

**CARTICEL IMPLANTATION
FEMORAL CONDYLE REHABILITATION PROTOCOL
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PHASE I - PROTECTION PHASE (WEEK 0-6)

Brace:

Locked at 0 degrees during weight bearing (NWB x 2wks)
Sleep in locked brace for 2-4 weeks
Unlock brace for motion exercises only, during first 2 weeks

Weight Bearing:

NWB x 2 weeks.
Toe Touch Weight Bearing (approx 20-30lbs) at 3 weeks
PWB (approx 1/4 body weight) at weeks 4 - 5

Range of Motion:

Begin 24hr post-op
Full passive knee extension immediately
Initiate CPM day 24 - 48 hours post-op, for total of 8-12 hours/day.
CPM set at 0-40 degrees flexion for 2-3 weeks
Progress CPM as tolerated 5 - 10 degrees per day
May continue CPM 6-8 hours/day for up to 6 weeks
Patellar mobilizations (4-6 times per day)
Passive Knee flexion ROM 2-3x/day
Knee flexion ROM goals

Week 1-2	90 degrees
Week 3-4	105 degrees
Week 5-6	120 degrees

Stretch Hamstring and calf

Strengthening Program:

Ankle pump with theraband
Quad Set
Multi-angle isometrics co-contractions for quad and hamstring
Active knee ext 90 - 40 degrees without resistance
Straight leg raise x4
Stationary bike when ROM allows
Biofeedback and e-stim as needed
Isometric leg press by week 4 (multi angle)
May begin pool program for gait training and exercise after week 4

Precautions:

Reduce activities if pain or inflammation occurs

Gradual return to daily activities
Extended standing should be avoided
Utilize ice, compression and elevation at home to decrease swelling

Criteria to Progress to Phase II:

Full passive and active knee extension
Minimal pain and swelling
Knee flexion to 120 degrees
Voluntary quadriceps activity

PHASE II - TRANSITION PHASE (WEEKS 6-12)

Brace:

Discontinue post-operative brace at week 6 unless specified otherwise by the surgeon

Weight-Bearing:

Progress weight bearing as tolerated
Progress to FWB and discontinue crutches by 8-9 weeks

Range of Motion:

Gradual increase ROM
Progress knee flexion to 125 - 135 degrees
Continue patellar mobs and stretching as needed

Strengthening Exercises:

Initiate weight shifts at week 6
Initiate mini-squats 0 - 45 degrees
Closed kinetic chain leg press
Heel Raises
Open kinetic chain knee extension progress 1lb/week (0 - 45 degrees)
Stationary bike with low resistance
Treadmill walking
Balance and proprioception drills
Forward and lateral step ups

Precautions:

Gradually increase standing and walking time as pain and swelling diminish

Criteria to Progress to Phase III:

Full ROM
Strength Hamstring within 10% - 20% of contralateral leg
Quadriceps within 20% - 30% of contralateral leg
Balance testing within 30% of contralateral leg for single leg stance
Able to walk 1-2 miles or bike for 30 minutes

PHASE III: MATURATION PHASE (WEEK 12-26)

Range of Motion:

Should have 125 - 135 degrees flexion

Exercise Program:

Leg press (0 - 90 degrees, unless patellofemoral pain, then 0 - 45 degrees)
Squats (0 - 60 degrees)
Step-ups progressing from 2" - 8"
Forward lunge
Walking program
Open kinetic chain knee extension with ankle weight (0 - 90 degrees, unless patellofemoral pain,
then 0 - 45 degrees)
Bicycle
Stair machine, Elliptical machine, ski machine
Swimming

PHASE III CONTINUED

Maintenance Program:

- Initiate by weeks 16 - 20
- Bicycle with low resistance, increase time
- Progressive walking
- Pool exercise for entire lower extremity
- Straight leg raises
- Leg Press
- Heel Raises
- Wall Squats
- Hip abd/add
- Forward lunges
- Step-ups
- Stretching quadriceps and hamstrings

Criteria to Progress to Phase IV:

- Full non-painful ROM
- Strength within 80% - 90 % of contra lateral extremity
- Balance and/or stability within 75% of contra lateral extremity in single leg stance.
- Minimal to no pain, inflammation or swelling from exercises or functional activities

PHASE IV - FUNCTIONAL ACTIVITIES PHASE (WEEK 26-52)

Exercises:

- Continue Maintenance program 3-4x/wk
- Progress resistance as tolerated
- Emphasis on lower extremity strength and flexibility
- Progress agility and balance drills
- Impact loading program should be specialized to the patient's demands
- Progress sport programs depending on patient variables

Functional Activities:

- Patient may return to various sport activities as progression in rehabilitation and cartilage healing allows.
- Generally, low-impact sports such as swimming, skating, in-line skating, and cycling are permitted at about 6 months
- Higher impact sports such as jogging, running, and aerobics may be performed at 8 - 9 months for small lesions or 9 - 12 months for larger lesions.
- High impact sports such as tennis, basketball, football, and baseball may be allowed at 12 - 18 mo.
- ** If, at any time, pain or swelling develops, these high impact activities my be discontinued and the surgeon should be notified.**

Physician Signature