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## Rehabilitation Protocol: Autologous Chondrocyte Implantation (ACI)/DeNovo NT Implantation (Femoral Condyle)

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Diagnosis: \_\_\_\_\_

Date of Surgery: \_\_\_\_\_

### Phase I (Weeks 0-12)

- **Weightbearing:**
  - Weeks 0-2: Non-weightbearing
  - Weeks 3-4: 25% body weight
  - Weeks 5-6: 50% body weight
  - Weeks 7-8: 75% body weight (can use single crutch)
  - Weeks 8-12: 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 an 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)**
  - **Weightbearing:** Full weightbearing with a 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)**
  - **Weightbearing:** Full weightbearing with a normal gait pattern
  - **Range of Motion** – Advance to 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)**
  - **Weightbearing:** Full weightbearing with a 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

**Comments:**

**\*\*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°\*\***

**Frequency: \_\_3\_\_ times per week**

**Duration: \_\_8\_\_ weeks**

***Send Progress notes***

**Physician's Signature:** \_\_\_\_\_

(I have medically prescribed the above treatments)

**Michael S. Day, MD**