

## POSTERIOR CRUCIATE LIGAMENT RECONSTRUCTION POSTOPERATIVE REHABILITATION PROTOCOL

The range of motion allowed after posterior cruciate ligament reconstructive surgery is dependent upon the stability obtained at the time of surgery. Range of motion exercises are initiated at the surgeon's discretion in the initial six weeks postoperatively.

### GOALS:

1. Learn 0-6 weeks home exercise program prior to hospital discharge.

No weight bearing, with crutches, should be followed for six weeks (until the bone plugs heal in the tunnel).

Weaning off crutches should start with use of crutch on contralateral side at 6 weeks.

This crutch may be discontinued when the patient can walk without a limp.

2. Patient should attend physician and/or physical therapy follow-up to assess range of motion and overall tibiofemoral joint stability after reconstruction.

3. Patient may initiate closed chain exercises as able. With the foot planted in closed chain exercises, there is less shear on the reconstruction. Closed chain activities may include:

A. Biking with no resistance (once knee flexion to 115 degrees achieved).

B. Stair climbers (at 6 weeks)

C. Wall sits (at 6 weeks)

4. Avoid open chain hamstring work - this may put extra stress on the healing graft until the bone tunnels have healed (4 months).

Frequently Asked Questions:

1. Bathing/showering - 7-10 days postop - once surgical incision has completely healed.
2. Automobile driving - 6-8 weeks postop (for right knee or clutch foot)
3. Full weight bearing without crutches - starting at 6 weeks postop with physician clearance once there is no limp.

**WEEK 0-3:**

1. Straight Leg Raises in brace. Do not allow knee flexion.  
Hold for 5 seconds and lower. (build up to 10 sets, 30 reps, per day)
2. Hip Extension exercises. While standing against a counter, desk, or table, lift operative limb (with the knee braced) behind you. Avoid bending forward at the waist. (build up to 10 sets, 10 reps per day).
3. Hip Abduction exercises. While standing, in brace, and holding onto a counter or table, lift the operative limb out to the side. Hold for 5 seconds, then relax slowly (build up to 10 sets, 10 reps., per day)
4. Range of Motion. Verify extent with surgeon. Gentle

active-assisted ROM (flex heel of operative limb against ankle of contralateral limb and gently flex) to maximum of 90 degrees. Perform with brace on. Protect against posterior tibial sagging during this program.

5. Quadriceps Sets. Fire quadriceps muscle mass and hold for 6 seconds, then relax for 3 seconds (10 sets of 30 reps., per day).

\*Special consideration for first 6 weeks, place pillow under proximal tibia at rest to prevent posterior sag.

**WEEK 4-6:**

1. Range of Motion. Patient may begin to come out of brace to work on ROM. The brace must be worn for protection whenever the patient is up. Continue active assisted range of motion to 90 degrees.

2. Straight Leg Raises. 10 sets, 30 reps., per day - done in brace - no sag allowed.

3. Quadriceps Sets. 10 sets, 30 reps., per day

4. Hip Extension. 10 sets, 10 reps., per day

5. Hip Abduction. 10 sets, 10 reps., per day. May also be performed by lying on nonoperative side and lifting operative limb towards the ceiling. Be careful that hip and leg do not roll forward with this exercise.

## **WEEK 6-12:**

### GOALS:

1. Normal gait pattern, initiate weight bearing.
2. Improve quadriceps muscle tone, girth.
3. Improvement of range of motion from full extension to at least 125 degrees of flexion.

### PROGRAM:

1. Range of Motion. Active, active assisted, passive ROM exercises four times a day.
2. Ambulation. Progress to one crutch on the nonoperative side once normal gait pattern is achieved with full weight bearing on crutches. The one crutch must come forward and make ground contact in synchrony with the operative limb. Once a normal gait pattern is established, the crutch may be discarded. There should be no limping as this will promote posterior tibialis pain, semimembranosus bursitis, and sacroiliac joint dysfunction.
3. Continue straight leg raises, quadriceps sets, hip extension, and hip abduction exercises daily. Weight may be added proximal to the knee joint (on the thigh) as strength permits.
4. Stationary Bicycle. Once 115 degrees of flexion is achieved, the use of a stationary bike is allowed. The seat

height should be set so that the lower leg should have the knee flexed a little. Start off with no resistance. Progress from 5 minutes to 20 minutes as strength permits. The foot should be placed slightly forward on the pedal (without toe clips) to minimize hamstring activity.

