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ACL Reconstruction Post-Operative Rehabilitation Protocol

The following is a generalized outline for rehabilitation following ACL reconstruction. The protocol may be modified if additional procedures, such as meniscus repair or microfracture, were performed.

Phase I: 1 – 14 days

Goals

- Protect graft and graft fixation with use of brace and specific exercises
- Control inflammation and swelling
- Early range of motion (ROM) with emphasis on full extension, patella mobilizations and flexion
Caution: avoid hyperextension greater than 10°
- Educate patient on rehabilitation progression
- Restore normal gait on level surfaces

Brace

- Post-op brace worn locked in extension for ambulation and sleeping
- May unlock for ROM exercises

Weightbearing status

- Weightbearing as tolerated with crutches and brace locked in extension
- If meniscal repair or microfracture, nonweightbearing for 4 weeks

Exercises

- Continuous Passive Motion (CPM) machine – 2 hour sessions, 3 times a day at slow, comfortable speed. Start at 50° of flexion, and increase 10° per day up to 90°
- ROM exercises (see figures below)
 - Extension – no active terminal extension from 40° to 0°
 - Passive extension – sit in a chair and place your heel on the edge of a stool or chair; relax thigh muscles and let the knee sag under it's own weight until maximum extension is achieved.
 - Heel props – place rolled up towel under the heel and allow leg to relax
 - Prone hangs – lie face down on a table/bed with the legs hanging off the edge of the table; allow the legs to sag into full extension.
 - Flexion – limit to 90°
 - Passive flexion – sit on chair/edge of bed and let knee bend under gravity; may use the other leg to support and control flexion
 - Wall slides – Lie on your back with the involved foot on the wall and allow the foot to slide down the wall by bending the knee; use other leg to apply pressure downward.

- Heel slides – Use your good leg to pull the involved heel toward the buttocks, flexing the knee. Hold for 5 seconds; straighten the leg by sliding the heel downward and hold for 5 seconds.

- Quadriceps sets in full extension
- Straight leg raises in brace locked in extension
- Hamstring sets
- Patella mobilization
- Isometric hip abduction, adduction
- Ankle ROM and gastroc-soleus strengthening with tubing/therabands

Phase II: Weeks 3 – 6

Goals

- Restore normal gait with stair climbing
- Maintain full extension, progress toward full flexion range of motion
- Protect graft and graft fixation
- Increase hip, quadriceps, hamstring and calf strength
- Increase proprioception

Brace

- May wean out of post brace when demonstrate good quad control

Weightbearing status

- Weightbearing as tolerated, wean off crutches

Exercises

- Continue as above, maintaining full extension and progressing to 125°
- No active terminal extension from 40° to 0°
- Begin closed kinetic chain exercises
- Stationary bicycling, stairmaster: slow, progressing to low resistance
- Hamstring curls
- Hip abduction, adduction, extension
- At 4- 6 weeks, ¼ partial squats, use table for support

Phase III: Weeks 6 – 12

Goals

- Full active range of motion
- Increase strength

Exercises

- Stationary bicycling, stairmaster, elliptical: increases resistance
- Treadmill walking
- Swimming, water conditioning: flutter kick only
- Balance and proprioceptive training
- Closed chain quad strengthening: no knee flexion greater than 90° with leg press

Phase IV: Months 3 – 6

Goals

- Improve strength, endurance and proprioception
- Begin agility training

Brace

- Functional ACL brace

Exercises

- May start jogging program, forward/straight running only
- Continue and progress strengthening
- Progress to running program at 5 months
- Begin agility training at 5 months
 - Side steps
 - Crossovers
 - Figure 8 running
 - Shuttle running
 - One leg and two leg jumping
 - Cutting
 - Acceleration/deceleration/sprints
 - Agility ladder drills
- Initiate sport-specific drills as appropriate

Phase V: 6 months post-op

Goals

- Maintain strength, endurance and proprioception
- Safe return to sport

Brace

- Functional ACL brace for contact sports, jumping and landing or cutting and twisting until 1 year postop, then per patient preference

Exercises

- Gradual return to sports participation
- Maintenance program for strength, endurance

Return to sports criteria

- MD clearance
- Full range of motion
- No swelling
- Good stability on ligament testing
- Full strength compared to other leg
- Completed sport-specific functional progression
- Running and jumping without pain or limp

EXERCISE FIGURES

Heel props



Prone hangs



Passive flexion



Wall slides



Heel slides



Straight leg raises



Partial ¼ squats

