



## Postoperative Rehabilitation Protocol for Carticel Implantation for Trochlea/ Patella

### **GENERAL GUIDELINES**

- Program is designed to protect the Carticel Implantation, minimize stress on the grafted area, preserve joint motion, and rehabilitate the extremities

### **GENERAL PROGRESSION OF ACTIVITIES OF DAILY LIVING**

Patients may begin the following activities at the dates indicated (unless otherwise specified by the physician):

- Showering – once dressing removed; no immersion until stitches/staples removed and wounds healed, if brace is present may remove for shower.
- Driving: when safely able to operate the controls of the vehicle. Any time for left knee surgery (assuming automatic transmission), and longer for right leg surgery.
- Return to work/school will depend on the individual needs

### **PHYSICAL THERAPY ATTENDANCE**

The following is an approximate schedule for supervised physical therapy visits:

- Aquatic exercises if available for first month
- Formal PT begins after patient is able to begin to bear weight usually 4-6 weeks
- 3 times per week is optimal
- Home exercises daily as instructed by the therapist
- Supervised physical therapy takes place for approximately 3-5 months post-op

### **PHASE I: Protection Phase:**

Begins immediately following surgery and lasts approximately six weeks. Patient is to protect the healing tissue from load and shear forces. Brace locked at 0° during weight-bearing activities. Sleep in the locked brace for 2-4 weeks. Extended standing should be avoided.

### **Goals:**

- Protect healing bony and soft tissue structures
- Decrease pain and effusion
- Gradually improve knee flexion
- Restore full passive knee extension
- Regain quadriceps control

### **Weight bearing Status:**

- Immediate partial weight bearing in full extension as tolerated
  - 25% body weight with brace locked
  - 50% body weight by week 2 in brace
  - 75% body weight by weeks 3-4 in brace

**\*\*If combined with tibial tubercle transfer, then non-weight bearing for 6 weeks\*\***

## **Therapeutic Exercises:**

### ROM:

- Immediate motion exercises days 1-2
- Gain full passive knee extension ASAP
- 1-3 weeks: Initiate Continuous Passive Motion (CPM) day 1: 8-12 hours/day
  - Progress 5° -10° /day
  - May continue CPM 6-8 hours/day for up to 6 weeks
- Motion guidelines for CPM
  - 2-3 weeks: Knee flexion 90°
  - 3-4 weeks: Knee flexion 105°
  - 5-6 weeks: Knee flexion 120°
- Guidelines if tibial tubercle transplant
  - 0-2 weeks: 0°
  - 2-4 weeks: 0-30°
  - 4-6 weeks: 30-60°
  - 6-8 weeks: 60-90°
- Stretch hamstrings and calf daily
- Begin patellar mobilization and soft tissue mobilization

### Strengthening:

- Ankle pumps using rubber tubing
- Quad sets and Straight Leg Raises
- Isometrics of the quad and hamstrings
- Straight leg raises
- Toe and Calf Raises
- 4 weeks: Begin GAIT training in pool

## **Swelling Control:**

- Ice, elevation and compression

## **Criteria to Progress**

- Full passive knee extension
- Knee flexion to 120°
- Minimal pain and swelling
- Good quadriceps control

## **PHASE II: Transition Phase:**

Begins 6 weeks post-op, and extends to the 12<sup>th</sup> post-op week. Discontinue post-operative brace at 6<sup>th</sup> week.

## **Goals:**

- Gradually increase ROM
- Gradually improve quadriceps strength and endurance
- Gradual increase to functional activities

## **Weight-bearing Status:**

- Progress weight-bearing as tolerated
- 6-8 weeks: Progress to full weight-bearing
- 6-8 weeks: Discontinue crutches

### **Therapeutic Exercises:**

ROM:

- Gradually increase ROM
  - Knee flexion to 120° -125° by week 8
  - Maintain full extension
- Continue patellar mobilization and soft tissue mobilization
- Continue stretching program

Strengthening:

- Progress to mini-squats (0° -45°) when able to be full weight bearing
- May continue hip flexion/extension/Abduction/Adduction
- Open kinetic chain OK
- Closed kinetic chain for knee extension utilizing resisted band while standing.
- Stationary bike and/or elliptical machines can be used for cardio and leg conditioning; low resistance and gradually increase time
- Balance and Proprioception activities (e.g. single leg stance or mini-trampoline)
- Initiate front and lateral step-ups
- Continue toe and calf raises
- Continue use of pool for GAIT training and exercise

### **Functional Activities:**

As pain and decrease, the patient may gradually increase functional activities. The patient may also begin gradually increasing standing and walking.

### **Criteria to Progress:**

- Full ROM
- Acceptable Strength
  - Hamstrings within 10-20% of other leg
  - Quadriceps within 20-30% of other leg
- Balance testing within 30% of other leg
- Patient is able to walk 1-2 miles or bike 30 minutes

### **PHASE III: Maturation Phase:**

Begins approximately 13 weeks post-op, and extends to 32 weeks post-op.

### **Goals:**

- Improve functional strength and proprioception utilizing closed and/or open kinetic chain exercises
- Increase functional activities

### **Therapeutic Exercises:**

ROM:

- Patient should maintain 125° -135° flexion

Strengthening:

- Continue lower extremity exercise progression with emphasis on quads tone and strength
- Bilateral squats (0° -60°)
- Treadmill progressive walking program as tolerated
- Stairmaster/elliptical trainer, swimming is OK

**Functional Activities:**

As patient improves, increase walking (distance, cadence, incline, etc). Light running can be initiated toward end of phase per physician.

**Criteria to Progress:**

- Full non-painful ROM
- Strength within 80-90% of other leg
- Balance and stability within 75% of other leg
- Rehabilitation and functional activities do not cause pain, inflammation and swelling

**PHASE IV: Functional Activities Phase:**

Return to sport at approximately 8 to 15 months

**Goals:**

- Safe and gradual return to work or athletic participation
- This may involve sports specific training, work hardening or job restrictions as needed
- Maintenance of strength, endurance and function
- Running progression
- Figure 8 progression, Carioca, Backward running, cutting
- NO Jumping (plyometrics) until 12 months and then gradual progression if needed for sport (i.e., volleyball or basketball)
- Continue maintenance 3-4 times/week

\*\*\*These instructions are to be used as general guidelines. Before 3 months it is important not to go any faster even if the patient seems able, since the most important consideration is graft protection. Please have physician contacted if there are questions or concerns

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