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## **RECOVERY FROM ACL RECONSTRUCTION**

### **REHABILITATION PROTOCOL**

#### **Follow up Appointment:**

- A follow up appointment should be arranged for you when your surgery was scheduled. Please check your surgery information packet.
- If you do not have an appointment please call the office at 503-661-5388.

#### **Diet:**

- Begin with liquids and light foods such as Jell-O and soups.
- Advance as tolerated to your regular diet if not nauseated.

#### **First 24 Hours:**

- Be in the care of a responsible adult.
- Do not drink alcoholic beverages.

#### **Pain Control:**

- Strong oral narcotic pain medications have been prescribed for you. Use only as directed. No pain medication is capable of taking away all the pain. Taking your pills at regular intervals will give you the best chance of having less pain.
- If you need a refill PLEASE PLAN AHEAD. We recommend 24-48 hours for refills to be approved.
- Do not combine with alcoholic beverages.
- Be careful as you walk or climb stairs as mild dizziness is not unusual.

#### **Wound Care:**

- Maintain your postoperative dressing.
- Remove your surgical bandage on the fourth post op day. Dry the incisions carefully and cover with Band-Aids.
  - If you have a hard cast over the site of your surgery, please keep that on until your post op appointment.
- Keep the incisions clean and dry until your post op appointment. Showers are okay, be sure to avoid direct contact and immersing the incisions in water.
- Your incision may have staples/sutures, they will be removed at your post op appointment 7-10 days following your surgery.
- If there is a problem with bleeding through the dressing, redness, or abnormal drainage please call our office 503-661-5388.

#### **Swelling:**

- Your surgery site may display a moderate amount of swelling. This is to be expected.
- To help control swelling, you may ice the area for 20-30 minutes at a time and continue for at least the first week after surgery.
- The swelling may be present for several days, up to 2-3 weeks postoperatively.
- If you have persistent and/or increasing pain or swelling please call our office at 503-661-5388.

#### **Exercises:**

- Formal Physical Therapy may be prescribed by your doctor at your post operative visit.

**When to call your Surgeon:**

- Significant swelling, calf pain, or any numbness in the limb that was operated on
- Unrelenting pain
- Fever or chills
- Redness around incisions
- Color change in foot or toes
- Continuous drainage or bleeding from wounds (small amount of drainage is expected)
- Any other worrisome condition

**When to call your Primary Care Physician:**

- Flare up of any of your regular medical conditions

**When to call 911:**

- Chest pain
- Shortness of Breath
- Any other acute serious condition

**PREOPERATIVELY:**

If you have suffered a recent injury to your anterior cruciate ligament (ACL) and early surgery is planned, the time between injury and surgery is used to regain motion of the knee and to resolve the swelling in the knee. After seeing your physician, you may be referred to physical therapy to help prepare the knee for surgery. This protocol has been compiled to facilitate your progress to surgery and your recovery from surgery.

**POSTOPERATIVE REHABILITATION FOLLOWING ACL RECONSTRUCTION**

**PATIENT AND PHYSICAL THERAPIST INFORMATION**

**WHILE IN THE HOSPITAL:**

A postoperative brace will be fitted to your leg on the day of surgery. This brace is to be worn full-time until your first postoperative visit, except when doing your exercises.

The day of surgery, you will start getting up and walking, wearing the brace and using crutches. You will be able to put weight on your leg. You will start specific range of motion exercises and some basic strengthening exercises. You should wear the brace when walking.

Before leaving the hospital, you should be walking independently. At home, you should have full knee extension and also be making progress towards knee flexion of 90 degrees.

**FIRST 7-14 DAYS FOLLOWING DISCHARGE FROM HOSPITAL:**

Usually, discharge is within 12-24 hours following surgery. This should be carried out 3-4 times a day, to increase range of motion and strength. You should ice your knee hourly and continue the toning exercises hourly.

