DMC
Sports Medicine

Rehabilitation protocol
ACL Reconstruction

<u>PATIENT INFORMATION</u>

BEFORE YOUR SURGERY:

You will meet with an orthopaedic assistant to go over the fundamentals of the rehabilitation program that will be required following reconstructive surgery. This meeting will allow you to discuss the exercise program that will be required for you to regain normal use of your knee following surgery. It is imperative that you understand and follow the rehabilitation exercises in order to assure a safe and effective recovery from your surgery.

In general, most patients will perform exercises at home without a physical therapist's supervision for the first two weeks following their surgery. You must have a clear understanding of the exercises to be performed to maximize your recovery. Please be sure to address any questions that you have to the orthopaedic assistant, or your physician in an effort to minimize confusion.

Most patients will be discharged home the day of surgery. You will be expected to start the exercises on the first day after surgery, and continue doing them three times a day until you see your physician for follow-up. Other patients may be admitted overnight for observation, and will be seen by the physical therapist the first week after surgery to review the rehab program.

DAY OF SURGERY: (please bring protocol with you to the surgery or first post-operative appointment so this section can be completed)

Your ACL was reconstructed with (circle):

(a) Patellar tendon autograft **<u>OR</u>** allograft
(b) Hamstring tendons autograft **<u>OR</u>** allograft
(c) Quadriceps tendon
(d) Other allograft

Your arthroscopy showed (circle):

1. Torn meniscus cartilage
2. Arthritis / damaged articular (joint) cartilage
3. Plica
4. Loose Body
5. Abnormal tracking of the patella

This was treated by (circle):

(a) Trimming torn meniscus
(b) Repair of torn meniscus
(c) Shaving of arthritis / damaged joint cartilage

(d) Removing plica
(e) Removing loose body
(f) Lateral release of the patella
(g) Microfracture
(h) Transplanting cartilage plugs

AFTER YOUR SURGERY:

Immediately after your surgery you may not feel pain; this is because your knee may have been injected with a local anesthetic. You also may have a nerve block. This will help keep you leg numb and pain free following your surgery. Several hours after the surgery the anesthetic will wear off and you may begin to feel pain. A prescription for pain medication has been provided and should be filled. Apply an ice bag to the knee to relieve the pain and minimize the swelling. Your leg will be placed in a postoperative brace while in the operating room. Your incisions will be determined by what your graft choice was. You also will have another incision used to place the ACL graft in your knee and sometimes to harvest the ACL graft (if you chose to have your own tendon as the graft). This is closed with suture under the skin that will be absorbed and steri-strips on the skin.

Forty-eight hours after the procedure you may remove the dressings. You may shower, pat the area dry and place bandaids over the sites. Do not soak incision.

FIRST TWO WEEKS FOLLOWING DISCHARGE FROM THE HOSPITAL:

Your brace should be on at all times including for sleep. You may unlock the brace for riding in a car, and when sitting in a chair for comfort. When up and weight bearing the brace should be on and locked in extension (straight). Always wear the brace with straps tightened when walking. You should continue to use your crutches when walking. Continue to wear the compressive dressing (TED stocking) on your leg until you are completely out of the brace (4-6 weeks).

Keep the incisions dry for the first 2 days following your surgery. After that, you may shower and wash the wounds with soap and water. Cover the wound with bandaids or pads for the first 7-10 days following the surgery or as long as there is drainage from the wounds. If you notice signs of infection, such as redness or pus drainage, please call the office. Do not take a bath, swim or use a hot tub until you talk to your surgeon.

To keep your leg elevated at night, place some pillows or a rolled up blanket under your ankle and foot. **Do not place anything behind the knee. As much as you work on bending your knee, it is also important to work on making the leg straight.**

Try to take your pain medication a ½ hour before starting your exercises. Also, do not take the medication on an empty stomach as this can upset your stomach.

