

Anterior Cruciate Ligament (ACL) Reconstruction- Delayed Rehabilitation Protocol

This rehabilitation protocol has been designed for patients who have undergone an ACL reconstruction (HS graft/PTG/Allograft) in addition to other surgical issues that may delay the initial time frame of the rehab process. Dependent upon the particular procedure, this protocol also may be slightly deviated secondary to Dr. Stewart's medical decision. The ACL protocol for Hamstring Tendon Grafts and Allografts is the same as for the Bone Patellar Tendon Bone Grafts with the following exceptions:

1. When performing heel slides, make sure that a towel/sheet is used to avoid actively contracting the hamstrings.
2. 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 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 ONE: Weeks 1-2 Delayed Protocol

WEEK	EXERCISE	Goal
1-2	ROM ROM (passive) --Meniscus repair, MCL, ACL revision 0-90° --Patellar realignment 0-75° Patellar mobs 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- 30% PWB --MCL—weight bearing as tolerated, per Dr. Fullick --ACL revision—weight bearing as tolerated MODALITIES Electrical stimulation as needed Ice 15-20 minutes with knee at 0° ext BRACE Remove brace to perform ROM activities I-ROM when walking with crutches	0-90°

GOALS OF PHASE ONE:

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

PHASE TWO: Weeks 2-4 Delayed Protocol

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

GOALS OF PHASE TWO:

- ROM to 90° flexion and 0° extension
- Diminish pain, inflammation, and effusion
- Quad control
- Increase to 50% PWB as permitted by Dr. Fullick

PHASE THREE: Weeks 4-6 Delayed Protocol

WEEK	EXERCISE	Goal
4-6	<p>ROM</p> <p>Passive ROM 0-125° Gastoc/soleus/hs stretch Heel/wall slides to reach goal</p> <p>STRENGTH</p> <p>Progressive isometric program SLR in 4 planes with ankle weight/tubing Heel raise/Toe raise Mini-squats/Wall squats</p>	0-125°

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

Discharge crutches
 when FWB is allowed

MODALITIES

Ice 15-20 minutes

BRACE

Measure for functional brace

Discharge I-ROM with
 issuance of functional
 brace

GOALS OF PHASE THREE:

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

PHASE FOUR: Weeks 6-12 Delayed Protocol

WEEK	EXERCISE	Goal
6-12	<p>ROM</p> <p>Passive, 0-135° Gastoc/soleus/hs stretch</p> <p>STRENGTH</p> <p>Continue exercises from weeks 4-6 Leg press—single leg eccentric Lateral lunges</p> <p>BALANCE TRAINING</p> <p>Two-legged balance board Single leg stance with Plyotoss Cup walking 1/2 foam roller work</p> <p>MODALITIES</p> <p>Ice 15-20 minutes</p> <p>BRACE</p> <p>Functional brace as needed</p>	0-135°

10-12	<p>ROM</p> <p>Passive, 0-135° Gastoc/soleus/hs stretch</p> <p>STRENGTH</p> <p>Continue exercises from weeks 4-10 Initiate jogging protocol - start on mini-tramp as tolerated, progress to treadmill Progress with proprioception training Walking program Bicycle for endurance</p> <p>MODALITIES</p> <p>Ice 15-20 minutes</p>	0-135°
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GOALS OF PHASE FOUR:

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

PHASE FIVE: Weeks 12-16 Delayed Protocol

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

GOALS OF PHASE FIVE:

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

PHASE SIX: Weeks 16-20 Delayed Protocol

WEEK	EXERCISE	Goal
16-20	<p>ROM</p> <p>Continue all stretching activities</p> <p>STRENGTH</p> <p>Continue all exercises from previous phases Progress plyometric program Swimming (kicking)</p>	

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 SIX:

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

PHASE SEVEN: Weeks 20-36 Delayed Protocol

WEEK	EXERCISE	Goal
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 SEVEN:

- 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.