You need to continue wearing the brace from walking. You may loosen the straps or remove the brace when sitting, but *always* wear the brace with straps tightened when walking. You should sleep with your brace at night for one month to maintain full extension.

You should continue to use your crutches. Continue to wear the compressive stocking on your leg until you are completely out of the brace (4-6 weeks).

Until the sutures come out, you should not get the wound wet, so cover it with a plastic bag, or else sponge bathe.

To keep your leg elevated at night, place some pillows or a rolled-up blanket at the foot of the bed between your mattress and box spring. This will elevate the foot of your bed, which should help decrease the swelling.

You will be given a prescription for pain medication to take at home. You should try to take as little of this as necessary.

The goals of the first two weeks are:

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

In 7-14 days, you will return to see your doctor to have the sutures removed. At this time, you may also be seen by the therapist to advance your exercise program. Formal physical therapy will usually begin at 4 weeks.

	FROM SURGERY UNTIL 1 <sup>ST</sup> FOLLOWUP APPOINTMENT	FROM 1 <sup>ST</sup> FOLLOWUP APPOINTMENT TO 4 WEEKS	FROM 4-6 WEEKS	AFTER 6 WEEKS
BRACE	Always for walking	May go short distance around home or office without brace	<u>If strength is adequate</u> , may discontinue	Continue for slippery conditions (ice, snow, etc.)
CRUTCHES	Always for walking	Only if you feel the need	Discontinue	Discontinue
COMPRESSIVE STOCKING	Use on operated leg May remove for exercises and icing	Continue to use	Continue to use if swelling persists	Continue to use if swelling persists

**IMMEDIATE POST OPERATIVE PHASE, DAYS 1-7 (diagrams found at end):**

In brace workout, 10 times per *hour*:

- |                    |           |
|--------------------|-----------|
| 1. Ankle pumps     | Diagram 1 |
| 2. Quadriceps sets | Diagram 2 |
| 3. Hamstring sets  | Diagram 3 |

Out of brace workout, 3-4 times per *day*:

- |                               |                           |
|-------------------------------|---------------------------|
| 1. Patella mobilization       |                           |
| a. Superior glides            | Diagram 4                 |
| b. Inferior glides            | Diagram 5                 |
| c. Medial glides              | Diagram 6                 |
| 2. Straight leg raises        | Diagram 7                 |
| 3. Hip abduction              | Diagram 8                 |
| 4. Hip adduction              | Diagram 9                 |
| 5. Hamstring stretching       | Diagram 10                |
| 6. Side-lying range of motion | Demonstrated by therapist |
| 7. Sitting range of motion    | Diagram 12                |

You will return to see the doctor approximately 7-10 days following surgery to have the sutures removed. After suture removal, you are allowed to get your knee wet, and you may bathe. You may give up the crutches, but you *must* use your brace for standing and ambulation. Maintenance of full extension is crucial. Goals by this first visit are straight leg raises with no extension lag, flexion to 90 degrees, extension to 0 degrees, and good patella mobility. Continue to do your exercises 3-4 times per day. Continue to ice your knee at least 3 times per day.

### **EARLY POST OPERATIVE PHASE, DAY 8/28 (diagrams found at end):**

Add the following exercises:

- |   |            |
|---|------------|
| 1. Prone hip extension                  | Diagram 13 |
| 2. Prone leg curls                      | Diagram 14 |
| 3. Heel slides                          | Diagram 15 |
| 4. Prone passive knee extension stretch | Diagram 16 |

### **EARLY POSTOPERATIVE PHASE, WEEKS 2-4:**

Pool activities (if you have access to a pool):

1. Active range of motion from 0-90 degrees with buoyancy assisting extension
2. Flutter kicking performed with knee extended and motion occurring at the hips
3. Walking in chest-deep water forward and backward
4. Hip exercises

### **INTERMEDIATE POSTOPERATIVE PERIOD, WEEKS 4-8:**

You will be seen again by your doctor about 4 weeks after surgery. Strength, range of motion, and stability will be assessed at this time. If progression is appropriate, the brace will be discontinued with the exception of those times which are potentially dangerous (such as wet or sandy ground, ice or snow, uneven surfaces, and long distances where fatigue may be a problem).