	0-2 weeks	**3-4 weeks**	**5-6 weeks**
Brace	Wear at all times locked in extension **Except** -- may unlock when sitting -- may remove for exercise	Continue to use long brace at night locked in extension.	If strength adequate may start to discontinue * still use on dangerous surfaces **(ice, snow, etc.)**
Crutches	Always for walking	Discontinue	Discontinue
TEDS	Wear on operated leg	Continue to use	Discontinue

ACL Reconstruction Rehabilitation Guidelines

REHAB MODIFICATION FOR CONCOMITANT PROCEDURES:

Combined ACL/PCL Reconstruction

1. Follow the established guidelines for PCL reconstruction
2. Restrict OKC knee extensions from 75 to 60 degrees
3. Utilize CKC exercises to improve quadriceps and hamstring function

ACL with Meniscus Repair

1. 2 weeks NWB, 2 weeks 50% WB, then WBAT
2. No active flexion > 90° x 6 weeks: PROM only >90°

Posterior Lateral Corner/ Lateral Collateral Ligament Injury

1. Typically involved with PCL injury or ACL injury—follow established guidelines for the appropriate injury
2. Injury to the PLC results in posterolateral laxity—Protect
3. Injury to LCL results in Varus Laxity
    - Minimize Varus Stresses
    - WBAT with knee locked in extension x 6 weeks
    - D/C crutches at 6 week-8 weeks if goals are met
    - ROM 0-90 degrees or per PCL guidelines – AVOID hyperextension
    - Perform flexion passively to avoid undue stress imposed by active contraction of hamstrings x 6 weeks
    - Progress OKC exercises as tolerated by PF joint (limit 60 degrees if with PCL reconstruction also)
    - CKC exercises as tolerated at 6 weeks and FWB
    - Avoid: OKC Flexion, Hip abduction with resistance to distal knee

Weeks 0-2

Goals:

1. Maintain full extension of the knee
2. Decrease swelling
3. Regain muscle tone of the leg
4. Regain flexion of the knee to at least 90°

EXERCISE (3-4 TIMES A DAY) – Remove the brace during the exercises

Early post-operative period (week 1)

1. Ankle pumps
2. Quadriceps setting
3. Hamstring setting
4. Straight-leg raises
5. Hip abduction
6. Hip adduction
7. Prone hip extension
8. Prone leg curls
9. Seated knee flexion
10. Heel slides

11. Prone passive knee extension stretch
12. Hamstring stretching
13. Patella mobilization
    - Superior glides
    - Inferior glides
    - Medial / lateral glides

Apply an ice bag to your knee for 15-20 minutes after each exercise session to reduce swelling and control pain.

At about two weeks following the surgery (if no meniscal repair), you may start walking without the crutches, but you must still wear the knee brace locked in extension for any standing or walking activities.

Maintenance of full extension is crucial. At this time you will advance your exercise program. Formal physical therapy visits typically will not start until 1-2 weeks after the surgery.

DRIVING

1. Right leg operated on:
    a. No driving for at least 3 weeks after surgery
    b. At 3 weeks you can unlock the brace to drive if:
        i. You have satisfactory ROM
        ii. You can straight-leg raise out of the brace
        iii. You have satisfactory muscle strength
        iv. You are not taking any painkillers

2. Left leg operation on:
    a. Automatic transmission:
        i. No driving for 2 weeks
        ii. At 2 weeks you can drive if you have met the above criteria

Week 2- Week 4: EARLY POST-OPERATIVE PHASE

1. Calf muscle strengthening
    a. Start with bilateral toe raises
    b. Progress to unilateral toe raises

2. Add resistant to exercises
    a. Hip abduction, hip abduction and straight leg raise with 1-5 pound ankle weight

3. Standing ¼ squats
    a. From 0°to 45° knee flexion
    b. Bend slightly forward at the waist
    c. Start with both legs then progress to operated leg alone
    d. Do not do squats beyond 45° as yet

4. Begin stationary cycling
    a. Adjust seat so that the knee is almost straight when the pedal is at its lowest position
    b. Work with low resistance and high speed for endurance and range of motion
    c. Do one legged cycling to work on hamstring strengthening

5. Lateral step-ups
    a. Stand with your feet 4-6 inches apart with the operated leg in front of the non-operated leg. Place the foot of the operated leg until the knee is straight, and then slowly step down. Do 3 sets of 10 set-ups. As strength increases you can increase the height of the step to a maximum of 8 inches.

POOL ACTIVITIES (OPTIONAL)

1. Active ROM of the knee from 0° to 90° with buoyancy assistant extension
2. Flutter kicking performed keep the knee flexed with motion occurring at the hip
3. Walking in chest high water, forwards and backwards
4. Hip exercises; abduction, flexion and extension

Week 4-Week 8: Intermediate Post Operative Period

You will be seen again in the office. Strength, range of motion, and stability will be assessed at this time. If you are making satisfactory progress, the brace will be discontinued, except for those times which may be potentially hazardous (wet or sandy ground, ice or snow, uneven surfaces or long distances where fatigue may be a problem).

