

Rehabilitation Protocol: Autologous Chondrocyte Implantation (ACI)/DeNovo NT/Biocartilage Implantation (Trochlea/Patella)

Phase I (Weeks 0-12)

- **Weightbearing:**
 - Weeks 0-2: Non-weightbearing
 - Weeks 2-4: Partial weightbearing (30-40 lbs)
 - Weeks 4-8: Continue with partial weightbearing (progress to use of one crutch at weeks 6-8)
 - 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: Locked in extension for weight bearing – Can open brace for NWB ROM 0-30°
 - Weeks 4-6: Open brace to 30° for ambulation
 - D/C brace at 6 weeks post-op
- **Range of Motion** – Continuous Passive Motion (CPM) Machine for 6-8 hours per day for 8 weeks
 - Set CPM to 1 cycle per minute – set at 0-30° for first 3 weeks
 - Starting at week 3 increase flexion 5-10° per day until full flexion is achieved
 - Should be at 90° by week 6 and 120° by week 8
 - PROM/AAROM and stretching under guidance of PT
- **Therapeutic Exercises**
 - Weeks 0-4: Straight leg raise/Quad sets, Hamstring isometrics
 - Perform exercises in the brace if quad control is inadequate
 - Weeks 4-10: Begin isometric closed chain exercises
 - At week 6 can start weight shifting activities with operative leg in extension
 - At week 8 can begin balance exercises and stationary bike with light resistance
 - Weeks 10-12: hamstring strengthening, theraband resistance exercises 0-30°, light open-chain knee isometrics

Phase II (Weeks 12-24)

- **Weightbearing:** Full weightbearing with a normal gait pattern
- **Range of Motion** – Advance to full/painless ROM
- **Therapeutic Exercises**
 - Gait training/treadmill use at slow-moderate pace
 - 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 closed chain strengthening/Start unilateral closed chain exercises
 - Progress to fast walking and backward walking on treadmill (add incline at 8 months)
 - Start light plyometric training

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 – jogging/agility training at 9 months
 - Return to impact athletics – 16 months (if pain free)
- Maintenance program for strength and endurance