

Physical Therapy Protocol: Microfracture Femoral Condyle

Philosophy:

Microfracture surgery is a surgical attempt to restore articular cartilage for weight bearing activities. The process is complex and when healed, produces a fibrocartilage base on the joint surface. Although the joint surface benefits from this healed fibrocartilage, the result is not as resilient as natural hyaline cartilage (unfortunately, as of yet, there is no surgery to restore human cartilage back to normal). For a younger patient, microfracture surgery is important to preserve as much cartilage function in the knee for as long as possible, therefore a commitment to non-weight bearing on the knee is needed to achieve a desirable outcome. Below are general precautions for the weight-bearing restrictions, based on lesion location, size and intra-op MD parameters. A strong, pain-free knee with functional range-of-motion only comes about through surgical intervention with careful physical therapy performed with the therapist and at home.

- **TROM Brace is locked in extension for ambulation x6 weeks, small & large lesions**
- **Small lesion** weight bearing (<2cm²):
 - 1-4 weeks NWB in brace
 - 4-6 weeks wean off crutches to FWB in brace
- **Large lesion** weight bearing (>2cm²):
 - 1-6 weeks NWB in brace
 - 6-8 weeks wean off crutches to FWB in brace

Phase I, surgery to 6 weeks

OSMS appointments:

- Medical appointments at 2 weeks, with films to assess tunnels/implanted hardware
- Physical therapy will begin as directed by your physician and as indicated on your physical therapy order

Rehabilitation Goals:

- Protect the healing tissue
- Reduce swelling
- Control pain
- Gradually restore knee ROM, quad activation

Precautions:

- Brace locked in extension for ambulation based on lesion size selected above

Range-of-Motion Exercises:

- As tolerated

Suggested Therapeutic Exercises:

- Ankle pumps
- Quad sets, 4-way SLSs
- Multi-angle isometrics
- Active knee extension 90°-40° (no resistance)
- Prone TKE
- Clam shells
- **Small lesion** (<2cm²): at 4 weeks, initiate weight shifts in standing, toe calf raises, partial WB leg presses 0-60 then progress to 0°-90° at 6-8 weeks
- **Large lesion** (>2cm²): at 6 weeks, initiate weight shifts in standing, toe calf raises, partial WB leg presses at 8-10 weeks

Cardiovascular Exercises:

- Upper body circuit training or upper body ergometer
- After 4 weeks, stationary bike with low resistance

Progression Criteria:

- Patient may progress to phase II after 6 weeks if they have full ROM, minimal pain, and fair quadriceps activations

Phase II, (after Phase I criteria met, usually at 6-12 weeks)

OSMS appointments:

- Medical appointments at 6 and 12 weeks
- Physical therapy appointments continue at once or twice weekly

Rehabilitation Goals:

- Gradually improve quad strength and endurance
- Improve tolerance to functional activities

Precautions:

- Wean from TROM brace

Suggested Therapeutic Exercises:

- Continue patellar mobilizations
- Progress gluteal strengthening with resistance to 4-way leg raises
- DL bridges, standing TKE, proprioceptive drills

- **Small lesion** (<2cm²): initiate front lunges, wall squats, front and lateral step-ups; at 8-10 weeks begin mini-squats 0°-45°
- **Large lesion** (>2cm²): toe calf raises; at 8-10 weeks initiate front lunges, wall squats, front and lateral step-ups

Cardiovascular Exercises:

- Stationary bike with low resistance, advance as tolerated

Progression Criteria:

- Progress to phase III when patient can perform 20 SLR with no extensor lag, 10 repeated single leg step downs with good form, and no reactive effusion or exacerbation of symptoms

Phase III, (after Phase II criteria met, usually after 12+ weeks)

OSMS appointments:

- Medical appointment at 12 weeks
- Physical therapy appointments fade to every 10-14 days until cleared

Rehabilitation Goals:

- Gradual return to full unrestricted functional activity and sport

Suggested Therapeutic Exercises:

- Leg presses 0°-90°
- Bilateral squats 0°-60°
- Unilateral step-ups progressing from 2in to 8in
- Core strengthening
- Forward lunge, squat holds, fire hydrants, continued balance and proprioceptive exercise

Cardiovascular Exercises:

- Stationary bike with resistance
- Stairmaster
- Swimming
- NordicTrack/elliptical
- Increase walking tolerance (distance, cadence, incline, etc.)

Progression Criteria:

- After 18 weeks, ok to begin plyometric training, progress from double and single leg hopping, agility and balance drills
- **Small lesion** (<2cm²): at 20 weeks, ok to begin jogging and progress to running; avoid high-impact sports (singles tennis, basketball, football, baseball, soccer) until 6-8 months



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- **Large lesion** ($>2\text{cm}^2$): at 24 weeks, ok to begin jogging and progress to running; avoid high-impact sports until 9-12 months

References:

- Wilk, Brotzman SB, ed. *Clinical Orthopedic Rehabilitation*. St. Louis: Mosby-Yearbook, 2003.