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# Microfracture Protocol

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## Phase 1. Proliferation phase (weeks 0-4)

**Goals:**

- Protect healing tissue from load and shear forces
- Decrease pain and effusion
- Restoration of full passive knee extension, gradual restore knee flex
- Regain quad control

**Weight bearing: varies based on lesion location and size**

- Condylar lesions: TTWB with crutches during initial 6-8 weeks than progress to WBAT, or per physician discretion if small lesion
- Patellar.Trochlear lesions PWB progressed to WBAT after 2 weeks in knee brace. Patient braced with ROM restricted from 0-30° for 8 weeks.

**ROM**

- CPM for home up to 6-8 hours daily up to 6 weeks
- Patellar mobilizations 4-6x daily
- Passive knee flex 2-3x/daily
- Full passive knee extension immediately
- Progress ROM as tolerated, no restrictions
- Minimum ROM goals: 0-90° week 1, 0-105° week 2, 0-115° week 3, 0-125° week 4

**Strengthening program**

- Ankle pumps can use tband
- Quad sets
- Active knee extension 90-40° for condyle lesions, avoid for PF lesions
- Multiangle isometrics to quads and Hams (be aware of what contact areas are safe, and what should be avoided)
- Straight leg raises (4 directions)
- ES and/or biofeedback during quad exercises
- Initiate weight shifting with knee in extension week 2 for PF lesions
- Stationary bike week 2-3 low resistance
- NO active extension exercises for patellofemoral lesions
- For Patellofemoral lesions: in order to prevent joint compression and/or shearing forces at the repair site, the angle at which the patellar engages the trochlear groove is avoided for the first 4-6 months during strengthening exercises.

**Criteria to progress to phase 2**

- Full passive knee extension,
- Knee flex to 125
- Minimal pain and swelling

- Voluntary quadriceps activity

## Phase 2. Transition phase (weeks 4-8)

**Goals:**

- Gradually improve quadriceps strength/endurance
- Gradual increase in functional activities

**Weight bearing**

- Progress WB as tolerated
- For large femoral condyle lesions: ½ body weight with crutches at 6 weeks, 75% WB at week 7, progress to FWB at 8 weeks, discontinue crutches

**ROM**

- Gradual increase in ROM
- Maintain full passive extension
- Progress knee flexion to 135+ by week 8

**Strengthening Program**

- Progress WB exercises
- Leg press 0-60° week 4 for small femoral condyle lesions and patellofemoral lesions, progress to 0-90° week 6
- Initiate (B) leg press 0-60° for large femoral condyle lesions week 6
- Mini-squats 0-45° week 7
- Toe-calf raises week 8 for femoral condyle lesions
- Progress balance and proprioceptive drills
- Initiate anterior lunges, wall squats, anterior and lateral step ups 5 weeks for PF lesions, week 8 for small femoral condyle lesions
- For femoral condyle lesions progress NWB knee extension (LAQ) ,1lb/week
- For PF lesions, may begin NWB knee extension (LAQ) without resistance in a ROM that does not allow for articulation of the lesion
- Core stability training

## Phase 3. Remodeling phase (weeks 8-16)

**Goals**

- Improved muscular strength and endurance
- Increase functional activities

**ROM:** patient should exhibit 135+ flexion

**Exercise Program**

- for large femoral condyle lesion begin weight shifting to single leg balance**,** Initiate anterior lunges, wall squats, anterior and lateral step ups at 10-12 weeks
- Leg press 0-90°
- Bilateral squats 0-60°
- Step up progression

- Anterior lunges
- Walking program week 10
- For PF lesions may begin NWB extension 0-90° (LAQ) at week 12 from 90-40° or avoid angle where lesion articulates, progress 1 lb every 2 weeks at week 20 if no pain or crepitation, must monitor symptoms
- Continue progressing balance and proprioception
- Stairmaster/elliptical
- Swimming
- Core stability training

**Criteria to progress to phase 4**

- Full non painful ROM
- Strength within 80-90% of contralateral extremity
- Balance and/or stability within 75-85% of contralateral extremity
- No pain, inflammation or swelling

## Phase 4. Maturation phase (weeks 16-26)

**Goals:** Gradual return to full unrestricted functional activities

**Exercises:**

- Continue maintenance program progression 3-4 times per week
- Progress resistance as tolerated
- Emphasis on entire lower extremity strength and flexibility
- Progress agility and balance drills
- Impact loading program should be individualized to the patient's needs
- Progress sports programs depending on patient variables

**Functional Activities:**

- Outdoor activities such as biking and golfing are performed after 4 months. Return to running, skiing basketball, soccer and football are considered between 6-9 months. Typically sports that demand jumping, cutting or twisting may require a longer rehab period prior to return. Determination of readiness for return to play to play, however, is dependent upon the size and location of the lesion, the healing of the microfracture site, and the ability of the patient to efficiently use the muscles to absorb forces encountered during these activities.