Isolated PCL Reconstruction Rehabilitation Protocol

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This protocol provides general guidelines for rehabilitation following isolated PCL reconstruction. Progression should be individualized based on the procedure, healing, and patient response, with modifications as directed by the surgeon.

Phase	Goals	Precautions / Restrictions	Treatment

Weeks 0-6	• **Protect healing PCL**
	• Resolve swelling/pain
	• Reactivate quad with **no extensor lag**
	• **Normalize pain free gait on level ground**
		• Weight bearing:
		  • 0-3 wks: TWB, locked in extension
		  • 3-6 wks: PWB, brace unlocked when quad control established
		• Brace: 24/7, except for hygiene, dynamic PCL brace as swelling allows
		• ROM:
		  • 0-2 wks: **0-90°** PROM in prone
		  • 2-5 wks: PROM as tolerated in prone or supine
		• **Avoid posterior tibial translation for 6 wks**
		• **No isolated open kinetic chain hamstring exercises**
		• May provide manual tibial external rotation or anterior tibial glide to remove tension if pain while performing flexion exercises.
			General guidelines
			• PRICE principles
			• NMES of quad if needed
			• Ankle pumps, isometrics for quad, hip, calf
			• Prone PROM, supine after 2 wks
			• Long arc quads or isometrics: **90°**-**60°**; progress weight, **10 lb** limit
			• Prone resisted terminal knee extension through available range
			• Straight leg raise without extension lag
			• NWB hip abduction
			• Gastrocnemius stretch as needed
			Initial visit
			• FOTO, LEFS
			Week 3
			• Can begin unresisted bike at wk 3

Weeks 6-12	• **Protect healing PCL** • Full knee ROM **0-130°** • **Normalize gait** • Build strength • 7” step down without compensation • **70%** quad strength symmetry	• Weight bearing: as tolerated, wean crutches • Brace: 24/7, except for hygiene, until **no visual posterior drawer with hamstring exercises, typically 12 wks** • **Do not perform isolated hamstring contractions or exercises that cause posterior pain or an observable posterior drawer** • **No resisted hamstring exercises until 12 wks** • CKC exercises: limit depth to **90°** knee flexion	**General guidelines** • CKC per progression below • Long arc quads; **90°**-**60°**; **>10 lbs** **Week 6** • FOTO, LEFS **Week 8** • Begin hamstring activation exercises at 8 wks, start with isometrics, heel slides, and standing hamstring curls, see below • **Only if needed, begin light hamstring stretching at 8 wks** **Weeks 8–12** • Long arc quads: **90°**-**45°**, wks 8-12 **Week 10** • Can add resistance to bike at 10 wks

Phase	Goals	Precautions / Restrictions	Treatment
Weeks 12-18	• Full AROM • **Avoid swelling** • Build hamstring strength • Build muscular endurance, strength, power	• Wean from brace if **no visible/palpable posterior drawer with hamstring activation** • **Avoid posterior pain or posterior drawer with hamstring strengthening exercises** • **Avoid lower extremity and trunk compensations in all three planes** • At 16 wks, begin return to running if quad strength **> 80%** symmetry and H:Q is **50%**	**General guidelines** • Long arc quads: full ROM, weight as tol • Begin hamstring strengthening, see below • Begin elliptical • Add resistance to CKC exercises • Light impact/plyometric exercises in preparation for running at 16 wks • Return to run protocol; phase I/intervals **Week 12** • FOTO, LEFS
Weeks 18+	• Control all forces required for sport and work • **>90%** quad strength symmetry • **>90%** function on return to sport testing • **> 70%** H:Q	• Add agility and plyometric drills at 18 wks if able run 1 mile without deviations • Add hopping, cutting, pivoting, sports movements at 20 weeks if **> 85%** quad strength symmetry and H:Q **> 60%** • **Avoid compensations**	**General guidelines** • Progress speed, power, and plyometrics • Progress running distance and intensity • Progress acceleration, deceleration, change in direction • Progress to sport specific movements **Week 18-24** • FOTO, LEFS

PCL Exercise Progressions

CKC lower extremity strengthening — ordered from least to most force on the PCL

- For all the following exercises, force on PCL increases as move from quad dominant (knees in front of toes) to glute dominant (knees behind toes)
- Squats (50° limit, progressing to 70°, then 90°, gradually and per restrictions)
  - Force increase as move from forward trunk lean to upright trunk
- Lunges (0-50° through wk 12 as highest force is above 50°)
  - Sideways, progress to forward (quad, progressing to glute dominant)
  - Static progressing to stepping out and back
- Heavy leg press
- Heavy dumbbell/barbell squat (progress from front to back squat)

Hamstring strengthening

- Start 0-55°, progress ROM as tolerated
- Standing, progress no weight to weight
- Prone, progress no weight to weight
- Single leg RDL
- Bridge
  - Straight knee, progress to bent knee
  - Marching
  - Bridge walk outs (16 wks)
  - Single leg bridge (16 wks)

Definitions and precautions

*CKC = closed kinetic chain; H:Q = hamstring:quadriceps strength ratio; TWB = <10 lbs; PWB = <25% body weight; as tol = as tolerated We want to avoid forces that stress the PCL (posterior tibial translation – caused by positioning, hyperextension, or hamstring activation). The PCL lengthens as it moves towards 90° knee flexion and then decreases beyond 90°. The PCL brace places an anterior force on the tibia and MUST be worn at all times for the first 12 weeks. The included exercises and detailed progressions are not an exhaustive list, but are designed to be representative. The following progressions are proposed based on research and biomechanics related to force on the PCL.