Formal physical therapy will be set up at this time. You will bring a copy of this protocol to your therapist. At some time in the next few months, if you have not been fitted for a sports brace, you will be sent to a brace shop for fabrication of your functional knee brace, which will be used for return to athletic activities or any pivoting-type exercises.

### **AT NO TIME DURING THE REHABILITATION PROGRAM SHOULD IDOKINETIC MACHINES (CYBEX, BIODEX, KIN-COM) BE USED FOR REHABILITATION**

### **THE USE OF THESE MACHINES IS POTENTIALLY DAMAGING.**

### **4 WEEKS POST-SURGERY, WITH THE SUPERVISION OF YOUR THERAPIST:**

1. Active and active assisted range of motion with goal of approximately 130 degrees of flexion and full extension.
2. Begin stationary cycling:
  - a. Seat should be adjusted properly so that down leg is in slight flexion.
  - b. You should work low load/high speed for endurance and range of motion.
  - c. Work on one-legged cycling for hamstring activity.
3. Leg press:
  - a. You will progress to leg press machine beginning with 45-60 degrees of flexion.
  - b. Use leg press machine for calf raises.
4. Proprioception board. Begin balancing activities using BAPS board or equivalent.
5. Multi-angle quadriceps isometrics between 90-60 degrees every 15 degrees.
6. Add the following exercises under physical therapy supervision and guidance:

- a. Straight leg raises with ankle weights while maintaining full extension. **NO LAG.**  
Progress with weights at 1-2 lbs. per week, 20 repetitions, 3 times per day.
- b. Hip abduction with ankle weights. Progress with weights at 1-2 lbs. per week, 20 repetitions, 3 times per day.
- c. Standing knee curls with ankle weights. Progress with weights at 1-2 lbs. per week, 20 repetitions, 3 times per day.
- d. Wall slides without weights, 10 repetitions, 3 times per day.
- e. Hip adduction without weights, 20 repetitions, 3 time per day.

**At six weeks add:**

1. Begin Stairmaster as tolerated. Use shallow steps. Start at 5 minutes, adding 2 minutes a session, progressing to 15 minutes.
2. Begin Nautilus-type leg extensions using both legs to lift, and using involved leg to lower (for eccentric quadriceps strength).
3. Do concentric quadriceps 90-45 degrees on leg extension machine, with low weight on the involved leg.

Progress from this point forward depends on the range of motion, stability, and strength of your knee. Those time guidelines are estimated. Your individual progress will be determined by your physician and therapist. There will be a follow up visit with your physician at about 8 weeks from surgery.

**At 8 weeks:**

1. At 8 weeks, you may begin light jogging for 10 minutes every 2<sup>nd</sup> or 3<sup>rd</sup> day, increasing by 2 minutes per week. Monitor knee for signs of swelling.
2. At 10 weeks, you may begin agility training if you have your functional knee brace and approval of your physician. You *must wear* the brace for any cutting, pivoting, or start-stop activities!
3. At 12 weeks, you may begin limited non-contact sport specific activities with specific permission of your physician. Discuss sport activity with your physician and therapist.

**Exercise program continues. Progress through these activities as tolerated:**

1. Range of motion should be full.
2. Begin more aggressive strengthening:
  - a. Leg press: Progress with resistance, but do not exceed 90 degrees of flexion.
  - b. Increased weights on leg curls.
  - c. Begin leg extensions, both concentric and eccentric, for involved side 90-30 degrees.
  - d. Increase intensity and duration on exercise bike.
3. Begin step-ups. Start with 2” step, progress to 6” step. Lower with the heel of the uninvolved leg first. Progress rapidly toward lowering with the involved leg.
4. Agility training. Side-to-side steps.

