Knee Subchondroplasty

Physical Therapy Protocol · Symptom-Guided Progression After Bone Substitute Injection

Based on the NYU Langone Orthopedic Center (Jazrawi) subchondroplasty post-operative rehabilitation program and Rush University/Midwest Orthopaedics (Cole) post-operative instructions, with recovery expectations informed by published early-outcome series (Bonadio et al., 2017).

AT A GLANCE

TIMELINE	12+ weeks, symptom-guided; there is no structural healing restriction comparable to cartilage restoration - progression is paced by pain and effusion, and most published series show large pain reductions by weeks 1-6
WEIGHT BEARING	WBAT from day of surgery; crutches for comfort only. Some surgeons start TTWB with crutches, but most patients wean to no assistive device within 1-3 days (full WB is safe unless the surgeon directs otherwise)
KEY MILESTONES	Home exercises from day 0-1; formal PT typically begins at 1-2 weeks (after the first post-op visit); full ROM and normal gait by weeks 2-4; progressive strengthening from week 2-6
RETURN TO ACTIVITY	Desk work within days to 1-2 weeks; light recreation from ~4-6 weeks as symptoms allow; higher-impact activity gradually resumed after ~3 months per symptom response and surgeon guidance

KEY PRECAUTIONS

- Expect a transient post-injection pain flare in the first days - manage with ice, elevation, compression, and graded activity; avoid prolonged standing or walking during the first 7-10 days.
- A concomitant arthroscopy (chondroplasty, partial meniscectomy) is common - defer to the more restrictive protocol if additional procedures were performed.
- Progress by symptoms: activities that increase knee pain or swelling should be scaled back; there is no fixed protection phase but reactive effusion warrants regression.
- Underlying subchondral bone marrow lesion pathology often coexists with early osteoarthritis - long-term emphasis is low-impact loading, quadriceps/hip strength, and body-mass management.

PHASED REHABILITATION

PHASE 1 - ACUTE SYMPTOM CONTROL & HOME PROGRAM	Weeks 0-2
GOALS	• Control post-injection pain and swelling • Restore full extension and early flexion ROM • Independent ambulation without assistive device (typically within 1-3 days)
INTERVENTIONS	• WBAT immediately; if crutches used, wean from two to one (under the opposite arm) to none as tolerated, emphasizing full knee extension at heel contact • Home exercises 2-3×/day from day 0-1: ankle pumps with elevation, quad sets, heel slides, SLR (3-5×10), passive extension to 0° • Ice 20 minutes before and after exercise (near-continuous icing first 24-48 hours with skin protection); compression wrap until swelling resolves; elevation above heart • Progressive additions as comfort allows: 4-way SLR (add abduction/adduction), hamstring curls, knee extension 90°-45°, mini squats to 30° • Stationary bike 2-5 minutes once ROM permits • Formal PT deferred until ~2 weeks (or per surgeon, no sooner than 7 days); avoid prolonged standing/walking days 0-10
CRITERIA TO ADVANCE	• Ambulating without assistive device with symmetrical step length • Full passive extension; flexion approaching functional range (≥110-120°) • Pain and swelling trending down; incisions healed/dry

PHASE 2 - MOTION & EARLY STRENGTHENING	Weeks 2-6
GOALS	• Full pain-free ROM and normalized gait • Re-establish quadriceps and hip strength base • Return to daily activities and light work
INTERVENTIONS	• Formal PT 1-2×/week with progressed home program • Quadriceps progression: TKEs, knee extension through comfortable arc, leg press in pain-free range, mini to quarter squats • Hip and core strengthening: bridges, clamshells, 4-way hip work, standing hip abduction • Stationary bike with progressive duration/resistance; pool walking if available • Gait drills and single-leg stance balance work • Patellar and soft-tissue mobilization as needed; continue ice after sessions
CRITERIA TO ADVANCE	• Full ROM symmetrical to opposite knee; no effusion increase with exercise • SLR without lag; single-leg stance ≥15-30 seconds • Normalized gait on level ground and stairs (step-to as needed)

Guideline only — individualize per intraoperative findings and patient response. Questions: contact Dr. Pettit's office.

PHASE 3 - PROGRESSIVE LOADING & CONDITIONING	Weeks 6-12
GOALS	• Restore functional lower-extremity strength (sit-to-stand, stairs, floor transfers) • Build low-impact aerobic capacity • Tolerate progressive daily and occupational loading without symptom flare
INTERVENTIONS	• CKC strengthening progression: squats to comfortable depth, step-ups and step-downs, lunges within pain-free range, leg press with progressive load • Continued OKC quadriceps and hamstring strengthening • Balance/proprioception progression on stable then compliant surfaces • Low-impact conditioning 20-40 minutes: bike, elliptical, swimming, walking program with graded distance • Monitor with 24-hour symptom rule: soreness or swelling lasting beyond 24 hours means reduce load one step
CRITERIA TO ADVANCE	• Reciprocal stair negotiation without pain; 30-second sit-to-stand comparable to age norms • Quadriceps/hip strength grossly symmetrical (HHD symmetry approaching 80-90% where measured) • No reactive effusion with full daily activity and conditioning program

PHASE 4 - RETURN TO FULL ACTIVITY	Month 3+
GOALS	• Return to desired recreation, prioritizing low-impact activity for joint health • Independent long-term maintenance program
INTERVENTIONS	• Graded return to recreation as symptoms allow: golf, cycling, hiking, doubles racquet sports; jogging or impact activity only if symptom-free and cleared by the surgeon • Maintenance strengthening 2-3×/week emphasizing quadriceps, hip abductors, and calf • Activity-modification and body-mass counseling given the association of bone marrow lesions with joint overload and early arthritis • Re-consult surgeon for recurrent effusion, night pain, or plateaued pain relief (radiographic follow-up as indicated)
CRITERIA TO ADVANCE	• Pain-free (or baseline) ADLs and chosen recreation without reactive swelling • Strength and balance adequate for activity demands • Patient independent with home maintenance program

GUIDING PRINCIPLES

This protocol follows criterion-based progression over rigid time-based advancement; phased rehabilitation balancing tissue healing with controlled stress application; objective milestones (ROM, strength LSI, functional testing) to guide phase transitions; individualization based on surgical findings, tissue quality, and patient factors; and ongoing surgeon–therapist communication throughout recovery.

REFERENCES

1. NYU Langone Orthopedic Center (Jazrawi LM). Subchondroplasty Post-Op Knee Rehabilitation Program and Post-Operative Instructions. https://www.newyorkortho.com/pdf/subchondroplasty-postop-knee-rehab-and-discharge.pdf

2. Midwest Orthopaedics at Rush (Cole BJ). Postoperative Instructions: Knee - Subchondroplasty. https://www.briancolemd.com/wp-content/themes/ypo-theme/pdf/knee-subchondroplasty-post-op.pdf

3. Bonadio MB, Giglio PN, Helito CP, Pecora JR, Camanho GL, Demange MK. Subchondroplasty for Treating Bone Marrow Lesions in the Knee - Initial Experience. Rev Bras Ortop. 2017;52(3):325-330.

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For clinical use by licensed physical therapists treating patients of Robert Pettit, MD. This document is a rehabilitation guideline, not a substitute for clinical judgment. Progression must be individualized based on intraoperative findings, tissue quality, and patient response. Scan the QR code for the current version of this protocol.