JAGLOWSKI ORTHOPEDIC INSTITUTE

Anterior Cruciate Ligament (ACL) Reconstruction

Rehabilitation Protocol

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**** The following instructions represent general guidelines. Your personal instructions may be slightly different and will be conveyed to you by Dr. Jaglowski if this is the case. Post-operative instructions, physical therapy protocols, and useful information regarding your post-op care may be found electronically at www.jagsortho.com.****

Overview

Initially, one of the most important aspects after an ACL reconstruction is to ***maintain full knee extension*** (the leg must be straight). Usually, the most comfortable position for the knee is with it flexed slightly. However, if one sits with a pillow under the knee in a position of flexion for too long, the hamstrings will go into spasm, and it may be difficult to maintain full knee extension. If this were to happen over the long term, this could become permanent, as scar tissue may form in the knee, which could limit full range of motion. Therefore, we recommend that pillows be placed under the ankles with the leg out in full extension immediately, such that gravity can help your knee to maintain full extension. In addition, it is recommended that all patients achieve 90° of knee flexion within the first week or so after an ACL reconstruction. If you cannot maintain full extension or get past 90° of knee flexion, you should be evaluated by your surgeon.

After an ACL reconstruction, your knee will be placed into a hinged knee brace (Bledsoe brace) to keep it in full extension. This helps to protect your graft while your knee muscles are returning back to normal strength. In most patients, the quadriceps muscles shut down somewhat after an ACL reconstruction and it is difficult to perform a straight leg raise without having the knee sag. You should plan on using the hinged knee brace until you can perform a straight leg raise without a sag. Once you can do this, it is safe to discontinue the use of the brace. This typically happens within 3-4 weeks after surgery and should be conveyed to Dr. Jaglowski by the physical therapist. Most patients will be made touch down weight bearing (TDWB) for the first 2 weeks after surgery and progressed to weight bearing as tolerated (WBAT) at their 2-week post-operative visit. This may be different if you had meniscal or cartilage repair performed. You will use crutches to allow you to slowly increase your weight bearing initially after surgery with plans to progress

from 2 crutches wit TDWB, to using 1 crutch with WBAT under the opposite arm once a more normal gait is achieved. One should plan on bringing the opposite arm crutch forward at the same time as the operative knee in a reciprocal gait pattern. This will be taught to you by your physical therapist. It is important not to put the crutch under the same arm as the operative knee, as an incorrect gait mechanism will develop. Once you can walk without a limp, it is safe to discontinue use of the crutches. This usually takes 2-4 weeks for most patients. It is very important not to limp after an ACL reconstruction. Therefore, if necessary, it is better for you in the long term to take more time and to continue using crutches until you can walk normally, rather than discontinuing the crutches within the 2–4-week period of time without a normal gait pattern. The basic quadriceps exercises that one should perform after an ACL reconstruction are straight leg raises (in the hinged knee brace) and quadriceps setting (tightening for six seconds, followed by relaxing; repeat) exercises.

General Return to Sport Guidelines (may vary depending on your recovery):
- Outdoor Biking, Golf, Running, Hiking: ≈5 months
- Basketball, Tennis, Football, Soccer, Skiing: ≈6-7 months

Post-op Positioning:

1. Compression dressing, ice to knee as directed.
2. Hinged knee brace with knee in straight (0°) extension or minimally flexed when crutching.
3. Proper knee elevation.
4. Immediate quadriceps sets; ankle pumps encouraged.

Postop Week 1-4:

1. Obtain full passive extension (0°) **(essential)**.
2. No pillow under knee at any time for first 6 weeks. Pillows should always support foot/ankle while in bed.
3. Quadriceps sets - 30 reps, 3-5 times daily. Fire quadriceps hard for 6 seconds. Relax for 3 seconds. Repeat.
4. Ankle pumps every hour.
5. TDWB (first 2 weeks) with crutches. Patient will usually self-limit weight bearing. Once you can walk without a limp, it is safe to discontinue use of the crutches. This usually takes 2-4 weeks for most patients. It is very important not to limp after an ACL reconstruction.
6. Dressing changes at Day 3. Rewrap with sterile gauze and ace wrap.
7. Achieve 90° of flexion by Postop day 7-10.
8. Exercises (out of brace):
    a. Quadriceps sets.
    b. Active assisted knee flexion (sitting).
    c. Hamstring stretches.
    d. Passive extension to 0°. (Several times daily)
    e. Standing hamstring curls.
9. Hinged knee brace use: May discontinue once able to perform a straight leg raise without an extension sag. Typically, patients will require brace for 3-4 weeks following surgery. You surgeon and physical therapist will advise you when it is safe to discontinue use of your brace.

Crutch Ambulation Protocol:

1. TDWB with crutches for 2 weeks then progression to WBAT depending on recovery.
2. After 2 weeks, may progress to 1 crutch (on opposite side) once quadriceps function and gait mechanics are normal.
3. Discontinue the 1 crutch once gait mechanics are normal (no limping).

