

PCL Reconstruction

Physical Therapy Protocol · Criterion-Based, 6-12 Month Timeline

Modeled on the Ohio State University Wexner Medical Center PCL Reconstruction Clinical Practice Guideline (2023) and the Mass General Brigham PCL reconstruction rehabilitation protocol, with PCL/PLC considerations from Pierce et al.



AT A GLANCE

TIMELINE	6-12 months, criterion-based progression; expected return to sport 6-12 months
WEIGHT BEARING	WBAT with crutches, brace locked in extension x 6 weeks; unlock at 6 weeks, discharge brace at ~8 weeks (or transition to dynamic PCL brace per surgeon)
KEY MILESTONES	PROM 0-90° by week 2 (prone) · AROM 0-130° by week 10 · isokinetic ≥80% to run · ≥90% + hop LSI ≥90% for RTS
RETURN TO ACTIVITY	Jogging ~4-5 months once isokinetic quad/HS ≥80%; sport 6-12 months with LSI ≥90% and physician clearance

KEY PRECAUTIONS

- Protect the graft from posterior tibial translation: no hyperextension, support the proximal tibia during PROM, and perform early flexion PROM in prone with clinician support.
- No active hamstring flexion exercises x 8 weeks; no resisted OKC hamstring exercises x 16 weeks (hamstrings translate the tibia posteriorly).
- No knee flexion >90° for the first 4 weeks; do not over-stretch — the reconstructed PCL tends toward residual laxity.
- Combined PCL+PLC reconstruction: no extension past neutral x 12 weeks, apply a slight valgus force during PROM flexion x 12 weeks, and guard against hyperextension/varus thrust when normalizing gait.

PHASED REHABILITATION

PHASE 1 — PROTECTION		Weeks 0-6
GOALS	- Protect healing graft from elongation (no posterior tibial sag, no hyperextension) - PROM 0-90° by week 2; restore terminal extension to 0° (not beyond) - Strong quadriceps activation; control pain and effusion	
INTERVENTIONS	- WBAT with crutches, brace locked in extension x 6 weeks - Prone PROM knee flexion 0-90° with clinician supporting the proximal tibia; progress PROM to AAROM after week 2 - Extension ROM to 0° only: seated towel stretch, prone hang, bag hang - stop at 0°, do not push into hyperextension - Quad sets, prone TKE, 4-way SLR with brace (wean brace once 3x10 without extensor lag), gluteal isometrics, ankle pumps, patellar mobilization - NMES to quadriceps in long sitting for volitional activation deficits - Week 2: LAQ through protected 90-45° arc; shuttle/leg press 0-45° - Week 3: upright bike for ROM only (no resistance)	
CRITERIA TO ADVANCE	- Strong isometric quad contraction with full tetany and superior patellar glide - SLR without extensor lag - PROM 0-90° - Pain and edema reduced and well controlled	

PHASE 2 — LOADING		Weeks 6-12
GOALS	- Normalize ROM (0-130°) and gait without assistive device - Build quadriceps, gluteal, and core strength	
INTERVENTIONS	- Open brace at week 6; discharge brace at week 8 or transition to dynamic PCL brace (anterior tibial support) per surgeon preference - Mini squats 0-45° progressing flexion arc as control improves; step-ups, heel taps - Week 8: active heel slides and active prone knee flexion for ROM only (no resistance); Swiss ball bridges with knees extended - Stationary bike with minimal-moderate resistance from week 6; cycling (no toe clips) week 10; elliptical week 12 - Single-leg balance progression, multi-angle quad isometrics, trunk stability (TrA progression, planks) - Gait training: full weight bearing with normalized pattern; no hyperextension or varus thrust (critical with PLC involvement)	
CRITERIA TO ADVANCE	- AROM 0-130° (communicate with MD if not achieved) - Joint effusion ≤1+ - Normal gait pattern - Tolerates therapeutic exercise without pain or reactive effusion	

PHASE 3 — STRENGTH AND POWER		Months 3-5
GOALS	• Increase lower extremity strength and power • Normalize mechanics with functional movement; initiate walk-jog program once criteria met	
INTERVENTIONS	• Progressive resistance: squats, leg press, leg extensions, deadlifts, multi-directional lunges • No resisted OKC hamstring exercise until week 16; then introduce hamstring curls with light load • Single-leg squats and Romanian deadlifts on BOSU with manual perturbation • Partial body-weight jumping on shuttle, double-leg progressing to single-leg • Walk-jog progression once running criteria achieved	
CRITERIA TO ADVANCE	• Full, pain-free ROM symmetrical with uninvolved limb • Isokinetic quad and hamstring $\geq 80\%$ at $60^\circ/\text{sec}$ and $300^\circ/\text{sec}$ to begin running • Effusion $\leq 1+$ with normalized gait and jogging mechanics • Pain-free hopping in place	

PHASE 4 — RETURN TO SPORT		Months 6-12
GOALS	• Restore power, agility, and sport-specific movement quality • Meet objective return-to-sport criteria	
INTERVENTIONS	• Agility drills beginning at 50-75% effort (shuffle, carioca, figure-8) progressing to full speed • Plyometric progression: bilateral to single-leg, altered surfaces, ball toss, rotational demands; single-leg hop downs up to 12-inch box • Sport-specific training and graded practice re-entry • No functional hop testing before 6 months post-op	
CRITERIA TO ADVANCE	• Isokinetic quad and hamstring $\geq 90\%$ at $60^\circ/\text{sec}$ and $300^\circ/\text{sec}$ • Functional hop testing LSI $\geq 90\%$ on all tests • No reactive effusion ($\leq 1+$) with sport-specific activity • Appropriate force-attenuation mechanics with high-level agility and plyometrics • Physician clearance	

GUIDING PRINCIPLES

This protocol follows criterion-based progression over rigid time-based advancement; phased rehabilitation balancing tissue healing with controlled stress application; objective milestones (ROM, strength LSI, functional testing) to guide phase transitions; individualization based on surgical findings, tissue quality, and patient factors; and ongoing surgeon–therapist communication throughout recovery.

REFERENCES

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2. Massachusetts General Hospital Sports Physical Therapy. Rehabilitation Protocol for Posterior Cruciate Ligament Reconstruction. <https://www.massgeneral.org/assets/mgh/pdf/orthopaedics/sports-medicine/physical-therapy/rehabilitation-protocol-for-posterior-cruciate-ligament-pclr.pdf>
3. 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. doi:10.1007/s00167-012-1970-1.
4. Welch T, Keller T, Maldonado R, Metzger M, Mohr K, Kvitne R. The Effect of a Dynamic PCL Brace on Patellofemoral Compartment Pressures in PCL- and PCL/PLC-Deficient Knees. *J Exp Orthop.* 2017;4:10. doi:10.1186/s40634-017-0085-5.

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for the current version of this protocol.