

Palmetto Health USC

ORTHOPEDIC CENTER

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REHABILITATION FOLLOWING AUTOLOGOUS CHONDROCYTE IMPLANTATION (CARTICEL)

I. EARLY PHASE (DAY 1 TO WEEK 12)

Goals

1. Range of Motion
 2. Patellar mobility
 3. Active muscular recruitment
 4. Gradual weight-bearing on implantation site
- A. Weight Bearing
1. Partial weight bearing of up to 25% body weight **in brace only**
 2. Brace locked at 0° extension
 3. Use at least one crutch until 8th week post-op if there is any joint pain or swelling associated with walking
 4. Use brace until quad is strong enough to control leg in SLR with no extension lag
 5. Advance to full weight-bearing by 12th week
- B. Range of Motion
1. CPM starting at 0-45°, increasing 5-10° per day as pain/swelling allows
 2. Use CPM 8-10 hours/day for 1st 2 weeks
 3. Goal is 90° by 4 weeks, 110° by 5 weeks post-op
 4. AAROM moving the leg in a supported fashion (eg. bicycle) to gain flexion
 5. Well leg exercises and stretches
- C. Exercises
1. Quad sets
 2. EMS for quad recruitment
 3. Biofeedback for neuromuscular re-education
 4. Early focus on isometrics
 5. Start AROM exercises in ranges that do not load or irritate repair site
 6. SLR without extension lag by 3-4 weeks post-op
 7. Bicycle once 90° ROM is obtained (light resistance)
 8. Affected leg hip and ankle exercises
 9. Closed chain leg presses (only if pain free)

II. TRANSITION PHASE (WEEKS 13 THROUGH 6 MONTHS)

- A. Weight Bearing
 1. FWB by Week 12
 2. Initiate treadmill for slow speed gait training
- B. Range of Motion
 1. Work towards full ROM
 2. Patellar mobs, soft tissue mobs
 3. Continue stretching hams, calves, quads, hip
- C. Exercises
 1. Continue multi-angle isometrics
 2. Bilateral coordinated exercises
 3. Standing squat isometric holds
 4. Keep load/weight applied less than patient's body weight
 5. Single leg press work may advance to dynamic repetitions if pain free
 6. Bicycle at normal settings
 7. Stairmaster, Versaclimber – start with short arcs of motion
 8. Rower – start with short arcs of motion
 9. Treadmill for walking – slight incline (2-3%) to reduce joint loads
 10. Proprioception exercises
 11. Progress resistive exercises of hamstrings, calves, etc..

III. MID-PHASE (7TH MONTH-9TH MONTH)

- A. Range of Motion
 1. Maintain full AROM/PROM, patellar mobility, soft tissue mobility
 2. Symmetrical use of both lower extremities in all activities
 3. Good biomechanics and form
- B. Exercises
 1. Treadmill on an incline – progress to faster speeds without running
 2. Increase work loads to knees in sagittal plane of motion
 3. Advanced gym and non-gym workouts and rehabilitation
 4. Varied press activities, squat positions
 5. Increased cardiovascular activities
 6. Combination cross-training – cycle, stairmaster, treadmill (fast walk)

IV. FINAL PHASE (MONTH 10 THRU MONTH 18)

- A. Exercises
 1. Initiate impact training
 2. Initiate fast walk/light jog on treadmill using slight incline to help reduce impact load; start with 2 min. walk, 2 min. jog
 3. Advanced training with heavier weights and fewer reps
 4. Emphasize single leg loading and loading in full weight bearing

5. Initiate plyometric activities (jumping, hopping, landing, shuttle bounding, absorption activities)
6. Side steps, hops, with and without resistive cording
7. Sport specific drills, mock sport activities in a controlled setting

Timeline Graphs for Activities

Low Impact Activities: 9-12 months

Skating, Rollerblading, Cross Country Skiing, Cycling

Repetitive Impact Activities: 13-15 months

Jogging, Running, Aerobic Classes

High Level Activities: 16-18 months

Tennis, Basketball