

Anterior Cruciate Ligament Reconstruction Delayed Rehab Protocol

This rehabilitation protocol has been designed for patients who have undergone an ACL reconstruction with other surgical issues that may prolong or otherwise change the rehabilitation process. This protocol also may be slightly deviated depending upon the particular procedure. The ACL Rehabilitation protocol for all grafts is the same with the following exceptions:

If a hamstring autograft was used:

- a. when performing heel slides, make sure that a towel/sheet is used to avoid actively contracting the hamstrings.
- b. do not perform isolated hamstring exercises until the 4th week post-op.

The following may be considered criteria for this protocol:

- Concomitant meniscal repair
- Concomitant ligament reconstruction
- Concomitant patellofemoral realignment procedure
- ACL revision reconstruction

The protocol is divided into several phases according to postoperative weeks and each phase has anticipated goals for the individual patient to reach. The **overall goals** of the reconstruction and the rehabilitation are to:

- Control joint pain, swelling, hemarthrosis
- Regain normal knee range of motion
- Regain a 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 after the 2nd 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 clinic 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.

**Phase 1: Weeks 1-2
 ACL Delayed Protocol**

WEEK	EXERCISE	GOAL
1-2	ROM	0-90°
	ROM (passive)	
	--meniscus repair, MCL, ACL revision	0-90°
	--patellar realignment	0-75°
	Patellar mobilizations	
	Ankle pumps	
	Gastroc/soleus stretches	
	Heel slides	
	Wall slides	
	STRENGTH	
	Quad sets x 10 minutes	
	SLR (flex and abd)	
	Heel raise/Toe raise	
	Wall squats	
	WEIGHT BEARING	
	--meniscus repair – NWB	
	--MCL – wt bearing as tolerated	
	--ACL revision – wt bearing as tolerated	
	MODALITIES	
	Electrical stimulation as needed	
	Ice 15-20 minutes with knee at 0° ext	
	BRACE	
	Remove brace to perform ROM activities	
	Post-op brace when walking with crutches	

GOALS OF PHASE:

- ROM (see above, depends on procedure)
- Control pain, inflammation, and effusion
- Adequate quad contraction
- NWB to TDWB per Dr. (depends on procedure)

**Phase 2: Weeks 2-4
 ACL Delayed Protocol**

WEEK	EXERCISE	GOAL
2-4	ROM Passive, 0-90° Patellar mobilizations Ankle pumps Gastoc/soleus stretch Light hamstring stretch at wk 4 Heel/Wall slides to reach goal STRENGTH Multi-angle isometrics (90-60°) Quad sets with biofeedback SLR (flex, abd, add) Wall Squats Heel raise/Toe raise BALANCE TRAINING Weight shifts (side/side, fwd/bkwd) Single leg balance (dependent upon procedure) MODALITIES E-stim/biofeedback as needed Ice 15-20 minutes BRACE Post-op brace when walking with crutches	0-90°

GOALS OF PHASE:

- ROM to 90° flexion and 0° extension
- Diminish pain, inflammation, and effusion
- Quad control
- Initiate weight bearing as permitted

**Phase 3: Weeks 4-6
 ACL Delayed Protocol**

WEEK	EXERCISE	GOAL
4-6	ROM Passive, 0-125° Gastoc/soleus/hs stretch Heel/wall slides to reach goal STRENGTH Progressive isometric program SLR in 4 planes with ankle weight/tubing Heel raise/Toe raise Mini-squats/Wall squats Initiate isolated hamstring curls Multi-hip machine in 4 planes Leg Press-double leg eccentric Initiate bike when 110° flexion EFX/Retro treadmill Lateral/Forward step-ups/downs Lunges BALANCE TRAINING Single leg stance Weight shift Balance board/two-legged Cup walking/hesitation walking WEIGHT BEARING PWB to FWB as allowed by quad control Discontinue crutches when FWB is allowed MODALITIES Ice 15-20 minutes BRACE Discontinue post-op brace Measure for functional brace	0-125°

GOALS OF PHASE:

- ROM 0-125°
- Increase lower extremity strength and endurance
- Minimize pain, swelling, and effusion
- Increase weight-bearing status from PWB to FWB

**Phase 4: Weeks 6-12
 ACL Delayed Protocol**

WEEK	EXERCISE	GOAL
6-10	ROM Passive, 0-135° Gastoc/soleus/hs stretch STRENGTH Continue exercises from wk 4-6 Leg Press-single leg eccentric Lateral lunges BALANCE TRAINING Two-legged balance board Single leg stance with plyotoss Cup walking ½ Foam roller work MODALITIES Ice 15-20 minutes BRACE Functional brace as needed	0-135°
10-12	ROM Passive, 0-135° Gastoc/soleus/hs stretch STRENGTH Continue exercises from wk 4-10 Initiate jogging protocol-start on minitramp as tolerated, progress to treadmill Progress with proprioception training Walking program Bicycle for endurance MODALITIES Ice 15-20 minutes	0-135°

GOALS OF PHASE:

- Full weight bearing, normal gait
- Restore full knee ROM (0-135°)
- Increase strength and endurance
- Enhance proprioception, balance, and neuromuscular control

Phase 5: Weeks 12-16
ACL Delayed Protocol

WEEK	EXERCISE
12-16	ROM Continue all stretching activities
	STRENGTH Continue exercises from wk 4-12 Initiate plyometric training drills Progress jogging/running program Initiate isokinetic training (90-30°), (120-240°/sec)
	MODALITIES Ice 15-20 minutes

GOALS OF PHASE:

- Restore functional capability and confidence
- Restore full knee ROM (0-135°)
- Enhance lower extremity strength and endurance

Phase 6: Weeks 16-20
ACL Delayed Protocol

WEEK	EXERCISE
16-20	ROM Continue all stretching activities
	STRENGTH Continue all exercises from previous phases Progress plyometric program Increase jogging/running program Swimming (kicking) Backward running
	FUNCTIONAL PROGRAM Sport specific drills
	CUTTING PROGRAM Lateral movement Carioca, figure 8's
	MODALITIES Ice 15-20 minutes as needed

GOALS OF PHASE:

- Maintain muscular strength and endurance
- Perform selected sport-specific activity
- Progress skill training
- Enhance neuromuscular control

**Phase 7: Week 20-36
ACL Delayed Protocol**

WEEK	EXERCISE
20-36	STRENGTH Continue advanced strengthening FUNCTIONAL PROGRAM Progress running/swimming program Progress plyometric program Progress sport training program Progress neuromuscular program MODALITIES Ice 15-20 minutes as needed

GOALS OF PHASE:

- Return to unrestricted sporting activity
- Achieve maximal strength and endurance
- Progress independent skill training
- Normalize neuromuscular control drills

At six and twelve months, a follow-up isokinetic test is suggested to guarantee maintenance of strength and endurance. Advanced weight training and sport specific drills are advised to maintain a higher level of competition.