
Anterior Cruciate Ligament (ACL) Reconstruction Rehab Protocol

Rehabilitation Progression

The following is a general guideline for progression of rehabilitation following Anterior Cruciate Ligament (ACL) reconstruction with autograft hamstring tendons. Progression through each phase should take into account individual patient status (e.g. healing, function) and physician advisement. Please consult Dr. Thieken if there is any uncertainty concerning advancement of a patient to the next phase of rehabilitation.

General Guidelines

- Supervised physical therapy typically takes place once or twice a week for six to nine months.
- At least nine months before return to full sports participation.
- The post-operative knee brace will remain locked with weight bearing activities until the patient demonstrates good quadriceps control (typically two to three weeks), then unlocked for an additional one to two weeks.
- The brace does not need to be worn when the patient is sitting or lying down.
- Crutches/walker should be used until tolerating full weight on the operative leg.
- Time frames for use of the brace and/or crutches may be extended by Dr. Thieken or the physical therapist.
- If a meniscal repair is performed at the time of ACL reconstruction, then range of motion will be limited to 0 to 90 degrees and weight bearing will be limited to 20 pounds on the operative leg for four weeks.
- For hamstring autografts, hamstring stretching and isolated hamstring strengthening is restricted for six weeks.
- It is essential for the patient to have good core stabilization and postural control with exercises throughout all rehabilitation phases. Poor core control may indicate an exercise is too advanced for the patient.
- Reestablishment of full extension is of extreme importance in order to normalize gait.
- Avoid twisting or pivoting with daily activities for the first 12 weeks post-operatively.
- Avoid leg extension exercises with resistance indefinitely.

Phase I: Protective (Weeks 0 to 3)

Goals

- Reduce swelling
- Achieve full extension
- Advance flexion as tolerated (achieve a minimum of 90 degrees by two weeks post-operatively)
- Tolerate weight bearing
- Achieve quad activation
- Protect graft fixation
- Educate patient on rehabilitation progression

Modalities

- E-stim, cryotherapy, biofeedback

Weight Bearing

- As tolerated with crutches or a walker. Once able to perform a straight leg raise (SLR) without extensor lag, may progress to one crutch then full weight bearing with normal gait pattern. No limping.
- If a meniscal repair is performed at the time of ACL reconstruction, then range of motion will be limited to 0 to 90 degrees and weight bearing will be limited to 20 pounds on the operative leg for four weeks.

Brace

- Only worn when ambulating or standing.
- May unlock brace when able to perform a SLR without extensor lag and then discontinue brace one to two weeks later (typically three to four weeks).

Exercises

- Emphasize full extension
- Achieve active range of motion (AROM) as soon as tolerated
- Patellar mobilizations
- Heel props
- Isometrics (quadriceps, glutes)
- Ankle pumps
- Quad sets
- Heel raises
- Heel slides
- Non-weight bearing gastroc/soleus stretching
- Straight leg raises, all planes, with brace in full extension until quadriceps strength sufficient to prevent extensor lag
- Gait activities (if good quadriceps control)
- Prone and/or side lying leg circles with emphasis on trunk stabilization
- Trunk stabilization exercises
- Prone hangs if struggling with regaining full extension

Phase II: Controlled Stabilization (Weeks 3 to 6)

Goals

- Normalize gait
- Achieve full extension
- Continue to advance flexion as tolerated
- No active extensor lag
- Moving to closed chain and proprioceptive exercises
- Discontinue use of the brace

Modalities

- E-stim until good quadriceps control, cryotherapy, scar massage when healed

Exercises

- In line heel-toe walking
- Single leg standing
- Stationary bike as range of motion allows (high seat, low resistance to start)
- Mini squats (30 degrees)
- Begin leg presses eccentrically with light weights (90 to 40 degree arc then advance to 120 to 30 degree arc)
- Seated hip internal and external rotation
- Side stepping
- Standing knee extension

Activities to maintain general conditioning (e.g. upper body strengthening, cardiovascular endurance) may be initiated once post-operative pain and side effects are under control. These activities may include upper body exercise, upper body weight lifting without stressing operative leg and pool therapy (after four weeks and incisions completely healed).

Phase III: Functional Strengthening (Weeks 6 to 14)

Goals

- Full AROM
- Comfortable and reciprocal stair climbing
- Normal gait pattern and speed
- Monitor and address signs of patellofemoral pain

Weeks 6 to 10

Exercises

- Progressive squats
- Progressive step-ups (all directions)
- Quarter lunges
- Hamstring stretching
- StairMaster
- Reverse treadmill walking
- Progress proprioceptive exercises

Weeks 10 to 14

Modalities

- Cryotherapy, others as needed

Exercises

- Two footed hopping/jump roping
- Five-point agility drills (star drills)
- Lateral hops over six to eight inch mat
- Sliding board
- Ladder drills
- Aquatic program, if able
- Fast form walking
- Squats, lunges, step-ups
- Progressive hamstring strengthening
- Circuit training drills
- Begin walk/jog progression at 12 weeks

Phase IV: Performance (Weeks 14 to 28)

Goals

- Full, pain-free ROM
- No patellofemoral joint irritation
- Progress strength, power, proprioception

Exercises

- Walk/jog progression
- Continue to progress flexibility and strengthening program
- Begin low intensity vertical plyometrics

Phase V: Return to Sport (Weeks 28 to 36)

Goals

- Safe return to athletics
- Maintenance of strength, endurance and proprioception

Exercises

- Advance plyometric program
- Figure eight jogging
- Cutting, crossover and carioca drills
- Sport specific drills in controlled environment with trainer or physical therapist
- Continue total body fitness, strengthening and endurance training

Return to Full Sports Participation When

- Strength is 95% on single leg hop test or high velocity isometric test
- Functional progression to sport has been accomplished without increased pain or swelling
- Patient is at least nine months post-op

Release to full sports participation is on a case by case basis and determined by Dr. Thielen and the physical therapist.