AT NO TIME DURING THE REHABILITATION PROGRAM SHOULD ISOKINETIC MACHINES (CYBEX, BIODEX, KIN-COM) BE USED IN THE ISOKINETIC MODE FOR EXERCISES. THE MACHINES MAY BE USED LATER

EXERCISE PROGRAM CONTINUES:

1. Active and active assisted range of motion with goal of approximately 120° of flexion and full extension

2. Hamstring curls:
    a. Begin with ankle weights while standing
    b. Progress to Nautilus or Eagle Cybex leg curl machine

3. Leg press:
    a. Begin using leg press machine with no more than 45° to 60° of knee flexion
    b. Use the leg press machine for toe raises

4. Squats
    a. Continue standing bilateral ¼ squat as tolerated (0° to 60° knee flexion)
    b. Progress to unilateral ¼ squat as tolerated (0° to 60° knee flexion)

5. Multi-angle quadriceps isometric strengthening:
    a. Start at 45° flexion and progress as 15° increments to start to 90° flexion

6. Begin Stairmaster:
    a. Start a 5-minute workout and progress to 20 minutes over a two week interval
    b. Step height between 7-10 inches

AT SIX WEEKS:

1. Begin Nautilus type knee extensions using both legs to lift and the operated leg only to lower the weight (for eccentric quad strengthening)
2. Do quadriceps exercises on the knee extension machine from 90° to 45° flexion only, using the operated leg

DO NOT DO ACTIVE KNEE EXTENSIONS BETWEEN 45 AND 0 WITH OPERATED LEG (puts too much stress son the new ligament)

AT TWELVE WEEKS:

Return to office for a follow-up visit

Depending on your progress you may:

1. Begin light jogging for 10 minutes every other or every third day, increasing your duration by 2- minutes every week as tolerated
2. You may begin agility training if you have received approval of your physician
3. Begin limited non-contact sport specific activities with permission. Discuss your sport preferences with the therapist and your physician

EXERCISE PROGRAM CONTINUES:

1. Range of motion should be close to the normal knee
2. Begin more aggressive strengthening:
    a. Leg press with resistance, but do not exceed 90°of flexion
    b. Increase weights on prone knee curls
    c. Begin knee extension, both concentric and eccentric from 90° flexion to 30° flexion only
    d. Increase resistance and duration on the exercise bike
    e. Increase time on the Stairmaster

LATE POST-OPERATIVE PERIOD (3-6 MONTHS)

Return to office to assess strength, stability and function

If your strength is close to your uninjured leg and you have achieved full range of motion with no swelling and good stability you may progress to an agility program in preparation for return to athletics. Supervision by a therapist or trainer is preferred.

EXERCISE PROGRAM CONTINUES:

1. Maintain full ROM

2. Exercise bike 15-30 minutes to develop local musculature and cardiovascular endurance
    a. Unilateral pedaling for hamstring strengthening

3. Weight machines:
    a. Continue to increase weights. Leg machines should include:
        i. Leg press / half squats from 0° to 90°

ii. Knee curls
iii. Knee extensions from 90° to 0°
iv. Hip abduction
v. Hip abduction

Return to Play Criteria:

1. Strength 90% of uninvolved leg
2. Functional strength 90% of uninvolved leg as measured on Functional Strength Test summary
3. Agility training:
    1. Running forward
    2. Running backward
    3. Side-to-side steps – controlled lateral agility
    4. Side-to-side jumps
    5. Side-to-side hops
    6. Carioca – cross over steps alternating from and back
    7. Figure 8 walk / run
4. Jumping rope:
    1. Start with two feet and progress to one foot

Progress must be gradual and sport specific. Return to full athletics is permitted in certain circumstances between 4 and 6 months. The criteria are:

5. Full ROM
6. Good strength
7. Acceptable stability

AT 6 MONTHS

Return to athletics if the above criteria are met. In addition, you must have:

1. Adequate balance
2. Adequate sport specific agility
3. Adequate strength and endurance

Follow-up may be on a yearly basis for 2-5 years after surgery so that we can assess your progress and evaluate the results of this type of surgery.

If you or your therapist has any questions about your surgery or this rehab protocol, please contact your surgeon.