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**Post-Operative Care
for
Microfracture Rehabilitation Guidelines**

PHASE I - PROTECTION PHASE (WEEKS 0-6)

Goals:

- Protect healing tissue from Restore full passive knee extension load and shear forces Regain quadriceps control
- Decrease pain and effusion gradually improve knee flexion

Brace:

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

Weight Bearing:

- TTWB in brace with crutches for first 4 weeks (may be advanced at surgeons discretion based upon lesion size and location)
- Advance to partial weight bearing at 4 weeks with progressive advancement to WBAT at 6 weeks
- No active extension exercises for patellofemoral lesions

Range of Motion:

- Immediate motion exercise days 1-2
- Full passive knee extension immediately
- Initiate CPM on day 1 for total of 8-12 hours/day (0°-60°; if lesion > 6 cm² 0°-40°) for first 2-3 weeks
- Progress CPM ROM as tolerated 5°-10° per day
- May continue use of CPM for total of 6-8 hours per day for 6 weeks
- Patellar mobilization (4-6 times per day)
- Motion exercises throughout the day
- Passive knee flexion ROM 2-3 times daily
- Knee flexion ROM goal is 90° by 2-3 weeks
- Knee flexion ROM goal is 105° by 3-4 weeks, and 120° by week 6
- Stretch hamstrings, calf

Strengthening Program:

- Ankle pump using rubber tubing
- Quad setting
- Straight leg raises (4 directions)
- Toe-calf raises at week 4
- Stationary bicycle when ROM allows
- Biofeedback and electrical muscle stimulation, as needed
- Isometric leg press at week 4 (multi-angle)
- Initiate weight shifts at week 4
- May begin pool therapy for gait training and exercise at week 4

Functional Activities:

- Gradual return to daily activities if symptoms occur, reduce activities
- Extended standing should be avoided to reduce pain and inflammation
- Use caution with stair climbing

Swelling Control:

Ice, elevation, compression, and edema modalities as needed to decrease swelling

Criteria to Progress To Phase II:

- Full passive knee extension
- Knee flexion to 115°–120°
- Minimal pain and swelling
- Voluntary quadriceps activity

PHASE II - TRANSITION PHASE (WEEKS 6-12)**Goals:**

- Gradually increase ROM
- Gradually improve quadriceps strength/endurance
- Gradually increase functional activities

Brace:

Discontinue brace by 6 weeks

Weight-Bearing:

- Progress weight-bearing as tolerated
- Progress to full weight-bearing by 6-8 weeks
- Discontinue crutches by 6-8 weeks

Range of Motion:

- Gradually increase ROM
- Maintain full passive knee extension
- Progress knee flexion to 120°-125° by week 8
- Continue patellar mobilization and soft tissue mobilization, as needed
- Continue stretching program

Strengthening Exercises:

- Closed kinetic chain exercises (leg press 0°-60°) by week 8
- Initiate mini-squats 0°-45° by week 8
- Toe-calf raises
- Open kinetic chain knee extension without resistance
- Begin knee extension 0°-30° then progress to deeper angles
- Stationary bicycle (gradually increase time)
- Stair machine at week 12
- Balance and proprioception drills
- Initiate front and lateral step-ups
- Continue use of biofeedback and electrical muscle stimulation, as needed

Functional Activities:

- As pain and swelling (symptoms) diminish, the patient may gradually increase functional activities
- Gradually increase standing and walking

Criteria to Progress To Phase III:

- Full range of motion
- Acceptable strength level
 - Hamstrings within 10%-20% of contralateral leg
 - Quadriceps within 20%-30% of contralateral leg
- Balance testing within 30% of contralateral leg
- Able to walk 1-2 miles or bike for 30 minutes

PHASE III: REMODELING PHASE (WEEKS 13-32)**Goals:**

- Improve muscular strength and endurance
- Increase functional activities

Range of Motion:

Patient should exhibit 125°-135° flexion

Exercise Program:

- Leg press (0°-60°; progress to 0°-90°)
- Bilateral squats (0°-60°)
- Unilateral step-ups progressing from 2" to 6"
- Forward lunges
- Walking program on treadmill
- Open kinetic chain knee extension (90°-40°) – progress 1 lb every 10-14 days if no pain or crepitation – must monitor symptoms
- Bicycle
- Stair machine
- Swimming
- Ski machine/Elliptical trainer

Functional Activities:

- As patient improves, you may increase walking (distance, cadence, incline, etc.)
- Light running can be initiated toward end of phase based on physician evaluation

Maintenance Program:

- Initiate by weeks 16-20
- Bicycle – low resistance, increase time
- Progressive walking program
- Pool exercises for entire lower extremity
- Straight leg raises
- Leg press
- Wall squats
- Hip abduction / adduction
- Front lunges
- Step-ups
- Stretch quadriceps, hamstrings, calf

Criteria to Progress to Phase IV:

- Full non-painful ROM
- Strength within 80%-90% of contralateral extremity
- Balance and/or stability within 75% of contralateral extremity
- Rehabilitation of functional activities causes no or minimal pain, inflammation or swelling.

PHASE IV - MATURATION PHASE (8-15 MONTHS)**Goals:**

Gradually return to full unrestricted functional activities

Exercises:

- Continue maintenance program progression 3-4 times/week
- Progress resistance as tolerated
- Emphasize on entire lower extremity strength & flexibility
- Progress agility and balance drills
- Progress walking program as tolerated
- Impact loading program should be specialized to the patient's demands
- No jumping or plyometric exercise until 12 months
- Progress sport programs depending on patient variables

Functional Activities:

- Patient may return to various sport activities as progression in rehabilitation and cartilage healing allows.
- Generally, low-impact sports such as swimming, skating, in-line skating, and cycling are permitted at about 6 months.
- Higher impact sports such as jogging, running, and aerobics may be performed at 8-9 months for small lesions or 9-12 months for larger lesions.
- High impact sports such as tennis, basketball, football, and baseball may be allowed at 12-18 months.