Post-op Weeks 4-6:

1. Goals:
   a. Top priority - obtain full (0°) knee extension.
   b. Increase knee range of motion in flexion.
   c. Increase quadriceps strength in preparation for progression to ambulation without use of crutches.
2. Exercise program:
   a. Continue hinged knee brace at full extension or slight flexion until able to perform a straight leg raise without a sag (typically 3-4 weeks).
   b. Flexion exercises:
      1. Active assisted knee flexion (with overpressure - goal is 130°).
      2. Biking as tolerated to 30 minutes (no or very low resistance).
   c. Progressive resistance exercises: (30-50 repetitions, 0-5 lbs, 3 times daily):
      1. Straight leg raises (maintain full extension).
      2. Hamstring curls.
      3. Hip flexion, extension, and abduction.

** If any of these exercises seem to aggravate the knee (swelling, pain, or tenderness), then that specific exercise which causes the difficulty should be postponed until you have discussed the effects of the exercise with your therapist**

Post-op Weeks 7-12:

1. Goals:
   a. Achieve full extension to near full flexion.
   b. Improve quadriceps tone (return of VMO definition).
2. Exercise program:
   a. Quadriceps. Straight leg raises (10 sets of 30 repetitions each), and quadriceps setting (10 sets of 30 repetitions each). Continue stationary bike as tolerated. Increase resistance based on knee symptoms (20 minutes, 3-5 times/week).
   b. Hip muscle groups. May progress by adding weights above the knee. Hip abductors, flexors, abductors, extensors (10 repetitions, 4 sets daily). An isometric variation can be performed by pushing down on the hip being worked on and sustaining a contraction for 10 seconds.
   c. Hamstring curls. May add weights around the ankle (10 repetitions, 4 times daily).
   d. Calf raises. 3 sets, 10 repetitions - fast and slow sets (each).
   e. Swimming. Flutter kick only - gentle. No whip kick.
   f. Accelerated program. Start with sand bags or strap on weights at tibial tubercle. Perform straight leg raises (10 sets, 10 repetitions each) and progress fulcrum distally 1 inch per week.
   g. Walking (level ground). Build up pace gradually. Feel big toe of affected foot push off as you walk to ensure normal gait pattern. Start off at 1 mile at brisk pace, increase to 3 miles. No limping allowed.
   h. Biking with increasing resistance permitted, must have at least 100-115° of knee flexion.

Post-op Weeks 12-16:

1. Goals:
   a. Full knee range of motion. Refer back to surgeon for extension restriction of 5° or if less than 120° flexion.
   b. Normal gait pattern.
   c. Progressively increasing functional strengthening program.
2. Exercises:
   a. Continue with exercise program from week 7-12.
   b. Weight room activities:
      1. Leg press. Press body weight as many times as possible on nonsurgical side (to fatigue). Follow same sequence on surgical side.
      2. Squat rack. 2 squats at 1/2 body weight, 10 repetitions. Progress to full body weight as tolerated.
   c. Continue biking and/or swimming daily. No whip kicks.

Post-op Months 4-7:

1. Goals:
   a. Improve quadriceps strength/function, endurance; progress to jogging program.
   b. Improve coordination/proprioception.
2. Exercises:
   a. Jogging (level surfaces). ½ speed jog (level surfaces only). Initially alternate 100 yards walking/jogging over 1 mile. Build up to 1 mile by 5 months postop. Progress to 15 minutes at 8-10 minutes/mile pace. Add 5 minutes per week. Perform daily.
   b. Biking. By now the amount of set resistance should be increasing. Perform daily at 20 minutes a day. Legs should feel drained once off the bike.
   c. Step-ups (face the step). Put foot of operative knee on step and step up on the step. Repeat with gradual build up in repetitions until doing 100 step-ups per day. Try to lower from the step twice as long as it takes to raise up on the step.
   d. Agility drills:
      1. Balancing on a teeter-totter board or disc on a half-croquet ball.
      2. Figure 8's. Daily. 5 minutes 1/2 speed. Tighten circle size down.
   e. Sports on own- ***MUST BE CLEARED BY SURGEON FIRST***
      Outdoor Biking, Golf, Running, Hiking: ≈5 months
      Basketball, Tennis, Football, Soccer, Skiing: ≈6-7 months

Post-op Months 7-9:

1. Shuttle runs daily. 5 minutes. 2 speeds. 10-12 repetitions.
2. Zig-zag running. Angle across a distance of 10-15 yards, then angle back across field to another boundary 10 - 15 yards apart. Continue for 100 yards. Tighten up as strength/endurance permits.
3. Cycling Program: Increase daily cycling program speed and resistance. Minimum 20 minutes daily or every other day.
4. Hills/stairs. Running up hills and stairs can be utilized to help build muscle mass and strength. Care should be taken running downhill and down steps. This can irritate the knee and should be one of the last exercises added to the program.

Post-op Full Rehabilitation:

1. No competitive or pivot sports until cleared by surgeon. – Surgeon may require that you pass a **Sports Test** prior to competition. Brace should be well fitting.
2. Quadriceps/thigh circumference should be within 1 cm of nonoperative (if normal) side.
3. Weekly strengthening program independently (2-3 times/week).
    a. Full speed jog/run, 20-30 minutes, 6-7 minutes/mile or best pace.
    b. Exercise stationary bike. Increasing resistance. Set bike so low leg is flexed no more than 10-15°, 20 minutes.
    c. Agility drills (figure 8's, shuttle runs, turns), teeter-totter balancing.
    d. Continue quadriceps sets, SLR's (300 repetitions/day).