

PCL TEAR: NONOPERATIVE MANAGEMENT

Physical Therapy Protocol

For isolated PCL tears, grades I to III, with no posterolateral corner or collateral ligament instability on exam.



Stanford
MEDICINE

Dear Colleague,

I appreciate your partnership in the rehabilitation of this very special patient of ours. I have instructed the patient that you will be using this protocol. My belief is that the biggest predictor of success is what the patient does at home and consistently. **They should view you not just as a therapist but as a highly educated and skilled teacher** and the patient *must* be an active participant in the rehab process.

To facilitate this, I have included a copy of the rehab protocols I would like the patient to focus on at each time point in the rehab process. Please assist me by encouraging and teaching our mutual patient their home exercises as well.

With your help and the active participation of our patient, I know we can have another fantastic knee.

Please do not hesitate to reach out directly to me and my team with any questions at any time.

Respectfully,



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	WEEKS 0-6	WEEKS 6-12	WEEKS 13-18	WEEKS 19+
PT visits	2x/week	1-2x/week <i>Home program focus</i>	1-2x/week <i>Home program focus</i>	1-2x/week <i>Home program focus</i>
Weight bearing	PWB 2 wks <i>Then progress to WBAT</i>	WBAT <i>Wean crutches</i>	Full	Full
Range of motion	Prone PROM 0-90° <i>2 wks, then full</i>	Full <i>Supine and prone</i>	Full	Full
Brace	PCL brace <i>All times, incl. sleep</i>	PCL brace <i>All times</i>	D/C <i>After at least 12 wks</i>	None
Hamstrings	No isolated work	Knee straight only <i>Ball bridges, SLDL</i>	Isolated work <i>After week 12</i>	Continue
Strengthening	Quad sets, SLR <i>Hip, calf, core</i>	Leg press, squats <i>0-70° only, 3x20</i>	Beyond 70° <i>Single leg</i>	Power <i>Sport-specific</i>
Impact and sport	Bike, no resistance <i>Once ROM >115°</i>	Incline treadmill <i>Light pool kicking</i>	Running program <i>Then agility</i>	Non-contact play <i>Full contact per criteria</i>

CRITERIA FOR FULL CONTACT RETURN TO PLAY

- Full active ROM.
- Quadriceps strength greater than 85 to 90% of normal.
- No instability or giving way.
- Greater than 90% function on return to sport testing.

PHASE	TYPICAL TIMING	FOCUS	CRITERIA TO ADVANCE
I Protection	0-6 weeks	- Protect the PCL and prevent posterior tibial sag. Partial weight bearing with crutches for 2 weeks, then progress toward weight bearing as tolerated as quadriceps control returns. - Prone passive ROM 0-90° for 2 weeks, then progress to full. - Reduce swelling, activate the quadriceps and address gait mechanics. - Patient education.	▶ Progressing off crutches with improving gait. ▶ Straight leg raise without a quadriceps lag. ▶ ROM of at least 0-90°. ▶ Swelling controlled.
II Strength to 70°	6-12 weeks	- Protect the PCL. - Full ROM, supine and prone. - Double leg strengthening limited to 0-70° and single leg static strength. - Muscular endurance: 3 sets of 20.	▶ Full ROM and a normal gait. ▶ Controlled step-up onto an 8-inch step and step-down from a 6-inch step. ▶ Symmetric squat to 60° without compensation.
III Strength beyond 70°	13-18 weeks	- Discontinue the brace. - Muscular strength: progress strengthening beyond 70°. - Isolated hamstring exercises may begin after week 12. - Start the running program when its criteria are met. - Prepare for sport-specific activity.	▶ Full active ROM. ▶ No pain or swelling with running and functional loading. ▶ Quadriceps strength at least 85% of the other leg. ▶ Good single leg control.
IV Power and return to sport	19+ weeks	- Muscular power: 3 sets of 4-8. - Sport-specific agility. - Non-contact return to play.	▶ Full contact return when all criteria for full contact return to play are met.

WHY THE PROTOCOL LOOKS LIKE THIS

- The quadriceps protect the PCL. Quadriceps contraction pulls the tibia forward and counteracts posterior sag, so quadriceps activation starts on day one.
- The hamstrings do the opposite. Isolated hamstring activation pulls the tibia posteriorly and loads the healing ligament, so it waits until after week 12.
- Early ROM is done prone. In the supine and seated positions, gravity and hamstring activation sag the tibia posteriorly.
- Double leg strengthening stays at 70° of knee flexion or less through week 12 to limit shear on the healing PCL.

WHEN TO CONTACT US

- Increasing posterior sag or a posterior drawer with hamstring activation.
- Recurrent effusion, posterior knee pain with flexion or episodes of giving way.
- ROM or strength that plateaus or regresses.
- Rotational or varus and valgus instability, which may indicate a missed combined injury.

WEEKS 0-6

 PRECAUTIONS

- Avoid hyperextension and prevent posterior tibial translation for 12 weeks.
- **No isolated hamstring exercises** until after week 12.
- **PRICE** (protect, rest, ice, compress, elevate).

