



DOSHER Physical Therapy



Autologus Chondrocyte Implantation (ACI)

PHASE I: PROTECTIVE PHASE (weeks 0-6)

GOALS:

- Protect healing tissue from load and shear forces
- Restoration of full passive knee extension
- Gradual improvement of knee flexion
- Regaining quadriceps control

BRACE:

- Locked at 0° during weight-bearing activities
- Sleep in locked brace for 2-4 weeks

❖ WEIGHT BEARING:

- Nonweight bearing for 2 weeks. Progress to toe touch weight bearing at 4 weeks.
- Toe touch weight bearing at week 5.

❖ Range of Motion:

- Immediate motion exercises
- CPM after 4-12 hours (0-40°), 4-12 hours per day for 2-3 weeks
- Progress CPM as tolerated 5-10° per day
- Passive knee flexion ROM 2-3 X's daily
- Knee flexion ROM goal is 90° by 2 weeks
- Knee flexion ROM goal is 105° by 4 weeks and 120° by 6 weeks
- Stretch hamstrings, calf, and quadriceps
- Patellar mobilization

❖ **Stretching Program:**

- Ankle pump using rubber tubing
- Multiangle isometrics (co-contraction quads and hamstrings)
- Active knee extension 90°-40° (no resistance)
- Straight leg raises (four directions)
- Stationary bike when ROM allows
- Isometric leg press at week 4 (multiangle)

❖ **Functional Activities:**

- Gradual return to daily activities
- If symptoms occur, pt should reduce activities to reduce pain and inflammation

PHASE II: TRANSITION PHASE (weeks 6-12)

GOALS:

Gradually increase ROM

Gradual improvement in quad strength and endurance

Gradual increase in functional activities

❖ **Criteria to Progress to Phase II**

1. Full passive knee extension
2. Knee flexion to 115° - 120°
3. Minimal pain and swelling

❖ **Brace:**

- Discontinue brace at 4-6 weeks

❖ **Weight bearing:**

- Progress weight bearing as tolerated
- Half of body weight with crutches at 6 weeks
- Progress to full weight bearing 8-9 weeks
- Discontinue crutches at 8-9 weeks

❖ **Range of Motion:**

- Gradual increase in ROM
- Maintain full passive knee extension
- Progress knee flexion to 120°-125°
- Continue stretching program

❖ **Strengthening Exercises:**

- Initiate mini squats 0-45°
- Toe-calf raises
- Stationary bike
- Treadmill walking program
- Balance and proprioception drills
- Initiate front and lateral step-ups

PHASE III: MATURATION PHASE (weeks 12-26)

❖ CRITERIA TO PROGRESS TO PHASE III

1. Full range of motion
2. Acceptable strength level
 - a. Hamstring within 10% of contralateral leg
 - b. Quadriceps within 10-20% of contralateral leg
3. Able to walk 2 miles or bike for 30 minutes
4. 50 lateral step-ups (8 inch height)

❖ RANGE OF MOTION:

- Pt should exhibit 125°-135°

❖ EXERCISE PROGRAM:

- Leg press (0°-60°)
- Bilateral squats (0°-60°)
- Forward lunges
- Walking program
- Bicycle
- StairMaster
- Swimming
- Nordic Track

PHASE IV: FUNCTIONAL ACTIVITIES PHASE (Weeks 26-52)

GOALS: Gradual return to full unrestricted functional activities.

CRITERIA TO PROGRESS TO PHASE IV

1. Full nonpainful ROM
2. Strength within 90% of contralateral extremity
3. No pain, inflammation, or swelling

❖ FUNCTIONAL ACTIVITIES:

- Patient may return to various sports activities as his/her progression in rehab allows.
- Generally, low impact sports such as skating, rollerblading, and cycling are permitted at about 6 months. Higher impact sports such as jogging, running, and aerobics may be performed at 8-9 months. High impact sports such as tennis, basketball, and baseball are allowed at 12 months.