

## **Anterior and Posterior Cruciate Ligament Combined Reconstruction Surgery Rehabilitation Program**

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

- **Goals:**
  - Restore full passive knee extension
  - Diminish joint swelling and pain
  - Restore patellar mobility
  - Gradually improve knee flexion
  - Re-establish quadriceps control
  - Restore independent ambulation
- **Postoperative Day 1-4**
  - Brace
    - Drop lock brace locked at 0 degrees extension with compression wrap
    - Sleep in brace
  - Weight bearing
    - Two crutches as tolerated (less than 50%)
  - Range of motion
    - 0-45/50°
  - 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
- **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
  - 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 90°
  - Good patellar mobility
  - Minimal joint effusion

- Goals:
  - Control deleterious forces to protect grafts
  - Nourish articular cartilage
  - Decrease swelling
  - Decrease fibrosis
  - Prevent quad atrophy
  - Initiate proprioceptive exercises
- **Week 2**
  - Brace
    - Continue use of brace locked at 0° 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°
  - Exercises
    - Continue quad sets & straight leg raises
    - Multi-angle isometrics at 60° and 40°
    - Patellar mobilizations 5-6 times daily
    - Well leg bicycle
    - Mini-squats (0-45°)
    - Continue use of muscle stimulation
    - Continue ice, elevation, and compression
    - Quadriceps isotonic 90-40°
- **Week 3**
  - Continue above mentioned exercises
  - ROM 0-90°
  - Continue use of 2 crutches – 75-80% body weight
- **Week 4**
  - Brace
    - Continue use of brace locked at 0° extension
    - Discontinue sleeping brace
  - Weight Bearing
    - Progress weight bearing as tolerated with 1 crutch
  - Range of motion
    - AROM,AAROM, PROM: 0-90/100°
  - Exercises
    - Weight shifts
    - Mini-squats (0-45°)
    - Quadriceps isotonic 90-40°
    - Light pool exercises and walking
    - Initiate bicycle for ROM & endurance
    - Begin leg press 60-0° (light weight)
    - Proprioception/balance drills
- **Week 5-6**
  - Discontinue use of crutches week 5-6

- Unlock brace for ambulation week 6
- Fit for functional ACL/PCL brace
- Range of motion
  - Week 5: 0-105°
  - Week 6: 0-115°
- Continue pool exercises
- Initiate lateral lunges

### **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
  - Enhance proprioception, balance, and neuromuscular control
  - Improve muscular endurance
  - Restore limb confidence and function
- **Brace**
  - Continue use of unlocked brace for ambulation – discharge week 7-8
- **Range of motion**
  - AROM/PROM: 0-125°
- **Exercises**
  - Continue previous exercises
  - Initiate swimming
  - Initiate lateral and front step-ups (2" step, gradually increase)
  - Progress closed kinetic chain exercises (squats 0-60°, leg press 90-0°)
  - Progress proprioceptive training

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

- **Criteria to Enter Phase IV:**
  - AROM 0-125°
  - Quadriceps strength > 60-70 contralateral side (isokinetic test)
  - No change in KT scores (+2 or less)
  - No patellofemoral complaints
  - Satisfactory clinical exam
- **Goals**
  - Protect healing grafts
  - Protect patellofemoral joint articular cartilage
  - Normalize lower extremity strength
  - Enhance muscular power and endurance
  - Improve neuromuscular control

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

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

- **Criteria to Enter Phase V**
  - AROM > 125
  - Quadriceps strength 70% of contralateral side; flexion/extension ratio 70-79%
  - Minimal joint effusion
  - Satisfactory clinical exam
- Goals
  - Enhancement of strength, power, endurance
  - Initiate functional and/or sport-specific activity
  - Prepare for return to functional activities
- Exercises
  - Continue strengthening exercises – emphasize quadriceps & co-contraction
  - Initiate plyometric program
  - Initiate running program\*
  - Initiate agility drills
  - Initiate sport-specific training and drills
- **\*Criteria to initiate running program**
  - Acute reconstruction may begin at 4-5 months
  - 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:**
  - Satisfactory clinical exam
  - Unchanged KT test
  - Satisfactory isokinetic test

- Proprioception testing 100% of contralateral leg
- Functional hop test >80% of contralateral leg
- Goals
  - Gradual return to full-unrestricted sports
  - Achieve maximal strength and endurance
  - Normalize neuromuscular control
  - Progress skill training
- Exercises
  - Continue strengthening programs
  - Continue proprioception & neuromuscular control drills
  - Continue plyometric program
  - Continue running and agility program
  - Progress sport-specific training and drills

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

- Functional testing
- Clinical exam