 WEIGHT BEARING AND BRACE

- **Partial weight bearing** with crutches for 2 weeks, then progress toward weight bearing as tolerated as quadriceps control returns.
 - **Grade III:** slower progression to full weight bearing, with the brace locked in extension for walking for the first 2 to 4 weeks if Dr. Tummala specifies.
- **PCL brace (Jack or Rebound)** at all times, including rehabilitation and sleep, for a minimum of 12 weeks.

 RANGE OF MOTION

- **Prone passive ROM 0 to 90° for 2 weeks**, then progress to full ROM.

 EXERCISES

- **Patellar mobilizations.**
- **Quadriceps sets.** Straight leg raises once the quadriceps can lock the knee in terminal extension with no lag.
- **Gastrocnemius stretching.** Hip abduction and adduction.
- **Stationary bike** with zero resistance once ROM is greater than 115°.
- **Weight shifts and pool walking** to prepare for crutch weaning.
- **Calf raises and single leg balance** once weaned from crutches.
- **Upper body and core** strength as appropriate.

WEEKS 6-12

 PRECAUTIONS

- Continue to avoid hyperextension and posterior tibial translation.
- **Continue PRICE.**
- **Limit double leg strengthening** to 70° of knee flexion or less.

 WEIGHT BEARING AND BRACE

- **Weight bearing as tolerated.** Crutch weaning continues into weeks 6-12 if needed. Address gait mechanics during crutch weaning.
- **PCL brace** at all times.

 RANGE OF MOTION

- **Full ROM**, supine and prone.

 EXERCISES

- **Endurance focus:** 3 sets of 20 reps.
- **Continue Weeks 0-6 exercises.** Gastrocnemius and light hamstring stretching.
- **Leg press 0 to 70°.** Static lunge.
- **Squat progression:** squat, then squat with calf raise, then squat with weight shift.
- **Hamstring bridges on a ball and single leg deadlift**, both with the knee extended.
- **Progressive resistance stationary bike.** Light kicking in the pool.
- **Incline treadmill walking** (7 to 12% incline).
- **Proprioceptive and balance exercises.**

WEEKS 13-18

 BRACE

- **Discontinue the PCL brace.**

 EXERCISES

- **Strength focus:** progress strengthening beyond 70° of knee flexion.
- **Isolated hamstring exercises** may begin after week 12.
- **Double leg press** progressing to single leg.
- **Single leg knee bends, balance squats and single leg deadlift.**
- **Single leg bridges** starting during week 16.
- **Continue bike and treadmill walking.**

 RUNNING

- Start once strength and stability with functional exercise are sufficient and **quadriceps girth is at least 90%** of the other side.
 - Week 1: walk 4 min, jog 1 min, for 15 to 20 min.
 - Week 2: walk 3 min, jog 2 min, for 20 min.
 - Week 3: walk 2 min, jog 3 min, for 20 min.
 - Week 4: walk 1 min, jog 4 min, for 20 min.
- Then **single plane agility**, progressing to multi-planar agility.

WEEKS 19+

 EXERCISES

- Continue Weeks 13-18 exercises and protocol.
- Power focus: 3 sets of 4 to 8 reps.
- Sport-specific agility.

 RETURN TO PLAY

- Non-contact return to play.
- Full contact return to play when the criteria for full contact return to play are met.

WEEK-BY-WEEK PROGRESSION

EXERCISE	1	2	3	4 (1 mo)	5	6	7	8 (2 mo)	9	10	12 (3 mo)	14	16 (4 mo)	18	20	24 (6 mo)
Weight Bearing and Brace																
Partial weight bearing with crutches																
Progress to weight bearing as tolerated, wean crutches																
PCL brace at all times, including sleep																
Range of Motion																
Prone passive ROM 0-90°																
Progress to full ROM																
Full ROM, supine and prone																
Early Strengthening																
Quad sets, SLR, patellar mobilizations																
Gastroc stretching, hip abduction and adduction																
Calf raises, single leg balance (once weaned from crutches)																
Advanced Strengthening																
Leg press and squat progression 0-70°																
Static lunge																
Strengthening beyond 70°, single leg press																
Power and sport-specific agility																
Hamstrings																
Ball bridges (knee straight)																
Single leg deadlift (knee straight through week 12)																
Isolated hamstring exercises																
Single leg bridges																
Cardiovascular Exercises																
Stationary bike, zero resistance (ROM >115°)																
Pool walking																
Progressive resistance bike																
Light kicking in the pool																
Incline treadmill walking (7-12%)																
High-Level Activities																
Running program (once criteria are met)																
Single plane, then multi-plane agility																
Non-contact return to play																

Adapted from Pierce CM, O'Brien L, Griffin LW, LaPrade RF. Posterior cruciate ligament tears: functional and postoperative rehabilitation. *Knee Surg Sports Traumatol Arthrosc.* 2013;21(5):1071-1084. This protocol is a general guideline and does not replace the clinical judgment of the treating therapist and surgeon. Please contact our office with any questions.