

Rehabilitation Protocol: Autologous Chondrocyte Implantation (ACI)/DeNovo  
NT Implantation (Trochlea/Patella)  
Dr Shane Hanzlik

**Phase I (Weeks 0-12)**

**Weight bearing:**

- Weeks 0-2: Non-weight bearing
- Weeks 2-4: Partial weight bearing (30-40 lbs)
- Weeks 4-8: Continue with partial weight bearing (progress to use of one crutch at weeks 6-8)
- Weeks 8-12: Progress to full weight bearing 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, thera-band resistance exercises 0-30°, light open-chain knee isometrics

**Phase II (Weeks 12-24)**

**Weight bearing:** Full weight-bearing 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)**

**Weight bearing:** Full weight bearing 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)**

**Weight bearing:** Full weight bearing 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**