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# Anterior Cruciate Ligament Reconstruction

## Accelerated Rehabilitation Protocol

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 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 are **exclusionary criteria** for this protocol:

Concomitant meniscal repair

Concomitant reconstruction of another ligament

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

## Phase 1: Week 1-2

### ACL Accelerated Protocol

#### WEEK EXERCISE GOAL

1-2 ROM 0-110°

Passive, 0-110°

Patella mobilizations

Ankle pumps

Gastoc-soleus stretches

Wall slides

Heel slides with towel

#### STRENGTH

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

#### BALANCE TRAINING

Weight shifts (side/side, fwd/bkwd)

Single leg balance

Plyotoss

#### WEIGHT BEARING

Wt bearing as tolerated with crutches

Crutches until quad control is gained

One crutch before FWB with no crutches

#### BICYCLE

May begin when 110° flex is reached

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DO NOT use bike to increase flexion

#### 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:

- ROM 0-110°
- Adequate quad contraction
- Control pain, inflammation, and effusion
- PWB TO FWB as capable

#### Phase 2: Week 2-4

#### WEEK EXERCISE GOAL

2-4 ROM 0-125°

Passive, 0-125°

Patella mobilizations

Ankle pumps

Gastoc-soleus stretch

Light hamstring stretch at wk 4

Wall, heel slides to reach goal

#### STRENGTH

Quad sets with biofeedback

SLR in 4 planes (add ext at wk 4)

Heel raise/Toe raise

Leg Press

Mini squat (0-45°)

Front and Side Lunges

Multi-hip machine in 4 directions

Bicycle/recumbent bicycle

Wall squats

#### BALANCE TRAINING

Balance board/2 legged

Cup walking/hesitation walk

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Single leg balance

Plyotoss

WEIGHT BEARING

As tolerated with quad control

Discontinue crutches 10 days post-op

MODALITIES

E-stim/biofeedback as needed

Ice 15-20 minutes

BRACE

Discontinue post-op brace week 4

Will measure for functional brace

### **GOALS OF PHASE:**

- Maintain full passive knee extension
- Gradually increase knee flexion to 125°
- Diminish pain, inflammation, and effusion
- Muscular strengthening and endurance
- Restore proprioception
- Patellar mobility

### **Phase 3: Week 4-12**

#### **WEEK EXERCISE GOAL**

4-8 ROM Full ROM

Self-ROM to gain Full ROM 0-135°

And maintain 0° extension

Gastoc/soleus stretching

Hamstring stretching

STRENGTH

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

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Heel raise/Toe raise

Bicycle/recumbent bicycle

Retro Treadmill

Mini-squats/Wall squats

Straight-leg dead lifts

Stool crawl

BALANCE TRAINING

Steam boats in 4 planes

Single leg stance with plyotoss

Wobble board balance work-single leg

½ Foam roller work

MODALITIES

Ice 15-20 minutes following activity

BRACE

Functional brace as needed

8-10 ROM Full ROM

Self-ROM as needed 0-135°

Gastroc/Soleus/HS stretch

STRENGTH

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 then hard surface when tolerated.

Progress with proprioception training

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

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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**

**WEEK EXERCISE**

12-16 ROM

Continue all stretching activities

STRENGTH

Continue all exercises from  
previous phases

Progress plyometric drills

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

**Phase 5: Week 16-36**

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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.