

Non-Operative Management – PCL Sprain

Anticipated Return to play

- Grade 1 – 2-4 weeks with functional brace
 - Grade 2 – 4-6 weeks with functional brace
 - Grade 3 – 6-12 weeks with functional brace
- Progression through phase 1-4 is based on severity of sprain combined with tolerance to exercise progression.

Phase I – Maximum Protection

Max protection phase

- Grade 1: 1-2 weeks
- Grade 2: 2-4 weeks
- Grade 3: 6 weeks

Brace – Remove for ROM exercises

- Grade 1: Brace locked in extension 1-2 weeks
- Grade 2: Brace locked in extension for 2-4 weeks
- Grade 3: Brace locked in extension for 6 weeks

Weight Bearing

- Grade 1: WBAT
- Grade 2: 50% x 1-2 weeks
- Grade 3: 50% x 2 weeks

Goals:

- Reduce inflammation with ice/cryocuff, compression, and elevation
- Normalize gait mechanics using crutches
- Normalize patella mobility with manual mobilizations
- Full extension
- Prone Knee flexion 0-90°
 - Begin immediately - grade 1 and 2
 - Begin at 10-14 days - grade 3

Therapeutic Exercise:

- Quadriceps setting, using NMES as needed. Focus on gaining volitional control as early as possible. Place small towel behind tibia to reduce posterior tibial translation.
- Multi-plane open kinetic chain hip strengthening exercises (i.e. – straight leg raises)
- Range of motion:
 - Knee flexion:
 - Prone knee flexion to 90°
 - Seated at edge of plinth with therapist assisted anterior tibial glide
 - Knee extension
 - full; avoid hyperextension

Requirements for progression to phase II

- Good quadriceps function
- Normalize patellar mobility/tracking
- Full extension
- 90° flexion prone
- Reduced swelling and pain

Phase II – Progressive Stretching and Early Strengthening

Goals:

- Open brace gradually - 45°, 60°, 90° as quad function allows
- Full knee ROM
- Normalize gait mechanics
- Normalize patellofemoral joint mobility
- Normalize patellofemoral tracking with CKC loading

Therapeutic Exercise:

- **ROM:**
 - Flexion – flexion off table, heel or wall slides
- **Strengthening:**
 - Weighted straight leg raises
 - Body weight squats
 - Step-up progression
 - Multi-plane open and closed kinetic chain hip strengthening
 - Monster walks
 - Bridging on ball with knee in extension
 - Calf raises
 - Proprioception drills
- **Cardiovascular exercise (low intensity):**
 - Begin stationary bike
 - Shallow water pool program; working on gait mechanics, squats and step-ups.
 - Deep water pool program; cycling and alternating leg kicks.

Requirements for progression to phase III

- Full ROM
- Normal gait pattern
- Normal patellofemoral mobility and tracking
- Good alignment and control with bilateral squatting and step-up progression.

Phase III – Advance Strengthening and Endurance Training

Goals:

- Fit functional brace at approximately quadriceps tone has returned
- Normalize gait and Patellofemoral tracking
- Progressive strengthening
- Increase muscular endurance
- Basic impact loading

Cardiovascular exercise:

- Stationary bike, elliptical, walking and pool program, 20-30 minutes, 5x/week.
- Once gait normalizes retrograde elevated treadmill work to increase eccentric quadriceps strengthening

Therapeutic Exercise:

- Global LE stretching program.
- Foam roller and massage stick to maintenance soft tissue between PT appointments
- Weighted squat and leg press progression, add resistance as tolerated
- Unilateral leg press
- Step up progression with gradual advancement to lunge progression (reverse, walking, split-squats. dips)
- Begin resisted hamstrings strengthening with hamstring curls, RDL's and/or glut ham machine (grade 3 – after 6 weeks)
- Controlled movement series for dynamic stretching, balance, and stability
- Interval programs on the bike and elliptical – 2-3x/week
- Functional running cord progression – forward, backward and lateral

- Basic ladder series
 - Forward
 - Lateral
 - Iky Shuffle
- Shallow water running program
- Begin single response bilateral jumps working on proper take off and landing mechanics. Instruct the patient/athlete on proper sagittal and frontal plane alignment to avoid tibial shear and valgus collapse. Take-off and landing should be taught with hip flexion, knee flexion and ankle dorsiflexion (flat foot landing) DF/FF; this position creates/teaches the optimal take-off and landing position to dampen vertical load by optimally distributing load to the gluts, hamstrings, quadriceps and gastrocnemius.

Functional Progression:

- Swimming freestyle
- Outdoor biking
- Outdoor hiking – easy trails, use poles on the descent – with brace
- Hang cleans and push press – begin with light weight, focus on form – with brace.

Requirements for progression to phase IV

- Full ROM
- Normal patellofemoral tracking
- Good eccentric control with bilateral and unilateral CKC progression
- Good tolerance to basic impact loading progression
- Demonstrates increasing muscular endurance

Phase IV – Advance Strengthening and Running Progression:

Therapeutic Exercise:

- Full gym program as outlined in phase 3 with increasing resistance. Progress resistance LE strengthening program, may add leg extensions at 30° to 0° (exclude patients with patellar or trochlear groove chondral pathology)
 - Linear running progression
 - Jump progression using boxes, hurdles and/or ladders (begin with 30 progressing to 100 jumps)
 - Single response jumps – bilateral take off and landing
 - Single response jumps – Unilateral take off and bilateral landing
 - Single response jumps – Bilateral take off and unilateral landing
 - Single response jumps – unilateral take off and landing
 - Multiple response jumps – bilateral take off and landing
 - Multiple response jumps – unilateral take off and landing
- *** must use proper sagittal and frontal plane alignment along with DF/FF jump/landing mechanics.

Return to Sport and Functional Drills:

- Interval golf program
- Interval skiing program
- Sport specific field/court drills with brace on
- Sports Test for return to full competition
- Follow-up with Physician

Requirements for Return to Play/Discharge:

- Strength at least 90 % of uninvolved limb with functional sports test (see appendix)
- Increasing ligamentous stability
- Completion of sport specific Return to Play program (see appendix)
- Final evaluation and clearance by physician

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