ORTHOSURGERY
Ιατρείο Ορθοπαιδικών Παθήσεων

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Anterior Cruciate Ligament Reconstruction
Delayed Rehab Protocol

This rehabilitation protocol has been designed for patients who have undergone an ACL reconstruction with 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 MD medical decision. 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 4^{th} 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 2^{nd} 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
- 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.
Abnormal gait pattern, with or without assistive device
Limited range of motion

Phase 1: Weeks 1-2
ACL Delayed Protocol

WEEK EXERCISE GOAL
1-2 ROM 0-90°

ROM (passive)
--meniscus repair, MCL, ACL revision 0-90°
--patellar realignment 0-75°
Patellar mobilizations
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 – NWB
--MCL – wt bearing as tolerated
--ACL revision – wt bearing as tolerated
MODALITIES
Electrical stimulation as needed
Ice 15-20 minutes with knee at 0° ext
BRACE
Remove brace to perform ROM activities
Post-op brace when walking with crutches

GOALS OF PHASE:

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

Phase 2: Weeks 2-4

ACL Delayed Protocol

WEEK EXERCISE GOAL

2-4 ROM 0-90°

Passive, 0-90°
Patellar mobilizations
Ankle pumps
Gastoc/soleus stretch
Light hamstring stretch at wk 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)
MODALITIES
E-stim/biofeedback as needed
Ice 15-20 minutes
BRACE
Post-op brace when walking with crutches

GOALS OF PHASE:

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

Phase 3: Weeks 4-6

ACL Delayed Protocol

WEEK EXERCISE GOAL

4-6 ROM 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

Discontinue crutches when FWB is allowed

MODALITIES

Ice 15-20 minutes

BRACE

Discontinue 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: Weeks 6-12

ACL Delayed Protocol

WEEK EXERCISE GOAL

6-10 ROM 0-135°

Passive, 0-135°
Gastoc/soleus/hs stretch
STRENGTH
Continue exercises from wk 4-6
Leg Press-single leg eccentric
Lateral lunges
BALANCE TRAINING
Two-legged balance board
Single leg stance with plyotoss
Cup walking
½ Foam roller work
MODALITIES
Ice 15-20 minutes
BRACE
Functional brace as needed

10-12 ROM 0-135°

Passive, 0-135°
Gastoc/soleus/hs stretch
STRENGTH
Continue exercises from wk 4-10
Initiate jogging protocol-start on minitramp
as tolerated, progress to treadmill
Progress with proprioception training
Walking program
Bicycle for endurance
MODALITIES
Ice 15-20 minutes

GOALS OF PHASE:

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

Phase 5: Weeks 12-16

ACL Delayed Protocol

WEEK EXERCISE

12-16 ROM

Continue all stretching activities

STRENGTH

Continue exercises from wk 4-12

Initiate plyometric training drills

Progress jogging/running program

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

MODALITIES

Ice 15-20 minutes

GOALS OF PHASE:

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

Phase 6: Weeks 16-20

ACL Delayed Protocol

WEEK EXERCISE

16-20 ROM

Continue all stretching activities

STRENGTH

Continue all exercises from previous phases

Progress plyometric program

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

Phase 7: Week 20-36

ACL Delayed Protocol

WEEK EXERCISE

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:

- 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.