VCU Sports Medicine Clinic

Anterior cruciate ligament (ACL) reconstruction protocol

This protocol is designed to serve as a patient guide to rehabilitation following an ACL repair procedure. Time frames allow for optimal healing, and should be used as criteria for advancement along with a patient's functional ability.

Protective phase (weeks 1-2)

Goals

1. Reduce swelling
2. Work toward full extension
3. Tolerate weight bearing
4. Achieve quad activation
5. Reduce postoperative pain

Note: It is essential to aim for good core stabilization and postural control with exercises throughout all rehab stages. Poor core control may indicate an exercise is too advanced for the patient.

Precautions

1. With all grafts, the brace will remain locked in extension for four weeks with weight-bearing activities, then unlocked for four weeks.
2. Two months post-op, the patient will receive a hinged-knee sleeve to wear with exercises and at work or school.
3. If ACL reconstruction is associated with a meniscus repair, range of motion is limited to 0 to 90 degrees for four weeks. After four weeks, range of motion may be advanced as tolerated but closed chain strengthening should be limited to nothing past 90 degrees of flexion for the first several months.

Exercises

- Patellar mobilization
- Isometrics (quadriceps, gluteals, hamstrings)
- Straight leg raises
- Heel slides (seated or supine)
- Long sit hamstring stretch
- Prone terminal knee extensions
- Weight shifting/box steps
- Gait activation (if appropriate quad control)
- Trunk stabilization exercises

Modalities

Electrical stimulation, cryotherapy, biofeedback

Controlled stabilization (weeks 2-4)

Goals

1. Moving to closed chain/proprioceptive activities
2. Achieve full knee extension
3. Normalized gait free of assistive devices
4. Flexion $\geq$ 90 degrees
5. No active extensor lag

Exercises

- Stationary cycling (when range of motion allows)
- In-line heel to toe walking (forward and back, cueing as needed to achieve normal gait pattern)
- Cone stepping
- Single leg standing
- Mini-squats
- Band-resisted: Standing knee extension (closed chain, band behind knee), side stepping (straight, diagonals, circles), heel slides (or rolling stool pulls), seated hip internal and external rotations, four-way stabilizations kicks (if good quad control present), leg press to 45 degrees, leg curls

Note: Continue to progress previous exercises unless they are discontinued or replaced by a higher level activity by your physician. Activities to maintain general conditioning (upper-body strengthening, cardiovascular endurance) may be initiated once post-op pain and side effects are under control. These activities include upper-body weightlifting with stressing leg and pool therapy (after four weeks). However, the patient should not shift their primary focus from rehabilitating the operative knee.

Modalities

Continued E-stim until good quadriceps control achieved, cryotherapy, cross friction massage over scar adhesions (when healed)

Functional strengthening (weeks 4-6)

Goals

1. Full extension
2. Comfortable reciprocal stair climbing
3. Normal speed with gait

Note: Notify your physician if full extension has not been achieved by four weeks.

Exercises

- Progressive squats
- Progressive step-ups (forward, side, back, 4-8 inch step)
- One-fourth lunges
- Single leg balance with opposite leg reaches
- Fast-form walking (start in clinic with therapist and progress gradually)
- Retrograde treadmill walking
- Stationary bike or stepper
- Sport cord resisted walking
- Swiss ball or foam roller dynamic stabilization exercises

Modalities

Cryotherapy, others as needed

Weeks 6-8

Goals

1. Continue as previous
2. Progressing volume and intensity as tolerated
3. Monitor and address signs of patellofemoral pain

Exercises

- Two-footed hopping or light jump roping
- Five-point agility drills (star drills)
- Lateral hops over 6-8 inch mat or box
- Sliding board, hopping over line or ladder drills

Weeks 8-10

Exercises

- Pre-squats
- Lunges
- Step ups
- Long-distance fast-form walking (two to four miles)
- Circuit training drill for 20 minutes (15 to 20 stations, 45 seconds work/15 seconds rest)

Weeks 10-12

Exercises

- Walk/jog progression starting with 1 ½-mile walk with half-mile jog straight forward (Progress increasing jog and decreasing walk distances by half mile as tolerated. When patient can jog two miles without pain or swelling, they may start straight ahead running at half speed.)

Weeks 12-16

Exercises

- Low intensity vertical plyometrics
- Three-fourth speed sprints if progressed as above on smooth surface
- Carioca drills (walking to half speed to three-fourth speed)
- Figure 8 jogging progression
- Functional sport-specific training in controlled environment with trainer or therapist

Weeks 16-24

- Continue total body fitness, strengthening and endurance training
- Patient will be evaluated at six months to consider release back to full activity, no sooner
- If the physician decides at six-month follow up that a functional brace will be needed, the patient will be measured for one
- A functional test will be ordered at the discretion of the physician