hyperextension (compare to non-operative knee)</td>
<td>Extension exercises as above, Passive stretching</td>
<td></td>
</tr>
<tr>
<td>Restoration of normal gait pattern</td>
<td>Commence FWB, wean off crutches</td>
<td></td>
</tr>
<tr>
<td>Regain full range of flexion</td>
<td>Active flexion exercises with overpressure, Progress to quads stretch, Passive stretching as required, Hydrotherapy as required</td>
<td></td>
</tr>
<tr>
<td>Improve quads, hamstring and general lower limb strength</td>
<td>CKC – wall slide squats with gym ball, squats, lunges, leg press, single leg squats etc.</td>
<td></td>
</tr>
</tbody>
</table>
- Hamstring curls, bridging
- Calf raises, hip extensions, hip abd/add, glut med/max

**Increase aerobic capacity**
- Exs bike
- Treadmill walking (incline)
- Step ups
- Cross trainer
- Rower

**Improve proprioception**
- Single leg stand eyes open/eyes closed
- Wobble board
- Sitfit
- Trampette

**Neuromuscular control**
- Core stability work
- Knee alignment/prevent hip IR/knee valgus – squats, lunges, step ups (ensure good hip/knee/ankle alignment)

**PHASE 4 – Upon achievement of phase 3 milestones: from 12 weeks**

<table>
<thead>
<tr>
<th>Goal</th>
<th>Treatment</th>
<th>Milestone to progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control activity related swelling and pain</td>
<td>• Use of cryotherapy post exercise if knee swells with increased activity</td>
<td>• Minimal/no activity related effusion</td>
</tr>
<tr>
<td>Regain/maintain full range of movement</td>
<td>• Continue stretches</td>
<td>• Full ROM</td>
</tr>
<tr>
<td>Normalise gait and stair pattern</td>
<td>• Discontinue brace on instruction at 12 week clinic review (continue with brace if patient has not attended clinic).</td>
<td>• Normal gait and stair pattern – good alignment and control</td>
</tr>
<tr>
<td></td>
<td>• Treadmill walking – forward/backward/incline</td>
<td>• 10 x single leg squats to 60° with good biomechanical alignment and control (i.e. no valgus and good hip/knee/ankle alignment)</td>
</tr>
<tr>
<td>Improve quads, hamstring, and general lower limb strength</td>
<td>• Continue CKC – double &amp; single leg press, squats, single leg squats, lunges, increase weight</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Hamstring curls – double &amp; single leg, increase weight</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Gluteals, calf, adductors</td>
<td></td>
</tr>
<tr>
<td>Increase aerobic capacity</td>
<td>• Exs bike</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Treadmill walking</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Step ups</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Cross trainer</td>
<td></td>
</tr>
</tbody>
</table>
**Improve proprioception**
- Rower
- Pool walking/running

**Neuromuscular control**
- Core stability work
- Knee alignment/prevent valgus as above – add trunk rotation

**Commence bilateral load acceptance/ early plyometrics**
- Bilateral drop jumps
- Jumps with symmetrical squat landing
- Progress to straight line jogging when good load acceptance

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**PHASE 5 – Upon achievement of phase 4 milestones**

<table>
<thead>
<tr>
<th>Goal</th>
<th>Treatment</th>
<th>Milestone to progress</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No swelling or pain</strong></td>
<td>Continue as above if necessary</td>
<td><strong>Normal straight line running pattern</strong></td>
</tr>
<tr>
<td><strong>Normal straight line running pattern without pain and in full control</strong></td>
<td>Progress from jogging to running, Increase speed/distance, Change surface/incline, Forward running/backward running</td>
<td><strong>Single leg press &gt;75% body weight</strong></td>
</tr>
<tr>
<td><strong>Increase muscle strength and endurance</strong></td>
<td>Increase load on strengthening exs (60-80% 1RM), Single leg press – push for &gt;75% x body weight, Commence open chain quads and gradually increase resistance</td>
<td><strong>Single leg stand eyes shut &gt;80% unaffected leg</strong></td>
</tr>
<tr>
<td><strong>Improve proprioception</strong></td>
<td>Increase dynamic proprioception, Tuck jumps with stable landing, Squat jumps, forward/ back/ rotational, Bilateral plyometric static and multi-plane exs, Single leg hop with controlled landing, Forward, side hops/ drops from step with controlled single leg landing, Unilateral plyometric static and multi plane activities</td>
<td><strong>Hop tests &gt;85% LSI: single hop, triple hop, cross over hop, 6m timed hop, side to side hop</strong></td>
</tr>
</tbody>
</table>
### PHASE 6 SPORTS SPECIFIC – Upon achievement of phase 5 milestones

<table>
<thead>
<tr>
<th>Goal</th>
<th>Treatment</th>
<th>Milestone to progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase muscle strength and endurance</td>
<td>• Increase load on resistance work</td>
<td>• Symptom free sports specific training&lt;br&gt;• Hop tests &gt;90% LSI: single hop, triple hop, cross over hop, 6m timed hop, side to side hop&lt;br&gt;• Single leg stand eyes shut, equal to unaffected side</td>
</tr>
<tr>
<td>Progress unilateral load acceptance and work to fatigue</td>
<td>• As above – increase speed/intensity to fatigue</td>
<td></td>
</tr>
<tr>
<td>Commence sports specific running agility drills</td>
<td>• Sprinting&lt;br&gt;• Cutting and pivoting&lt;br&gt;• Acceleration/deceleration</td>
<td></td>
</tr>
<tr>
<td>Commence sports specific skills</td>
<td>• Ball skills&lt;br&gt;• Dribbling&lt;br&gt;• Boxing&lt;br&gt;• Kicking&lt;br&gt;• Sports specific activity with controlled opposition e.g. one on one practice drills</td>
<td></td>
</tr>
<tr>
<td>Neuromuscular control following fatigue</td>
<td>• Ensure ability to control alignment under random practice and after fatigue</td>
<td></td>
</tr>
<tr>
<td>Return to non-contract sports (only when nearing 8 months post-op)</td>
<td>• Golf/gentle racquet sports</td>
<td></td>
</tr>
</tbody>
</table>

### PHASE 7 FULL UNRESTRICTED SPORTS TRAINING – Upon achievement of phase 6 milestones: MUST BE AT LEAST 9 MONTHS POST-OP

<table>
<thead>
<tr>
<th>Goal</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptom free training</td>
<td>• Full, unrestricted training</td>
</tr>
<tr>
<td>ROM and muscular flexibility equal to other side</td>
<td>• Continue stretching</td>
</tr>
<tr>
<td>Good results of all functional testing</td>
<td>• Functional tests prior to returning to contact sports</td>
</tr>
<tr>
<td>Return to full unrestricted, confident activity</td>
<td>• Progress to uncontrolled practice situations and competition</td>
</tr>
</tbody>
</table>
References


