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ORTHOPAEDIC SPECIALISTS OF NC

## **ANATOMIC ACL RECONSTRUCTION RECOVERY & REHABILITATION PROTOCOL**

- **PREOPERATIVE:**

If you have suffered an acute ACL injury and surgery is planned, the time between injury and surgery should be used to regain knee motion, decrease swelling, and maintain muscle tone. Physical Therapy may be necessary prior to surgery.

- **POSTOPERATIVE:**

Pain Medicine: You will be sent home with a prescription for narcotic pain medicine (oxycodone, hydrocodone, or propoxyphene), Ibuprofen, and Toradol (ketorolac). Narcotic pain medication is usually helpful for the first week. Ibuprofen, an anti-inflammatory, should be used regularly for the first 2-3 weeks. TENS, an electrical device, may also help with your pain control.

Ice: Ice is essential for pain relief and to reduce swelling for the first several weeks after surgery, and can be helpful for several months (particularly after physical therapy sessions). Ice should be used at least 3-4 times a day for 20 minutes.

Activity: You may fully weight-bear on your surgical leg with crutches.

CPM machine (Continuous Passive Motion): A CPM machine may be delivered to your house with instructions on usage. CPM is used for approximately 3 weeks after surgery. It will assist with bending and straightening your knee.

Dressings: You may remove your dressings 48-72 hours after surgery and cover your incisions with band-aids or gauze. Steristrips should

be left in place (strips of white tape covering each incision). You may shower once your incisions are completely dry, without any drainage (usually 5-7 days after surgery).

Braces: A post-operative brace will be fitted to your leg on the day of surgery. The brace should be locked in full extension while you are walking to prevent your knee from giving way or buckling. Otherwise, it may be unlocked to allow knee motion. The brace can be discontinued when your quadriceps strength is adequate, upon recommendation from your surgeon or physical therapist. However, you should continue to use the brace for dangerous activities such as walking on uneven ground, sand, snow, ice, etc. Later, you will be fitted for a functional ACL knee brace, which you will use for jogging, agility training, and return to any athletic or pivoting activities.

Crutches: You will be sent home with crutches to aid your ambulation. Starting the day after surgery, you can put as much weight on your leg as tolerated. You will need the crutches only until you can walk normally without a limp. This varies from person to person. Your surgeon or PT will advise you at your follow up appointments when you can discontinue.

Home Exercises: On the day after surgery you should start performing knee motion exercises as detailed in this protocol. Within 2-3 weeks you should achieve full knee extension and 90 degrees knee flexion.

Goals of the first 2-3 weeks:

1. Knee Motion: full extension to 90 degrees flexion (exercises)
2. Decrease swelling (ice, ibuprofen, elevation)
3. Maintain Quadriceps muscle tone (exercises)

4. Straight Leg Raises without extensor lag
  
5. Good Patella mobility

Physical Therapy: You should start Physical Therapy within 1-2 weeks after surgery. Before that, you will do your exercises at home (as above). Several months of formal Physical Therapy and a devoted home exercise program are essential in order to achieve a good outcome for your knee. Please give a copy of this ACL Rehabilitation Protocol to your therapist.

Follow Up: You will return to see your surgeon at the following intervals after surgery:

1. 7-10 days
  
2. 1 month
  
3. 3 months
  
4. 6 months
  
5. 1 year

• EXERCISES

You should perform your exercises 3-4 TIMES DAILY, starting the day after surgery.

Week 1:

1. Ankle Pumps (see diagram 1)

2. Quad Sets (2)
3. Hamstring Sets (3)
4. Patella Mobilization (4, 5, 6)
5. Hip Abduction (8 -perform in brace locked in extension)
6. Hip Adduction (9 -perform in brace locked in extension)
7. Hamstring Stretching (10)
8. Sitting Range of Motion (12)

Weeks 2-4: Add the following exercises:

1. Straight Leg Raises (7 -perform in brace locked in extension)
2. Prone Hip Extension (13)
3. Prone Leg Curls (14)
4. Heel Slides (15)
5. Prone Passive Knee Extension Stretch (16)

Optional Exercises (if you have access to a pool):

1. Active ROM from 0-90 degrees with buoyancy assisted extension
2. Flutter kicking performed with knee fully extended and motion occurring at the hips
3. Walking in chest deep water forward and backwards
4. Hip Exercises

Weeks 4-8:

1. Active and active-assisted range of motion: 0-130 degrees

2. Leg press
  - a. Begin with 45-60 degrees flexion
  - b. Calf raises
3. Proprioception board
  - a. Balancing exercises
4. Multi-Angle quadriceps isometrics between 90 and 60 degrees, every 15 degrees (6-8 weeks).
5. Add the following under Physical Therapy supervision and guidance:
  - a. Straight Leg Raises with ankle weights (NO EXTENSOR LAG). Progress 1-2 pounds/week, 20
  - b. Hip Abduction with ankle weights. Progress 1-2 pounds/week, 20 repetitions 3 times daily.
  - c. Standing Knee Curls with ankle weights. Progress 1-2 pounds/week, 20 repetitions 3 times daily.
  - d. Wall slides without weights. 10 repetitions, 3 times daily.
  - e. Hip Adduction without weights. 20 repetitions 3 times daily

At 6 weeks, add the following:

1. Stationary Bicycling:
  - a. Adjust seat such that the down leg is in slight flexion
  - b. Low load & high speed for endurance
2. One-legged cycling for hamstring activity

At 8 weeks, add the following:

1. Stairmaster using shallow steps. Start at 5 minutes, adding 2 minutes per session progressing to 15 minutes.
2. Nautilus-type leg extensions using both legs to lift, and surgical leg to lower (eccentric quadriceps strength).
3. Concentric quadriceps 90-45 degrees on leg extension machine with low weight on the surgical leg.

### At 3 months:

1. Light Jogging: 10 minutes every 2<sup>nd</sup> or 3<sup>rd</sup> day, increasing 2 minutes per week. Monitor knee for signs of swelling. If swelling occurs, jogging should be delayed.

### At 4 months:

1. Agility Training

### At 5-6 months:

1. Limited non-contact sport-specific activities with permission from your physician.
2. More aggressive strengthening:
  - a. Leg Press: progress with weights (do not exceed 90 degrees flexion)
  - b. Leg Curls: progress with weights
  - c. Leg Extensions: concentric and eccentric (90-30 degrees)
3. Stationary Bicycle: increase resistance and duration
4. Step-up's: progress from 2 to 6 inch step. Lower with the heel of the uninvolved leg first. Progress rapidly toward lowering with the involved leg.
5. Jump Rope: two feet progressing to one foot
6. Agility Training in functional knee brace:
  - a. Side to side steps: controlled lateral agility, emphasize eccentric phase
  - b. Running forward/backwards
  - c. Side to side hops
  - d. Carioca crossover steps alternating front to back

At 6-8 months: You may return to competitive athletics under the following conditions:

1. No knee swelling
2. Full range of motion
3. Adequate strength: at least 90% strength & endurance
4. Adequate knee stability
5. You must use your functional knee brace. Continue to use your functional knee brace during athletic activity for at least 12 months after surgery. You may discontinue the brace under instruction from your surgeon.