**LATE POSTOPERATIVE PERIOD, 4-6 MONTHS:**

Return to physician and physical therapist at about 4 months to assess strength, stability, and function.

If strength is adequate and you have full range of motion, no swelling, and good stability by the time of the exam, you may progress with a running and agility program in preparation for return to athletics. Use of a functional knee brace is mandatory for stopping, cutting, or pivoting activities.

**Exercise program continues:**

1. Full range of motion maintained.
2. Exercise bicycle 15-30 minutes to develop local musculature and cardiovascular endurance. Unilateral pedaling for hamstrings.
3. Weight machines. Continue to increase weights. Leg machines should include:
  - a. Leg press/half squat (90 degrees)
  - b. Leg curls
  - c. Leg extensions
  - d. Hip abduction
  - e. Hip adduction
4. Agility training with function knee brace:
  - a. Running forward
  - b. Running backwards
  - c. Side-to-side steps, controlled lateral agility
  - d. Side-to-side steps, emphasize eccentric phase
  - e. Side-to-side hops
  - f. Carioca-crossover steps alternating front and back
5. Jump rope, two feet progressing to one foot. If available, may use mini-tramp/pogo ball.

Progression must be gradual and sports-specific. Return to full athletics is permitted in certain circumstances between 4-6 months with the following requirements:

1. Fully rehabilitated musculature.
2. Functional brace.
3. Acceptable stability.

**At 6 months:**

Return to athletics if the following criteria have been met and if your physician approves:

1. At least 90% strength, work, and endurance
2. Adequate proprioceptive awareness.
3. Adequate sports-specific agility

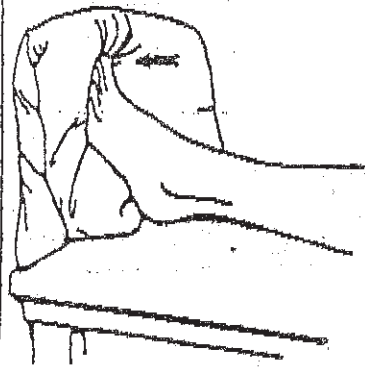
The functional brace should be used to 18 months from the date of surgery.

You may discontinue the brace only with the direct instruction of your physician.

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

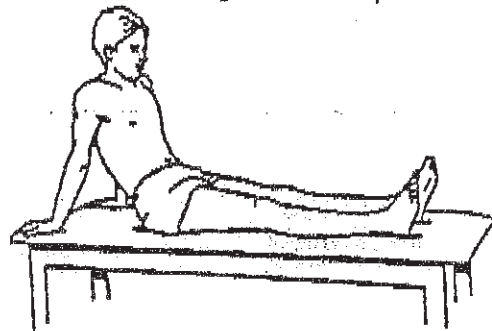
**If you or your therapist has questions about your surgery or this protocol, please call the office at 503-661-5388.**

**ANKLE / FOOT - 1:**  
Isometric Planter Flexion



With rolled pillow against wall, press foot into pillow.  
Hold 5 seconds. Relax. Repeat 10 times.  
Do 10 sessions per day.

**HIP and KNEE - 2:**  
Strengthening: Quadriceps sets



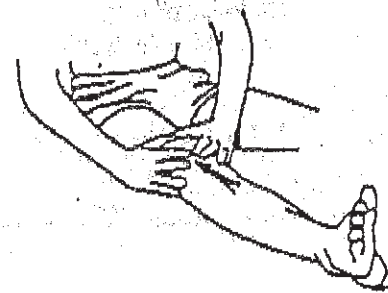
Tighten muscles on top of thigh by pushing knees down into floor or table.  
Hold 10 seconds. Repeat 10 times.  
Do 10 sessions per day.

**HIP and KNEE - 3:**  
Strengthening: Hamstring sets



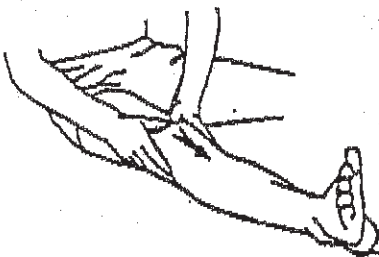
With foot turned inward, tighten muscles on back of thigh by pulling heel down into floor or table.  
Hold 10 seconds. Repeat 10 times.  
Do 10 sessions per day.

