**Phase I: 0-2 Weeks**

**Precautions:** NO active hamstring strengthening x 6 weeks. Avoid tibial external rotation, and external rotation of the foot/ankle, especially in sitting.

<table>
<thead>
<tr>
<th>Weight Bearing</th>
<th>Brace</th>
<th>ROM</th>
<th>Therapeutic Exercises</th>
</tr>
</thead>
</table>
| TTWB           | • Hinged knee brace locked at 0 degrees extension  
                 • For PCL-R, knee immobilizer for first week with towel behind knee.  
                 Transition to PCL Jack brace at 1 week  
                 • No motion x 2 weeks |
|                |       |     | • Ankle pumps  
                 • SLR abduction brace on  
                 • SLR extension brace on in standing  
                 • Quad sets – NMES as needed  
                 • Glute sets  
                 • Patellar mobilizations |

**Goals:** Edema and pain control. Promote quadriceps activation.

**Phase II: 3-6 Weeks**

**Precautions:** NO active hamstring strengthening x 6 weeks. Avoid tibial external rotation, and external rotation of the foot/ankle, especially in sitting.

<table>
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</table>
| TTWB           | • Locked at 0 degrees extension for ambulation and sleeping  
                 • Non-PCL: hinged brace unlocked 0-90 when sitting  
                 • PCL-R: Jack brace worn at all times except during PT  
                 • 0-90  
                 • Begin with prone passive knee flexion to minimize HS activation |
|                |       |     | • Initiate Basic Core Stability Poses  
                 *Minimize HS activation  
                 • Increase reps w/proximal hip/abdom exercises  
                 • Patellar mobilizations  
                 • Quad sets  
                 • SLR flexion when appropriate quad activation present  
                 • SLR abduction and extension brace on per quad control |

**Goals:** Improving ROM to 90 deg. Edema control.
## Phase III: 7-12 Weeks

**Precautions:** Stationary bike – keep foot forward to minimize HS work. If soreness or effusion present, decrease time/days on bike. Avoid tibial external rotation, and external rotation of the foot/ankle, especially in sitting.

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>• Progress gradually TTWB-&gt;WBAT</td>
<td>• Non-PCL: open brace per quad control; discharge hinged brace when able to demonstrate sufficient gait mechanics</td>
<td>Full, symmetrical ROM</td>
<td>• Progress core poses Basic⇒Intermediate</td>
</tr>
<tr>
<td>*Normalize gait pattern, avoiding knee hyperextension in early stance</td>
<td>• PCL-R: continue with Jack brace through 12 weeks</td>
<td></td>
<td>• Progress L/E proprio/balance drills: single limb per control/tolerance</td>
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<td></td>
<td>• Protective use when out of home: environmental hazards, crowds</td>
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<td>• Initiate HS strengthening CKC only</td>
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<td></td>
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<td>• Stationary bike once 105 degrees KF is attained</td>
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<td>• Calf raises, progress to single leg</td>
</tr>
</tbody>
</table>

**Phase III Goals:** Effusion resolved; ROM 0-125; Progressing toward normal gait pattern in FWB; Able to perform ≥30 reps prior to fatigue w/leg lifting.

## Phase IV: 13-16 Weeks

**Phase IV Precautions:** For PCL-R, discharge Jack brace when able to ambulate without gait deviation. Per surgeon on step down to smaller hinged brace. Avoid tibial external rotation, and external rotation of the foot/ankle, especially in sitting. All weight bearing exercises not to exceed 70 degrees KF.

<table>
<thead>
<tr>
<th>Cardiovascular Fitness</th>
<th>Proprioception/ Balance</th>
<th>Core Stability</th>
<th>Strength</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Initiate basic cardio with bike, elliptical, walking (15-20 min. minimal intensity, steady pace)</td>
<td>Progress drills: -Add Surface Challenge/Perturbation in bilateral support • Single limb activities on level surface</td>
<td>•Intermediate⇒Advanced Core poses per control</td>
<td>• Progress CKC drills to 1 leg per control/symptoms not exceeding 70 deg KF</td>
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<td></td>
<td>• Initiate basic large muscle group weight training: 2 leg support</td>
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<td>• Leg press up to 25% BW to fatigue – KF to 70 deg</td>
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<td>• Squat rack up to 50% BW, not exceeding 70 deg KF; slow progression to full BW</td>
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<tr>
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<td>• CKC progression: DL squatting, lunges, SL squatting, etc.</td>
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</tbody>
</table>
| | | | • Daily biking or swimming (no

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**Multi-Ligament Knee Reconstruction**
**Phase IV Goals:** Restore normal mechanics with double and single leg CKC activities, Gait speed & distance normalizing; Able to perform 2 leg squat 60° x 20 reps w/kinematic & symptom control; Able to maintain single leg balance ≥ 60 sec.; Restore normal stair climbing.

