POSTERIOR CRUCIATE LIGAMENT RECONSTRUCTION REHABILITATION PROTOCOL

This rehabilitation protocol has been developed for the patient who has posterior cruciate ligament (PCL) reconstruction using a secure graft with internal fixation. The PCL reconstruction rehabilitation is unique in that extreme knee flexion places a higher amount of stress on the newly reconstructed PCL. Therefore, there are several activities that should be avoided early post-operatively with a PCL reconstruction, for best results, avoid:

- Isolated hamstring activity including curls, isometric, and intense stretching

- Open chain active knee extension from 90-70°, knee extension from 70-0° is allowed with adequate strength and full range knee extension is allowed 6 weeks post-op

- Flexion should be gained with passive wall slides to avoid active hamstring contraction

This protocol is divided into several phases according to postoperative weeks and each phase has anticipated goals for the individual patient to reach. When the goals of the phase have been accomplished, the next phase may begin. Each individual patient may meet these goals at different times based on individual issues and special circumstances. The overall goals of the reconstruction and the rehabilitation are to:

- Control joint pain, swelling, hemarthrosis

- Regain normal knee range of motion

- Regain normal gait pattern and neuromuscular stability for ambulation

- Regain normal lower extremity strength

- Regain normal proprioception, balance, and coordination for daily activities

- Achieve the level of function based on the orthopedic and patient goals

The physical therapy is to begin 2nd day post-op. It is extremely important for the supervised rehabilitation to be supplemented by a home fitness program where the patient performs the given exercises at home or at a gym facility. Important post-op signs to monitor:
• Swelling of the knee or surrounding soft tissue

• Abnormal pain response, hypersensitive

• Abnormal gait pattern, with or without assistive device

• Limited range of motion

• Weakness in the lower extremity musculature (quadriceps, hamstring)

• Insufficient lower extremity flexibility

**Return to activity** requires both time and clinical evaluation. To safely and most efficiently return to normal or high level functional activity the patient requires adequate strength, flexibility, and endurance. Isokinetic testing and functional evaluation are both methods of evaluating a patient’s readiness to return to activity.
Phase 1: Week 1-2  
PCL Reconstruction

**WEEK 1-2  EXERCISE GOAL**

**ROM 0-30°**  
Passive, 0-30°  
Patella mobs  
Ankle pumps  
Gastroc/soleus stretching

**STRENGTH**  
Quad sets with e-stim/biofeedback  
Active knee extension (30-0°)  
SLR (flex, abd, add)

**WEIGHT BEARING**  
WBAT with 2 crutch and brace

**BRACE**  
Limited from 0-30°

**MODALITIES**  
E-stim/biofeedback as needed  
Ice 15-20 minutes

**GOALS OF PHASE:**  
• ROM 0-30°  
• Control pain, inflammation, and effusion  
• Independent in HEP  
• Adequate quad/VMO control  
• WBAT with crutches and brace
Phase 2: Week 2-6
PCL Reconstruction

WEEK EXERCISE GOAL
2-6 ROM 0-90° (wk 4)
- Passive, 0-90° (wk 4) 0-110° (wk 6)
- 0-110° (wk 6)
- Patella mobs
- Ankle pumps
- Initiate light hamstring stretch
- Gastroc/soleus/ITB stretch
- Wall slides to reach goal

STRENGTH
- Quad sets with biofeedback
- SLR (flex, abd, add) with weight/tubing
- Multi-angle isometrics (70-0°)
- Knee extension (70-0°)
- Initiate mini-squats (0-30°)
- Initiate leg press/total gym (0-60°)
- Multi-hip in 4 directions
- Heel raise/Toe raise
- Wall squats (0-30°)

BALANCE TRAINING
- Weight shift (side-to-side, fwd/bkwd)
- Single leg balance work
- Hesitation/Cup walking
- Steam boats balance work
- BICYCLE
- May begin when 110° flexion is reached

WEIGHT BEARING
- FWB with/without crutches as strength allows FWB

BRACE
- Continue with brace, unlocked to 90° 0-90° (wk 4)

MODALITIES
- E-stim/biofeedback as needed
- Ice 15-20 minutes

GOALS OF PHASE:
- ROM 0-110°
- WBAT to FWB
- Control pain, inflammation, and effusion
- Increase lower extremity strength
- Enhance proprioception, balance, and coordination
Phase 3: Week 6-12
PCL Reconstruction

WEEK  EXERCISE GOAL
6-12   ROM 0-135°
     Passive, 0-135°
     Patella mobs
     Hamstring/ITB stretch
     Gastroc/Soleus stretch
     Wall slides to reach goal

STRENGTH
Continue with all strengthening activities from above phases
Initiate lateral/fwd step-ups/downs
Initiate knee extension 90°
Bike/EFX for endurance
Reverse lunges-knee not to migrate over toe
Smith press squats at wk 8

BALANCE TRAINING
Single leg balance with plyotoss
Wobble board balance activities
½ Foam roller balance activities
Sportscord balance/agility work

BRACE D/C (wk 6)
Discharge post-op brace at week 6
Functional brace to be fitted

MODALITIES
Ice 15-20 minutes

GOALS OF PHASE:
• ROM 0-135°
• Increase lower extremity strength and endurance
• Control pain, inflammation, and effusion
• Maximize proprioception, balance, and coordination
Phase 4: Week 12-36
PCL Reconstruction

WEEK EXERCISE
12-36 ROM
Continue with all stretching activities

STRENGTH
Continue with all strengthening activities
increasing all weight and repetitions
Progress with all single leg activity

BALANCE TRAINING
Continue with advanced balance/agility training
Single leg work on advanced surfaces

RUNNING PROGRAM
Initiate running on minitramp and progress to treadmill as tolerated
Backward walking on treadmill

AEROBIC CONDITIONING
Walking program
Swimming program (kicking)
Bike for strength and endurance
EFX for strength and endurance

FUNCTIONAL TRAINING
Lateral movements (slide board, shuffles)
Initiate light plyometrics/agility drills
High speed training
Initiate sport specific training
Carioca, figure 8's

MODALITIES
Ice 15-20 minutes

GOALS OF PHASE:
• Maximize lower extremity strength and endurance
• Return to previous activity level
• Return to specific functional level