



**ACL RECONSTRUCTION REHABILITATION PROTOCOL
DELAYED
DAVID R. MACK, M.D.**

INTRODUCTION

This DELAYED protocol is used if any of the following are present: meniscal repair, concomitant ligament repair or patellofemoral procedures, cartilage transfer or transplant, revision procedures, or marked physiologic laxity.

This delayed protocol differs from the accelerated protocol most obviously in the first 6 weeks, and follows six stages:

- Phase 1: Immediate (weeks 1-2)
- Phase 2: Early (weeks 2-4)
- Phase 3: Late-Early (weeks 4-6)
- Phase 4: Intermediate (weeks 6-12)
- Phase 5: Late (weeks 12-16)
- Phase 6: Return-to-sports (weeks 16-36)

The protocol is the same regardless of graft choice, bone-tendon-bone (BTB), hamstrings (HS), or allograft, with the following exceptions:

- Hamstrings: Do not perform any exercises requiring isolated hamstring contraction for 4 weeks
- Allograft: Full, unrestricted return to sports is usually delayed until at least 9 months

Full return to sports is individualized. Requirements for return to sports include near normal strength, flexibility, and endurance. Isokinetic (Biodex) strength testing is recommended at 3, 6, and 9 months to assist in evaluation. Dr. Mack and your physical therapist will work together to determine when you are ready to return to sports without restrictions. In most cases, full activities are not permitted prior to 6 months.

A knee brace and crutches are used in all cases during the first 4 weeks. The brace is removed to perform range of motion exercises, but worn locked in full extension during weight bearing. Two crutches are used for the first 2 weeks. Except for meniscal

repairs, one crutch (on the side opposite your surgery), or weight bearing without crutches is allowed during weeks 2-4 if quadriceps control is adequate.

ACL *DELAYED* REHABILITATION PROTOCOL

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Phase 1: Immediate (Weeks 1-2)

GOALS

- Control pain, swelling and inflammation
- Achieve ROM 0-90° and emphasize full extension
- Achieve control of quadriceps muscle to allow full weight bearing

EXERCISES

ROM

- Passive 0-90°
- CPM daily 4-6 hours
- Patellar mobilization
- Ankle pumps, calf stretches
- Wall/Heel slides
- Stationary bicycle (once ROM \geq 110° flexion)

Strength

- Quad sets
- Straight leg raises, calf raises

Weight Bearing

- Two crutches at all times
- Weight bear as tolerated with brace (except meniscal repairs)

Balance

- Single leg stance
- Side to side, front to back weight shift

Modalities

- Electrical stimulation
- Ice after exercise at 20 minute intervals (20 min on, 20 min off, repeat)

Brace

- Brace locked in extension at all times while walking
- Remove brace to exercise, sleep

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Phase 2: Early (Weeks 2-4)

GOALS

- Eliminate pain, swelling and inflammation
- Increase ROM 0-90° and maintain full extension
- Increase quadriceps strength to eliminate brace and crutches
- Improve patellar mobility
- Improve proprioception

EXERCISES

ROM

- Passive 0-90°
- Patellar mobilization
- Ankle pumps, calf stretches
- Wall/Heel slides
- Stationary bicycle

Strength

- Quad sets
- Straight leg raises in 4 planes, calf raises
- Two leg presses and mini squats (0-45°)
- Front and side lunges with body weight only
- Wall squats
- Begin hamstring stretches

Weight Bearing

- One crutch on side opposite of surgery until end of week 4
- Weight bear as tolerated with brace (including meniscal repairs)

Balance

- Single leg stance
- Side to side, front to back weight shift
- Balance board with both legs

Modalities

- Electrical stimulation
- Ice after exercise at 20 minute intervals (20 min on, 20 min off, repeat)

Brace

- Brace locked in extension at all times while walking until end of week 4
- Remove brace to exercise, sleep
- Fit for functional brace at Dr. Mack's office, as needed, at week 4-6

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Phase 3: Late-Early (Weeks 4-6)

GOALS

- Increase ROM 0-125°
- Increase quadriceps and hamstring strength, endurance, and control
- Improve patellar mobility
- Begin functional exercises

EXERCISES

ROM

- Passive 0-125°
- Patellar mobilization
- Ankle pumps, calf stretches
- Wall/Heel slides
- Stationary bicycle
- Continue hamstring stretches

Strength

- Quad sets
- Straight leg raises in 4 planes, calf raises
- Double leg leg presses and mini squats (0-45°)
- Front and side lunges with body weight only
- Wall squats
- Begin isolated hamstring curls
- Begin treadmill

- Begin isokinetic work
- Multi-hip

Weight Bearing

- Full weight bearing
- No crutches

Balance

- Single leg stance
- Side to side, front to back weight shift
- Balance board with both legs

Modalities

- Electrical stimulation
- Ice after exercise at 20 minute intervals (20 min on, 20 min off, repeat)

Brace

- Discontinue post-operative I-ROM brace at end of week 6
- Use functional brace as needed

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Phase 4: Intermediate (Weeks 6-12)

GOALS

- Increase ROM 0-135°
- Maintain quadriceps and hamstring strength, endurance, and control
- Enhance balance and proprioception

EXERCISES

ROM

- Continue all previous exercises, increase 0-135°

Strength

- Continue all previous exercises
- Increase plyometrics
- Begin jogging and running program
- Backward running

Balance

- Continue two legged balance board, progress to single leg
- Single leg stance

Modalities

- Ice after exercise at 20 minute intervals (20 min on, 20 min off, repeat)

Isokinetic (Biodex®) Test

- At 3 months (Dr. Mack's office will schedule)

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Phase 5: Late (Weeks 12-16)

GOALS

- Enhance strength, flexibility, and endurance
- Increase functional activities

EXERCISES

ROM

- Continue all previous exercises

Strength

- Continue all previous exercises
- Increase jogging and running
- Single leg press

Balance

- Continue all previous exercises

Modalities

- Ice after exercise at 20 minute intervals (20 min on, 20 min off, repeat)

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Phase 6: Return-to-Sports (Weeks 16-36)

GOALS

- Achieve maximal strength, flexibility, and endurance

- Increase sports specific drills and return to unrestricted sports

EXERCISES

ROM

- Continue all previous exercises

Strength

- Continue all previous exercises
- Increase jogging and running
- Backward running
- Single leg press

Balance

- Continue all previous exercises
- Begin sports-specific drills
- Begin cutting, figure of 8 drills

Modalities

- Ice after exercise at 20 minute intervals (20 min on, 20 min off, repeat)

Isokinetic (Biodex®) Test

- At 6 and 9 months (Dr. Mack's office will schedule)