Anterior Cruciate Ligament Reconstruction
Accelerated Rehabilitation Protocol
Dr. Mark Adickes

Introduction:
• This rehabilitation protocol is designed for patients with ACL injuries who anticipate returning early to a high level of activity following ligament reconstruction.

Goals of rehabilitation are to:
• Control joint pain, swelling, hemarthrosis
• Regain normal knee range of motion
• Regain a normal gait pattern
• Regain normal lower extremity strength
• Regain normal proprioception, balance, and coordination

The physical therapy is to begin post-op day #1. It is extremely important for the supervised rehabilitation to be supplemented by a home fitness program.

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

Return to activity:
• It requires both time and regular clinic evaluation to safely and efficiently return to functional activity.
• Adequate strength, flexibility, and endurance are all necessary to return to high level function, all of which are addressed in this program.
• Isokinetic testing and functional evaluation are required to assess a patient’s readiness to return to sport.
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**Phase 1: Week 1-2**

**Range of Motion:**
- Passive ROM, No limits
- Aggressive Patella mobility
- Ankle pumps
- Gastroc-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, then discontinued

**Bicycle:**
- May begin when 110 ° flex is reached

**Modalities:**
- E-stim/biofeedback as needed
- Ice 15-20 minutes with knee at 0 ° ext

**Brace:**
- Wear post-op brace at all times with the following exceptions:
  - Remove brace to perform ROM activities
  - Brace not required in bed
- Will measure for functional brace post-op day #1

**Hygiene:**
- OK to shower post-op day #1
- No pools, ponds or hot tubs until 2 weeks post-op (do not submerge incision)

**Goals for Phase 1:**
• ROM 0-110°
• Adequate quad contraction
• Control pain, inflammation, and effusion

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Phase 2: Week 2-4

Range of Motion:
• Passive ROM, unlimited
• Aggressive Patella mobility
• Ankle pumps
• Gastroc-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/EFX
• Wall squats

Balance Training:
• Balance board/2 legged
• Cup walking/hesitation walk
• Single leg balance
• Plyotoss

Weight Bearing:
• As tolerated with quad control

Modalities:
• E-stim/biofeedback as needed
• Ice 15-20 minutes

Brace:
• We will switch to a functional brace at the start of Phase 2
• Wear functional brace at all times with the following exceptions:
  ○ Remove brace to perform ROM activities
  ○ Brace not required in bed

Goals for Phase 2:
• Maintain full passive knee extension
• Increase knee flexion to 125°
• Diminish pain, inflammation, and effusion
• Increase muscle strength and endurance
• Restore proprioception
• Maintain Patellar mobility

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Phase 3: Week 4-12

Range of Motion:
• Passive ROM, unlimited
• Gastroc/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
• Heel raise/Toe raise
• Bicycle/EFX
• Retro Treadmill
• Mini-squats/Wall squats
• Straight-leg dead lifts
• Stool crawl
• Isokinetic work (90-40 °)(120-240 °/sec)

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

Goals for Phase 3:
• Full ROM
• Increase muscle strength and endurance.
• Progress slowly into jogging program at week #8 as ROM normalizes, pain and swelling are minimal. Begin on mini-tramp, progress to treadmill as tolerated then move to a hard surface when tolerated.
• Enhance proprioception, balance, and neuromuscular control.
• Restore functional capability and confidence
• At week 12: Isokinetic test at 180 and 300 degrees/sec

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Phase 4: Week 12-16

Range of Motion:
• Passive ROM, unlimited
• 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; decreasing the size of the course as tolerated

Modalities:
• Ice 15-20 minutes as needed

Goals for Phase 4:
• Maintain muscular strength and endurance
• Enhance neuromuscular control
• Progress skill training
• Perform selected sport-specific activity
Phase 5: Weeks 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 for Phase 5:
  • Return to unrestricted sporting activity as determined by Isokinetic and functional evaluation
  • 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.