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**New York, NY 10021**

**REHAB PROTOCOL: Anterior and Posterior Cruciate Ligament Reconstruction**

**Name:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Diagnosis:** \_\_\_\_\_

**Date of Surgery:** \_\_\_\_\_

**Phase I (Day 1-13)**

• **Goals:**

- o Restore full passive knee extension
- o Diminish joint swelling and pain
- o Restore patellar mobility
- o Gradually improve knee flexion
- o Re-establish quadriceps control
- o Restore independent ambulation

• **Postoperative Day 1-4**

o **Brace:**

- Drop lock brace locked at 0 degrees extension with compression wrap
- Sleep in brace

o **Weight bearing:**

- Two crutches as tolerated (less than 50%)

o **Range of motion:**

- 0-45/50°

o **Exercises:**

- Ankle pumps
- Quad sets
- Straight leg raising –flexion, abduction, adduction in brace
- Muscle stimulation to quadriceps (4 hours per day) during quad sets & straight leg raises
- Patellar mobilizations 5-6 times daily
- Ice and elevation every 20 minutes of each hour with knee in extension

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○ **Postoperative Day 5-13**

○ Brace:

- Continue use of drop lock brace locked at 0° extension during ambulation & sleep

○ Weight Bearing:

- Two crutches –gradually increase WB to 50% by day 7; 75% by day 12

○ Range of Motion:

- Day 5: 0-65°
- Day 7: 0-70°
- Day 10: 0-75°
- Day 14: 0-90°

○ Exercises:

- Continue previous exercises
- Continue use of muscle stimulation
- Patellar mobilizations 5-6 times daily
- Continue use of ice, elevation, and compression

**Phase II -Maximum Protection (Week 2-6)**

• **Criteria to Enter Phase II:**

- Good quad control (ability to perform good quad set and SLR)
- Full passive knee extension
- PROM 0-90 deg
- Good patellar mobility
- Minimal joint effusion

**Goals:**

- Control deleterious forces to protect grafts
- Nourish articular cartilage
- Decrease swelling
- Decreased fibrosis
- Prevent quad atrophy
- Initiate proprioceptive exercises
- **Week 2**
  - **Brace**
    - Continue use of brace locked at 0 deg of extension
  - **Weight Bearing**
    - As tolerated; approximately 75% body weight
  - **Range of motion**
    - Continue to perform passive ROM 5-6 times daily
    - Day 14: 0-90 deg
  - **Exercises**
    - Continue quad sets & straight leg raises
    - Multi-angle isometrics at 60 deg and 40 deg
    - Patellar mobilizations 5-6 times daily



- Well leg bicycle
- Mini-squats (0-45 deg)
- Continue use of muscle stimulation
- Continue ice, elevation, and compression
- Quadriceps isotonic 90-40 deg
- **Week 3**
  - Continue above mentioned exercises
  - ROM: 0-90 deg
  - Continue use of 2 crutches – 75-80% body weight
- **Week 4**
  - **Brace**
    - Continue use of brace locked at 0 degrees extension
    - Discontinue sleeping in brace
  - **Weight bearing**
    - Progress to weight bearing as tolerated with 1 crutch
  - **Range of Motion**
    - AROM, AAROM, PROM: 0-90/100 deg
  - **Exercises**
    - Weight shifts
    - Mini-squats (0-45deg)
    - Quadriceps isotonic 90-40 deg
    - Light pool exercises and walking
    - Initiate bicycle for ROM & endurance
    - Begin leg press 60-0 deg(light weight)
    - Proprioception/balance drills
- **Week 5-6**
  - Discontinue use of crutches week 5-6
  - Unlock brace for ambulation week 6
  - Initiate lateral lunges
  - Continue pool exercises
  - Range of motion:
    - Week 5: 0-105 deg
    - Week 6: 0-115 deg

### **Phase III -Moderate Protection (week 7-12)**

#### **• Criteria to enter Phase III**

- PROM 0-115°
- Full weight-bearing
- Quadriceps strength > 60% contralateral side (isometric test at 60 degrees)
- Minimal to no full joint effusion
- No joint line or patellofemoral pain

