

ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION Delayed Rehab

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:

- When performing heel slides, make sure that a towel/sheet is used to avoid actively contracting the hamstrings.
- 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

EXERCISE GOAL

RANGE OF MOTION

0-90°

ROM (passive)

Meniscus repair, MCL, ACL revision: 0-90°

Patellar realignment: 0-75°

Ankle pumps

ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION Delayed Rehab

PHASE ONE: Weeks 1-2 (cont'd)

EXERCISE GOAL

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—weight bearing as tolerated on a case by case basis, per Dr. Stewart

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

GOALS OF PHASE ONE:

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

PHASE TWO: Weeks 2-4

EXERCISE GOAL

RANGE OF MOTION:

0-90°

Passive, 0-90°

Patellar mobs

Ankle pumps

Gastroc/soleus stretch

Light hamstring stretch at Week 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)



Bruce A. Stewart, MD, MBA
Orthopaedic Surgeon/Sports Medicine Specialist
370 N. 120th Avenue
Holland MI 49424
P 616.396.5855

ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION

Delayed Rehab

PHASE TWO: Weeks 2-4 (cont'd)

MODALITIES

E-stim/biofeedback as needed

Ice 15-20 minutes

BRACE

I-ROM when walking with crutches

GOALS OF PHASE TWO:

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

PHASE THREE: Weeks 4-6

RANGE OF MOTION:

0-125°

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

Discharge crutches when FWB is allowed

MODALITIES

Ice 15-20 minutes

BRACE Discharge

Measure for functional brace 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

ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION Delayed Rehab

PHASE FOUR - Weeks 6-12

Weeks 6-10

RANGE OF MOTION:

0-135°

Passive, 0-135°

Gastoc/soleus/hs stretch

STRENGTH

Continue exercises from weeks 4-6

Leg press—single leg eccentric

Lateral lunges

BALANCE TRAINING

Two-legged balance board

Single leg stance with Plyotoss

Cup walking

1/2 foam roller work

MODALITIES

Ice 15-20 minutes

BRACE

Functional brace as needed

Weeks 10-12

RANGE OF MOTION:

0-135°

Passive, 0-135°

Gastoc/soleus/hs stretch

STRENGTH

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

MODALITIES

Ice 15-20 minutes

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

RANGE OF MOTION

Continue all stretching activities

STRENGTH

Continue exercises from weeks 4-12

Initiate plyometric training drills

Progress jogging/running program

Initiate Isokinetic training (90-30°) (120-240°/sec)

ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION Delayed Rehab

PHASE FIVE - Weeks 12-16 (cont'd)

MODALITIES

Ice 15-20 minutes

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

EXERCISE GOAL

RANGE OF MOTION

Continue all stretching activities

STRENGTH

Continue all exercises from previous phases

Progress plyometric 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 SIX:

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

PHASE SEVEN—Weeks 20-36

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.