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