#### **• Goals**

- Control forces during ambulation
- Progress knee range of motion
- Improve lower extremity strength

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- o Enhance proprioception, balance, and neuromuscular control
- o Improve muscular endurance
- o Restore limb confidence and function

- **Brace**

- o Continue use of unlocked brace for ambulation –discharge week 7-8

- **Range of motion**

- o AAROM/PROM: 0-125°

- **Exercises**

- o Continue previous exercises
- o Initiate swimming
- o Initiate lateral and front step-ups (2” step, gradually increase)
- o Progress closed kinetic chain exercises (squats 0-60°, leg press 90-0°)
- o Progress proprioceptive training

### **Phase IV -Controlled Activity (Week 13-16)**

- **Criteria to enter Phase IV:**

- o AROM 0-125°
- o Quadriceps strength > 60-70 contralateral side (isokinetic test)
- o No change in KT scores (+2 or less)
- o No patellofemoral complaints
- o Satisfactory clinical exam

- **Goals**

- o Protect healing grafts
- o Protect patellofemoral joint articular cartilage
- o Normalize lower extremity strength
- o Enhance muscular power and endurance
- o Improve neuromuscular control

- **Exercises**

- o Continue previous exercises
- o Emphasis on eccentric quadriceps strengthening
- o Continue closed kinetic chain mini squats, step-ups, step-downs, lateral lunges and leg presses
- o Hip abduction/adduction
- o Initiate front lunges
- o Calf raises (gastroc and soleus strengthening)
- o Bicycle and stairmaster for endurance
- o Initiate pool running (side shuffle, backward, forward)
- o Initiate walking program
- o Initiate isokinetic exercise 100-40° (120-240°/spectrum)

### **Phase V –Light Activity (Month 4-6)**



- **Criteria to enter Phase IV**

- o AROM > 125°
- o Quadriceps strength 70% of contralateral side; flexion/extension ratio 70-79%
- o Minimal joint effusion
- o Satisfactory clinical exam

- **Goals**

- o Enhancement of strength, power, endurance
- o Initiate functional and/or sport-specific activity
- o Prepare for return to functional activities

- **Exercises**

- o Continue strengthening exercises –emphasize quadriceps & co contraction
- o Initiate plyometric program
- o Initiate running program\*
- o Initiate agility drills
- o Initiate sport-specific training and drills

- **\*Criteria to initiate running program**

- o Acute reconstruction may begin at 4-5 months
- o Chronic reconstruction may begin at 5-6 months
  - Satisfactory clinical exam
  - Unchanged KT Test
  - Satisfactory isokinetic test
  - Quadriceps bilateral comparison (80% or greater)
  - Hamstring bilateral comparison (110% or greater)
  - Quadriceps torque/body weight ratio (55% or greater)
  - Hamstring/quadriceps ratio (70% or greater)
  - Proprioception testing 100% of contralateral side
  - Function hop test >75% of contralateral leg

### **Phase VI –Return to Activity Phase (Month 6-9)**

- **Criteria to return to activities:**

- o Satisfactory clinical exam
- o Unchanged KT test
- o Satisfactory isokinetic test
- o Proprioception testing 100% of contralateral leg
- o Functional hop test > 80% of contralateral leg

- **Goals**

- o Gradual return to full-unrestricted sports
- o Achieve maximal strength and endurance
- o Normalize neuromuscular control
- o Progress skill training

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• **Exercises**

- o Continue strengthening programs
- o Continue proprioception & neuro muscular control drills
- o Continue plyometric program
- o Continue running and agility program
- o Progress sport specific training and drills

**CLINICAL FOLLOW-UPS AT 6, 12, AND 24 MONTHS POSTOPERATIVE**

- o Functional testing
- o Clinical exam

**Comments:**

**Frequency:** \_\_\_\_\_ **times per week**

**Duration:** \_\_\_\_\_ **weeks**

**Signature:** \_\_\_\_\_

**Date:** \_\_\_\_\_