

Non-Operative Isolated PCL Rehabilitation Protocol

Phase	Goals	Precautions/Restrictions	Treatment
Weeks 0-6	<ul style="list-style-type: none"> • Protect healing PCL • Resolve swelling/pain • Normalize pain free gait on level ground without crutches • Reactivate quadriceps with no extensor lag 	<ul style="list-style-type: none"> • PCL brace worn at all times • Avoid knee hyperextension and posterior tibial translation • No isolated hamstring exercises • ROM: <ul style="list-style-type: none"> ○ 0-2 wks: 0-90° PROM in prone ○ 2-6 wks: PROM as tolerated, prone or supine • Gait: <ul style="list-style-type: none"> ○ 0-2 wks: PWB with crutches ○ 2-6 wks: WBAT, wean from crutches as able 	<ul style="list-style-type: none"> • Compression, elevation, cryotherapy • NMES if needed • Ankle pumps, isometrics for quad, hip, calf • Straight leg raise without extension lag • NWB hip abduction, flexion, and external rotation strengthening • Prone PROM, may progress to supine after 2 wks • Gastrocnemius stretch as needed • Stationary bike as ROM allows, resistance matches weight bearing • Weight bearing as appropriate: <ul style="list-style-type: none"> ○ Weight shifts ○ Terminal knee extensions ○ Single leg balance ○ No squats/lunges until wk 6 • Initial Visit: FOTO, LEFS
Weeks 6-12	<ul style="list-style-type: none"> • Protect healing PCL • Full knee PROM 0-130° • Address gait abnormalities • Address CKC squat mechanics • Build quad strength 	<ul style="list-style-type: none"> • PCL brace worn at all times • Avoid knee hyperextension and posterior tibial translation • No isolated hamstring exercises, can begin lower extremity strengthening (co-contraction) • Avoid compensations • CKC exercise limited to 70° flexion, lunges limited to 50°, see below 	<ul style="list-style-type: none"> • Progress knee ROM, no active knee flexion • CKC strength progression, see below • Static lunge holds 0-45° • Seated knee extension, add weight to ankle as appropriate • Single leg Romanian deadlift, begin wk 8 • Week 6: FOTO, LEFS
Weeks 12-18	<ul style="list-style-type: none"> • Full AROM • Avoid swelling • Develop hamstring strength • Develop muscular endurance, strength, power 	<ul style="list-style-type: none"> • Wean from PCL brace at 12-16 wks post injury with surgeon approval • Avoid lower extremity and trunk compensations in all three planes • Begin return to running if quad strength > 80% symmetry • Progress strengthening to > 70° knee flexion for squats and 50° for lunges 	<ul style="list-style-type: none"> • Begin active knee flexion • Begin hamstring progression, see below • CKC strength progression, see below • Light impact/plyometric exercises in preparation for running • Return to run protocol; phase I/intervals • Week 12: FOTO, LEFS
Weeks 18+	<ul style="list-style-type: none"> • Control all forces required for sport and work • >90% quad strength symmetry • >90% function on return to sport testing 	<ul style="list-style-type: none"> • Avoid lower extremity and trunk compensations in all three planes • Athlete is demonstrating increasing confidence levels in healing knee 	<ul style="list-style-type: none"> • Progress speed and power activities • Progress running distance and intensity • Progress plyometrics • Progress acceleration/deceleration • Progress tolerance to changes in direction • Progress to sport specific movements • Week 18-24: FOTO, LEFS

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Force	CKC Lower Extremity Strengthening	Hamstring Strengthening
Least force on PCL	<ul style="list-style-type: none"> • **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) <ul style="list-style-type: none"> ○ Force increase as move from forward trunk lean to upright trunk 	<ul style="list-style-type: none"> • Start 0-55°, progress ROM as tolerated • Standing, progress no weight to weight • Prone, progress no weight to weight • Single leg RDL
↓	<ul style="list-style-type: none"> • Lunges (0-50° through wk 12 as highest force is above 50°) <ul style="list-style-type: none"> ○ Sideways, progress to forward (quad, progressing to glute dominant) ○ Static progressing to stepping out and back 	<ul style="list-style-type: none"> • Bridge <ul style="list-style-type: none"> ○ Straight knee, progress to bent knee ○ Marching ○ Bridge walk outs (16 wks) ○ Single leg bridge (16 wks)
Most force on PCL	<ul style="list-style-type: none"> • Heavy leg press • Heavy dumbbell/barbell squat (progress from front to back squat) 	

*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.**

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