**HIP and KNEE - 4:**  
Self-Mobilization  
Upward knee cap pull



With index fingers on lower border of knee cap, gently pull knee cap up toward hip.  
Hold 10 seconds. Repeat 10 times.  
Do 3 sessions per day.

**HIP and KNEE - 5:**  
Self-Mobilization  
Downward knee cap push



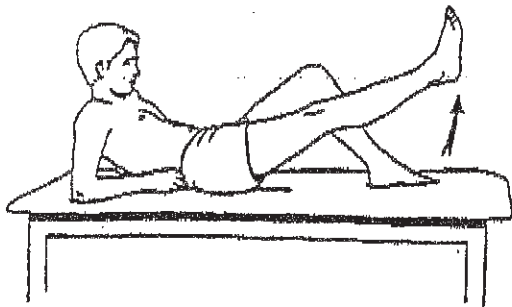
With both thumbs on upper border of knee cap, gently push knee cap toward foot.  
Hold 10 seconds. Repeat 10 times.  
Do 3 sessions per day.

**HIP and KNEE - 6:**  
Self-Mobilization  
Inward knee cap push



Keeping entire length of index finger along outer border of knee cap, gently push knee cap inward toward opposite leg.  
Hold 10 seconds. Repeat 10 times.  
Do 3 sessions per day.

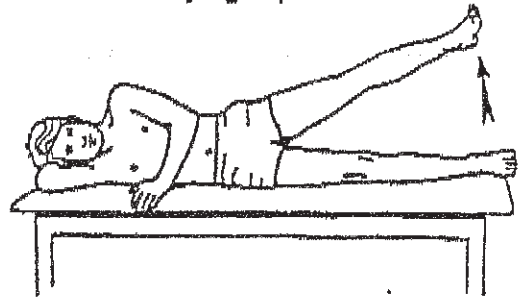
**HIP and KNEE - 7:**  
**Strengthening**  
**Straight Leg Raise, Phase II**



Rest on forearms, tighten muscle on front of thigh, then lift leg 8 - 10 inches from surface, keeping knee locked.

Hold 10 seconds. Repeat 20 times.  
Do 3 sessions per day.

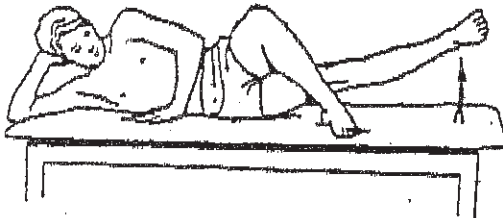
**HIP and KNEE - 8:**  
**Strengthening**  
**Side-lying Hip Abduction**



Lying on side, tighten muscle on front of thigh, then lift leg 8 - 10 inches away from floor.

Hold 5 seconds. Repeat 20 times.  
Do 3 sessions per day.

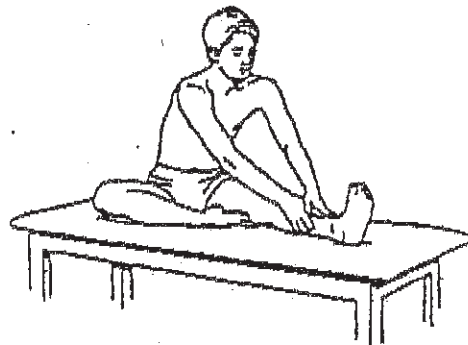
**HIP and KNEE - 9:**  
**Strengthening**  
**Side-Lying Hip Adduction**



Lying on side, tighten muscle on front of thigh, then lift leg 8 - 10 inches away from floor.

Hold 5 seconds. Repeat 20 times.  
Do 3 sessions per day.