5. Calf Raises. Perform with knee straight with heels over the edge of a step or curb. Perform 3 sets daily of 10 repetitions done slow and fast (each).

6. Hamstring Curls. Perform standing and lift heel up behind you. Lift a maximum of 5 pounds of ankle weights until 8 weeks postop.

7. Swimming. Allowed but no whip kick. Ambulation in chest high water also permitted. (Laps around pool or lane)

8. Stairmaster. Permitted at 8 weeks. Progress as tolerated with low resistance initially. Work up to ten to twelve minutes per day.

9. Wall Slides (from 0-45 degrees). Progress to mini-squats as tolerated.

10. Pool Ambulation allowed. Work on normal gait mechanics in ambulation in pool (heel-toe gait).

11. Leg Presses - Light weight, to maximum of 90 degrees of knee flexion (start off at 25% of body weight).

**WEEK 13-16:**

1. Straight Leg Raises. May move weight to tibial tubercle region and progress distally on the tibia an inch/week.

Maximum of 10 pounds.

2. Continue hip abductors, quadriceps sets, hip extension exercises.

3. Stationary Bicycle. Increase resistance as tolerated. Thighs should feel "drained" once get off bike, but should not feel exhausted.

4. Range of Motion Program. Flexion should achieve to 125 degrees or full flexion by this point.

5. Ambulation. Ambulation out of brace on level ground permitted. Start off at ¼ mile and progress to 2 miles at a brisk pace everyday. There should be no limping.

6. Swimming. Continue same program. No whip kicks allowed.

7. Hamstring Curls, Calf Raises. Continue daily.

8. Stairmaster. Work up to 12-16 minutes per session.

Increase resistance as tolerated.

9. Squats. Three quarter squats, 20 reps., 10 sets, everyday.

Initially perform with no weights and progress to ½ body weight as strength/endurance allows.

## **WEEK 17-20:**

### **GOALS:**

1. Achieve full range of motion by this point. It is not unusual for the last 10-15 degrees of knee flexion to take up to 5 months to achieve.
2. Want quadriceps to be 70% of body weight/unaffected leg. Thigh circumference measured at 15 cm above the superior pole of the patella should be within 2 cm of the contralateral (normal) thigh.
3. Progress functionally in activities and avoid patellofemoral irritation.

### **PROGRAM:**

1. Follow week 13-16 protocol.
2. May progress to run/jog once thigh circumference is within 2 cm of unaffected/nonoperative thigh. Initially jog  $\frac{1}{4}$  mile and repeat. Build up to 2 miles per day. Add  $\frac{1}{8}$  -  $\frac{1}{4}$  mile per week as strength permits. Walk  $\frac{1}{2}$  mile at end of session at brisk pace to cool down.

## **WEEK 21-ON:**

### **GOALS:**

1. Continue with functional training program on a daily basis (walk/run, biking stairmaster, squats, exercises).

2. Practice sport of choice on own in a noncompetitive manner.

3. Add ACL agility drill program.

**RETURN TO SPORTS/WORK:**

1. Want quadriceps to be at least 80% of body weight/contralateral side.

2. No pivot sports for 6 months.

3. No contact sports for 9 months unless cleared by surgeon.

4. May be fit for functional brace once thigh circumference is within 1" of normal side.

\*Returning to sports means the presence of the necessary joint range of motion, muscle strength and endurance, and proprioception to safely return to work or athletic participation.

**KEY POINTS TO CLINICAL FOLLOW-UP:**

1. Six Weeks. Must achieve full extension. Lateral knee x-ray taken to confirm healing of bone tunnels. Patients with allografts may experience some mild delayed healing of the tunnels. (This is normal).

2. Twelve Weeks. Achieve flexion to 125 degrees.

3. Sixteen to Twenty Weeks. Thigh circumference should be within 2.5 cm (one inch) of normal (unaffected) side.

4. Six Months. Assessment of return to sports.

5. Yearly. Clinical follow-up to assess subtle changes in stability or any evidence of early arthritic changes. Notify surgeon of any change of address so you are not lost to follow-up for our research studies.