

ACL Reconstruction Rehabilitation Delayed 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 rehabilitation process. Dependent upon the particular procedure, this protocol also may be slightly deviated secondary to Dr. Grimshaw'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 procedures may be considered criteria for this protocol:

- Meniscal repair
- Associated MCL or PCL reconstruction
- ACL reconstruction revision
- Articular cartilage damage or Microfracture

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:

- Establish good quadriceps activity
- Control joint pain, swelling, hemarthrosis
- Restore normal knee range of motion
- Restore a normal gait pattern and neuromuscular stability for ambulation
- Restore normal lower extremity strength
- Restore normal proprioception, balance, and coordination for daily activities
- Achieve the highest level of function based on the orthopedic and patient goals

Physical therapy is to begin day 1 post-op. It is extremely important for the supervised rehabilitation to be supplemented by a home exercise 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, hypersensitivity
- Abnormal gait pattern, with or without assistive device
- Limited range of motion
- Weakness in the lower extremity musculature (quadriceps, hamstring)
- Extreme pain, tenderness and/or swelling in the calf

Return to activity requires both time and clinical 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 evaluations are both methods of determining a patient's readiness to return to activity.

Phase 1: Week 1-2

WEEK	EXERCISE	GOAL
1-2	ROM Men rep, MCL, ACL rev 0-90 Patella realignment 0-75 Patellar mobs CPM (as directed by MD) Hamstring stretch (avoid with HS graft) Gastoc-soleus stretch Heel slides with towel/Wall slides STRENGTH Quad sets with Biofeedback 10 min (10" holds, 30 reps, 10x daily) Calf Raises, Toe raises Wall squats Notes: SLR: Perform quad set and lift 12 in off table, do not progress to functional activity until patient can perform 5' with 5 lbs w/out lag. WEIGHT BEARING TTWB to WBAT according to Dr. Grimshaw TTWB meniscus repair/cartilage restoration WBAT with crutches until quad control is gained One crutch before FWB with no crutches Eliminate quad avoidance pattern MODALITIES Electrical stimulation as needed (NMES, TENS) Ultrasound/Soft tissue mobs to portals (once incisions are closed) Ice 15-20 minutes with knee at 0° ext BRACE Will be progressively unlocked per MD orders Remove brace to perform ROM activities at home	0-90°

GOALS OF PHASE:

- ROM 0-90°
- Restore voluntary muscle activation
- Control pain, inflammation, and effusion
- TTWB to FWB as tolerated as determined by Dr. Grimshaw
- Restore full patellar mobility

Phase 2: Week 2-4

WEEK	EXERCISE	GOAL
2-4	ROM Continue previous Foam roller for ITB/Quad Light hamstring stretch at wk 4 STRENGTH Continue previous Multi-angle isometrics (90-60) SLR (flex, abd, add) WEIGHT BEARING TTWB-WBAT As per instructions BALANCE TRAINING depending on WB status Weight shifts (side/side, fwd/bkwd) Single leg balance on various surfaces, ie. air disc, foam pad Double leg balance on tilt board, wobble board MODALITIES Continue as needed BRACE Post-op brace for ambulation	0-90°

GOALS OF PHASE:

- ROM 0-90°
- Eliminate pain, inflammation, and effusion
- Improve muscular strength and endurance
- Restore quad control

Phase 3: Week 4-6

WEEK	EXERCISE	GOAL
4-6	ROM	0-125°
	Continue previous	
	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	
	WEIGHT BEARING	
	PWB to FWB as determined by quad control	D/C crutches when FWB
	BALANCE TRAINING	
	Single leg stance	
	Weight shift	
	Balance board/two-legged	
	Cup walking/hesitation walking	
	MODALITIES	
	Ice 15-20 minutes as needed	
	BRACE	
	D/C post op brace	
	Measure for functional brace	

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: Week 6-12

WEEK	EXERCISE	GOAL
6-12	ROM Continue all stretching from previous phases Add prone quad stretch May add dynamic stretching at 8 weeks STRENGTH Continue all strengthening activities from previous phases increasing weight and repetitions Single leg leg press - eccentric Lateral lunges BALANCE TRAINING Two-legged balance board Single leg stance with plyotoss Cup walking ½ Foam roller work AEROBIC CONDITIONING PROGRAM Initiate jogging protocol at 10-12 weeks -start on minitramp as tolerated progress to treadmill Walking program Bicycle for endurance MODALITIES Ice 15-20 minutes as needed BRACE Functional Brace as needed	0-140

GOALS OF PHASE:

- Full weight bearing, normal gait
- Restore full knee ROM (0-140°)
- Increase strength and endurance
- Enhance proprioception, balance, and neuromuscular control

Phase 5: Week 12-16

WEEK	EXERCISE
12-16	ROM Continue all stretching from previous phases STRENGTH Initiate plyometric training drills Progress jogging/running program Initiate isokinetic training (90-30°), (120-240°/sec) MODALITIES Ice 15-20 minutes as needed BRACE Functional Brace as needed

GOALS OF PHASE:

- Restore functional capability and confidence
- Restore full knee ROM (0-140°)
- Enhance lower extremity strength and endurance

Phase 6: Week 16-36

WEEK	EXERCISE
16-36	ROM Continue all stretching from previous phases STRENGTH Progress plyometric drills BALANCE TRAINING Continue all single-leg activities increasing difficulty FUNCTIONAL TRAINING Sport-specific drills Cutting/agility program Agility Ladder: 1, 2, 3, 4, 5, 6, 7, 8, 9 Cone Drills: 1, 2, 3, 4, 5, 6 Lateral movement Carioca, figure 8 drills Initiate Sports Metrics – (5 mo BTB, 7-8 mo Achilles, HS) Progress running/swimming program Progress plyometric program Progress sport training program Progress neuromuscular program MODALITIES Ice 15-20 minutes as needed BRACE Functional Brace 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 month follow-up visit, a battery of functional tests may be performed to determine level of function. These will include single leg hop for distance, 40 yard figure 8 obstacle run, and isokinetic test at 60, 180, and 300°/sec.