

**Anterior Cruciate Ligament Reconstruction
Hamstring Graft/PTG-Accelerated Rehab
Dr. Robert Klitzman**

This rehabilitation protocol has been designed for patients with ACL reconstruction who anticipate returning to a high level of activity early postoperatively. The ACL Rehabilitation protocol for all 3 grafts is the same 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 are **exclusionary criteria** for this protocol:

- Concomitant meniscal repair
- Concomitant ligament reconstruction
- Concomitant patellofemoral realignment procedure
- ACL revision reconstruction
- MRI evidence of severe bone bruising or articular cartilage damage noted.

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 evaluations are both methods of evaluating a patient's readiness to return to activity.

Phase 1: Week 1-2
HS/PTG Accelerated Protocol
Dr. Robert Klitzman

WEEK	EXERCISE	GOAL
1-2	<p>ROM</p> <p>Passive, 0-110° Patella mobs Ankle pumps Gastroc-soleus stretches Wall slides Heel slides with towel</p> <p>STRENGTH</p> <p>Quad sets x 10 minutes SLR (flex, abd, add) Multi-hip machine (flex, abd, add) Leg Press (90-20°) - bilateral Mini squats (0-45°) Multi-angle isometrics (90-60°) Calf raises</p> <p>BALANCE TRAINING</p> <p>Weight shifts (side/side, fwd/bkwd) Single leg balance Plyotoss</p> <p>WEIGHT BEARING</p> <p>Wt bearing as tolerated with crutches Crutches until quad control is gained One crutch before FWB with no crutches</p> <p>BICYCLE</p> <p>May begin with 110° flex is reached DO NOT use bike to increase flexion</p> <p>MODALITIES</p> <p>Electrical stimulation as needed Ice 15-20 minutes with knee at 0° ext</p> <p>BRACE</p> <p>Remove brace to perform ROM activities I-ROM when walking with crutches</p>	0-110°

GOALS OF PHASE:

- ROM 0-110°
- Adequate quad contraction
- Control pain, inflammation and effusion

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Phase 3: Week 4-12
HS/PTG Accelerated Protocol
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WEEK	EXERCISE	GOAL
4-8	<p>ROM</p> <p>Self-ROM to gain FROM And maintain 0° extension Gastroc-soleus stretching Hamstring stretching</p> <p>STRENGTH</p> <p>Progress isometric program SLR with ankle weight/tubing Leg Press-single leg eccentric Initiate isolated hamstring curls Multi-hip in 4 planes Lateral/Forward step-ups/downs Lateral Lunges Wall Squats Vertical Squats Heel raise/Toe raise Bicycle/EFX Retro Treadmill Mini-squats/Wall squats Straight-leg dead lifts Stool crawl</p> <p>BALANCE TRAINING</p> <p>Steam boats in 4 planes Single leg stance with plyotoss Wobble board balance work-single leg ½ Foam roller work</p> <p>MODALITIES</p> <p>Ice 15-20 minutes following activity</p> <p>BRACE</p> <p>Functional brace as needed</p>	Full ROM 0-135°
8-10	<p>ROM</p> <p>Self-ROM as needed Gastroc/Soleus/HS stretch</p> <p>STRENGTH</p> <p>Continue exercises from wk 4-6 Progress into jogging program as ROM normalizes, pain and swelling are minimal. Begin on mini-tramp, progress to treadmill as tolerated.</p>	Full ROM 0-135°

Phase 3 cont.
ACL-HS/PTG Protocol
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WEEK	EXERCISE
8-10 cont	Isokinetic work (90-40°)(120-240°/sec) Walking program Bicycle for endurance Plyometric leg press/shuttle work
10-12	ROM Gastroc/Soleus/HS stretch STRENGTH Continue exercises from wk 4-10 Isokinetic test at 180° and 300°/sec Plyometric training drills Continue with stretching MODALITIES Ice 15-20 minutes as needed

GOALS OF PHASE:

- Restore full knee ROM (0-135°)
- Increase lower extremity strength and endurance
- Restore functional capability and confidence
- Enhance proprioception, balance, and neuromuscular control

Phase 4: Week 12-16
HS/PTG Acceleration Protocol
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WEEK

EXERCISE

12-16

ROM

Continue all stretching activities

STRENGTH

Continue all exercises from previous phases

Progress plyometric drills

Increase jobbing/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
- Enhance neuromuscular control
- Progress skill training
- Perform selected sport-specific activity

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Phase 5: Week 16-36
ACL HS/PTG Protocol
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WEEK

EXERCISE

16-36

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 sports specific drills are advised to maintain a higher level of competition.