**Conduct Level I (Return to Function) Lower Extremity Physical Performance Testing**

**Goal = Achieve ≥85% LSI w/Level I Test Activities**

**Phase V: 17-24 Weeks**

**Precautions:** Observe for return of effusion and/or pain with increased activity levels; Observe kinematic control w/CKC activities. Closely observe/instruct alignment with plyometric, agility, cutting and sport drills; Modify intensity of exercises per symptoms and L/E alignment control; Advise return to running per criteria below**

**Cardiovascular Fitness**

- Progress cardio with bike, elliptical, walking (20-30 minutes, moderate intensity, steady pace, daily)
- Initiate running program if scores ≥ 85% w/Level II Testing

**Proprioception/Balance**

- Add Surface Challenge or Perturbation
- BOSU, Dynadisc, trunk and/or extremity movement, perturbation
- 2→1 limb support
- 1 leg stance w/surface challenge/perturbation
- 1 leg stance w/sport simulation activity
- Dynamic movement elements:
  - Dot drills
  - Reaching drills
- Add resistance band at U/E or L/E for challenge

**Core Stability**

- Advanced Core poses per control
- Add challenge w/Exercise/BOS U ball under legs/trunk
- Add dynamic mvmt, plyometric elements

**Strength**

- Reps to fatigue w/CKC strength drills (squat, lunge) per symptoms for muscular endurance
- Progress CKC drills with directional challenge (lunging, resisted side stepping)
- Progress weight training to single leg (First eccentric phase only, then both eccen/conc)
- May begin OKC hamstring strengthenning
- Initiate basic 2 leg plyometric drills (emphasize controlled landing into deep squat with good alignment)
- Initiate basic agility/footwork drills (initiate quick foot chopping, feet and hips move together, no pivoting on a planted foot)

**Phase V Goals:** Quad girth returning; Normalized walking speed and distance; Restore normal stair climbing; Able to perform 2 leg squats to 60° KF x 20 reps w/proper alignment (per symptoms); Able to perform a single leg squat ≥45° knee flexion with normal mechanics; Improving low-impact cardio base

**Conduct Level II (Return to Fitness) Lower Extremity Physical Performance Testing**

**Goal = Achieve ≥85% LSI w/Level II Test Activities**
*Time frames in later phases of rehab are estimates only. Patients may be progressed faster/slower based on their ability to attain goals for each phase.*

**Note: Return to running should be based on the following criteria:**
1) Chondral health at the Patellofemoral/Tibiofemoral joints
2) Previous history of regular running
3) Level II PPT scores ≥ 85%
4) Effusion resolution and normal ROM

<table>
<thead>
<tr>
<th>Phase VI: 24+ weeks*</th>
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<tr>
<td><strong>Precautions:</strong> Observe for return of effusion and/or pain with increased activity level and modify HEP; Closely observe alignment with plyometric, agility, cutting and sport drills</td>
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<tr>
<td>• 25-40 minute workout (moderate intensity) w/3-5 brief near-maximal intensity bursts w/recovery periods</td>
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</table>
| • Once able to run x 20 minutes symptom-free, initiate sprint drills  
  - Linear  
  - Focus on acceleration phase  
  - Progress % intensity per fatigue, symptoms  
  • Continue regular cardio workouts 4-6x/wk |
| • Blend strength elements (CKC L/E, OKC U/E) into balance drills per control  
  • Continue to progress dynamic challenge elements |
| • Blend upper body/lower body strengthening elements into core stability poses |
| • Progress plyometrics:  
  - Increase intensity  
  - 2→1 leg take-off/land  
  - Traveling  
  - Direction change  
  - Surface challenge on landings (BOSU)  
  • Progress agility/footwork drills:  
  - Increase % intensity/speed |

**Goals:** Normal quad girth; Able to perform 2 leg squat to 90° x 20 reps & 1 leg squat ≥60° KF x 20 reps w/kinematic & symptom control; Good self-awareness of proper kinematics w/CKC drills. Patient to become independent with exercise program and demonstrate good self-awareness of proper L/E alignment with high level drills

**Conduct Level III (Return to Sport) Lower Extremity Physical Performance Testing**

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Multi-Ligament Knee Reconstruction
Phase VII: 24+ Weeks*

**Precautions:** Observe for return of effusion and/or pain with increased activity level and modify HEP; Closely observe alignment with plyometric, agility, cutting and sport drills

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<td>• Continue regular cardio workouts 4-6x/wk</td>
<td>• Blend strength elements (CKC L/E, OKC U/E) into balance drills per control</td>
<td>• Blend upper body/lower body strengthening elements into core stability poses</td>
<td>• Progress plyometrics: -Increase intensity -2→1 leg take-off/land -Traveling -Direction change -Surface challenge on landings (BOSU)</td>
</tr>
<tr>
<td>• Progress sprint drills: -Increase % intensity -Add direction change in acceleration</td>
<td>• Continue to progress dynamic challenge elements</td>
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<td>• Progress agility/footwork drills: -Increase % intensity/speed</td>
</tr>
<tr>
<td>• Add deceleration drills -Add direction change in deceleration</td>
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</table>

**Goals:** Patient to become independent with exercise program and demonstrate good self-awareness of proper L/E alignment with high level drills. LSI >85% on PPT. Satisfactory varus stress xrays.

**Conduct Level III (Return to Sport) Lower Extremity Physical Performance Testing**

**Note: Return to sport based on the following criteria:**

1) MD clearance at 8-12 months
2) Level III PPT scores ≥ 85% LSI, 3) Preserved symptom control w/sport