

## Autologous Chondrocyte Implantation (ACI) (Femoral Condyle)

### PHASE I (Weeks 0-12)

- **Weight Bearing:**
  - Weeks 0-2: Non-weightbearing
  - Weeks 2-4: Partial weightbearing (30-40 lbs)
  - Weeks 4-6: Continue with partial weightbearing (progress to use of one crutch at weeks 6-8)
  - Weeks 6-12: Progress to full weightbearing with discontinuation of crutch use
- **Bracing:**
  - Weeks 0-2: Hinged knee brace locked in extension – remove for CPM and rehab with PT
  - Weeks 2-4: Gradually open brace at 20° intervals as quad control is obtained
  - D/C brace when patient can perform straight leg raise without extension lag
- **Range of Motion** – Continuous Passive Motion (CPM) Machine for 6-8 hours per day for 6 weeks
  - Set CPM to 1 cycle per minute – set initially at 0-30°
  - Increase flexion 5-10° per day until full flexion is achieved
    - Should be at 90° by week 4 and 120° by week 6
  - PROM/AAROM and stretching under guidance of PT
- **Therapeutic Exercises:**
  - Weeks 0-2: Straight leg raise/quad sets, Hamstring isometrics
    - Perform exercises in the brace if quad control is inadequate
  - Weeks 2-6: Begin progressive isometric closed chain exercises\*\* (**see comments**)
    - At week 6 can start weight shifting activities with operative leg in extension
  - Weeks 6-10: Progress bilateral closed chain strengthening, begin open chain knee strengthening
  - Weeks 10-12: Begin closed chain exercises using resistance (less than patient's body weight), progress to unilateral closed chain exercises
  - At week 10 can begin balance exercises and stationary bike with light resistance

### PHASE II (Weeks 12-24)

- **Weight Bearing:** Full weightbearing with normal gait pattern
- **Range of Motion:** Advance to full/painless ROM
- **Therapeutic Exercises:**
  - Advance bilateral and unilateral closed chain exercises
    - Emphasis on concentric/eccentric control
  - Stationary Bike/treadmill/Stairmaster/Elliptical
  - Progress balance/proprioception exercises
  - Start sport cord lateral drills

**PHASE III (Months 6-9)**

- **Weight Bearing:** Full weightbearing with normal gait pattern
- **Range of Motion** -- Full/painless ROM
- **Therapeutic Exercises:**
  - Advance strength training
  - Start light plyometric exercises
  - Start jogging and sport-specific training at 6 months

**PHASE IV (Months 9-18)**

- **Weight Bearing:** Full weightbearing with normal gait pattern
- **Range of Motion** – Full/ painless ROM
- **Therapeutic Exercises:**
  - Continue closed chain strengthening exercises and proprioception activities
    - Emphasize single leg loading
  - Sport-specific rehabilitation – running/agility training at 9 months
  - Return to impact athletics – 16 months (if pain free)
- Maintenance program for strength and endurance

**\*\*Weeks 2-6 – need to respect the repair site: if anterior lesion avoid loading in full extension, if posterior lesion avoid loading in flexion > 45° \*\***