

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

**Brace:**

Locked at 0 degrees during ambulation and weight bearing activities  
Sleep in locked brace for 4 weeks

**Weight Bearing:**

Immediate partial weight bearing in full extension, as tolerated  
Toe Touch Weight Bearing (approx 20-30lbs) at 3 weeks  
25% weight bearing with brace locked  
50% body weight by week 2 in brace  
75% body weight by weeks 3 - 4 in brace

**Range of Motion:**

Immediate motion exercise day 2  
Full passive knee extension immediately  
Initiate CPM on day 2, 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 2-3	90 degrees
Week 3-4	105 degrees
Week 5-6	120 degrees

Stretch Hamstring and calf

**Strengthening Program:**

Ankle pump with theraband  
Quad Set  
Toe - calf raises by week 2  
Straight leg raise x4  
Stationary bike when ROM allows  
Biofeedback and e-stim as needed  
Isometric leg press by week 4 (multi angle)  
Initiate weight shifts by week 4  
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  
Use caution with stair climbing  
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 115-120 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 6-8 weeks

**Range of Motion:**

Maintain full passive knee extension  
Gradual increase ROM  
Progress knee flexion to 120-125 degrees by week 8  
Continue patellar mobs and stretching as needed

**Strengthening Exercises:**

Initiate mini-squats 0 - 45 degrees by week 8  
Closed kinetic chain leg press, 0-60 degrees by week 8  
Heel Raises  
Open kinetic chain knee extension without resistance  
Begin knee extension 0-30 degrees then progress to deeper angle (max 0-60 degrees)  
Stationary bike with low resistance (gradually increase time)  
Stair machine at week 12  
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: REMODERLING PHASE (WEEK 13 - 32\_**

**Range of Motion:**

Should have 125 - 135 degrees flexion

**Exercise Program:**

Leg press ( 0 - 60 degrees; progress to 0-90 degrees if no pain)  
Squats (0 - 60 degrees)  
Step-ups progressing from 2" - 6"  
Forward lunge  
Walking program on treadmill  
Open kinetic chain knee extension ( 90-40 degrees) - progress 1 lb. every 10 - 14 days if no pain or crepitus - must monitor symptoms  
Bicycle  
Stair machine, Elliptical machine, ski machine  
Swimming

**PHASE III CONTINUED**

**Functional Activities:**

As patients improves, you may increase walking (distance, cadence, incline, etc)  
Light running can be initiated toward end of phase based on physician evaluation

**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 ( 0-45 degrees)  
Hip abd/add  
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 - MATURATION PHASE ( 8 - 15 MONTHS )**

**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  
No jumping or plyometric exercises until 12 months  
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, patient develops extensive crepitus, pain or swelling, must stop these high level activities and inform surgeon**

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Physician Signature