**HIP and KNEE - 10:**  
**Stretching: Seated Hamstring Stretch**



Tuck foot near groin with opposite leg straight. Reach down until a stretch is felt in back of thigh.

Hold 10 seconds. Repeat 10 times.  
Do 3 sessions per day.

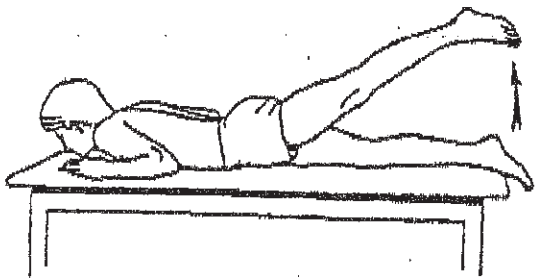
**HIP and KNEE - 12:**  
**Self-Mobilization**  
**Seated knee flexion/extension stretch**

Gently push involved leg back with good leg until you feel a stretch. Hold 10 seconds. Relax. With good leg underneath involved leg, slowly straighten leg out. Repeat 10 times. Do 3 sessions per day.





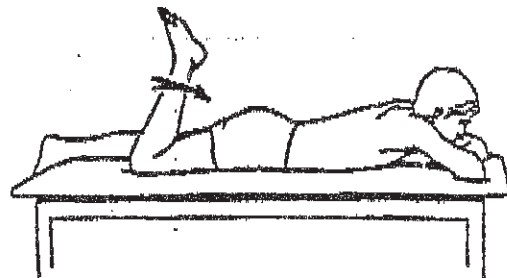
**HIP and KNEE - 13:**  
**Strengthening**  
**Prone Hip Extension**



Lying on stomach, tighten muscle on front of thigh, then lift leg 8 - 10 inches from floor, keeping knee locked.

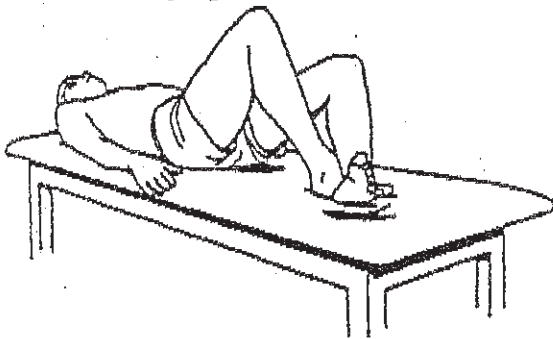
Hold 10 seconds. Repeat 20 times.  
Do 3 sessions per day.

**HIP and KNEE - 14:**  
**Self-Mobilization**  
**Prone knee flexion stretch**



Bring heel toward buttocks as far as possible. Hold 10 seconds. Relax, repeat 20 times. Do 3 sessions per day.

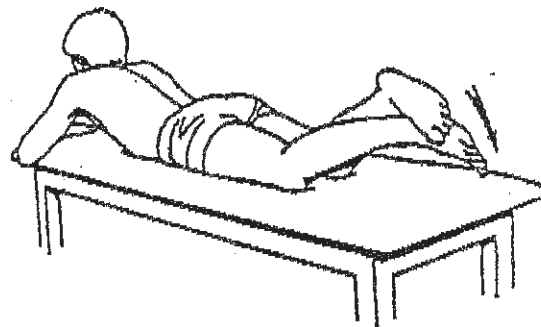
**HIP and KNEE - 15:**  
**Self-Mobilization**  
**Hook-lying knee flexion stretch**



Bend involved knee as far as possible, then using other leg apply a gentle push until a stretch is felt.

Hold 10 seconds. Relax, repeat 10 times.  
Do 3 sessions per day.

**HIP and KNEE - 16:**  
**Self-Mobilization**  
**Prone Knee extension stretch**



Gently push involved leg straight, using other leg, until a stretch is felt.

Hold 10 seconds. Relax and repeat 10 times.  
Do 3 sessions per day.