

# POSTERIOR CRUCIATE LIGAMENT RECONSTRUCTION REHABILITATION PROTOCOL

Dr. Walter R. Lowe

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 2<sup>nd</sup> 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.

**Dr. Walter R. Lowe  
Phase 1: Week 1-2  
PCL Reconstruction**

<b>WEEK</b>		<b>EXERCISE</b>	<b>GOAL</b>
1-2	ROM	Passive, 0-30° Patella mobs Ankle pumps Gastroc/soleus stretching	0-30°
	STRENGTH	Quad sets with e-stim/biofeedback Active knee extension (30-0°) SLR (flex, abd, add)	
	WEIGHT BEARING	WBAT with 2 crutch and brace	WBAT
	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 as noted by Dr. Lowe

**Phase 2: Week 2-6  
PCL Reconstruction**

<b>WEEK</b>	<b>EXERCISE</b>	<b>GOAL</b>
2-6	<p>ROM</p> <p>Passive, 0-90° (wk 4) 0-110° (wk 6)</p> <p>Patella mobs</p> <p>Ankle pumps</p> <p>Initiate light hamstring stretch</p> <p>Gastroc/soleus/ITB stretch</p> <p>Wall slides to reach goal</p> <p>STRENGTH</p> <p>Quad sets with biofeedback</p> <p>SLR (flex, abd, add) with weight/tubing</p> <p>Multi-angle isometrics (70-0°)</p> <p>Knee extension (70-0°)</p> <p>Initiate mini-squats (0-30°)</p> <p>Initiate leg press/total gym (0-60°)</p> <p>Multi-hip in 4 directions</p> <p>Heel raise/Toe raise</p> <p>Wall squats (0-30°)</p> <p>BALANCE TRAINING</p> <p>Weight shift (side-to-side, fwd/bkwd)</p> <p>Single leg balance work</p> <p>Hesitation/Cup walking</p> <p>Steam boats balance work</p> <p>BICYCLE</p> <p>May begin when 110° flexion is reached</p> <p>WEIGHT BEARING</p> <p>FWB with/without crutches as strength allows    FWB</p> <p>BRACE</p> <p>Continue with brace, unlocked to 90°</p> <p>MODALITIES</p> <p>E-stim/biofeedback as needed</p> <p>Ice 15-20 minutes</p>	<p>0-90° (wk 4) 0-110° (wk 6)</p> <p>0-90° (wk 4)</p>

**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**

<b>WEEK</b>	<b>EXERCISE</b>	<b>GOAL</b>
6-12	ROM 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 90-0° 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 Discharge post-op brace at week 6 Functional brace to be fitted  MODALITIES Ice 15-20 minutes	0-135°

D/C (wk 6)

**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**  
12-36

**EXERCISE**

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