BEN MAYO, MD
SHOULDER, ELBOW, HIP, AND KNEE SURGERY

www.BenMayoMD.com
Phone: 855-750-5757

Surgical Rehabilitation Protocol
Knee Osteochondral Allograft/Autograft Transplant (OATS)

The following information is to help make your recovery from surgery as smooth and rapid as possible. If you have any questions or concerns, contact the Dr. Mayo's team at the number above. You will have appointments with Dr. Mayo at ~2 weeks and ~6 weeks postop.

Phase 1: Recovery from Surgery – 0-6 Weeks After Surgery

Goals	• Protection of osteochondral graft fixation • Educate patient on rehab progression • Diminish joint swelling and pain • Restore patellar mobility • Restore full passive knee extension • Gradually improve knee flexion • Re-establish quadriceps control and activation • Restore independent ambulation within precautions
Precautions	• ***Brace***: Bledsoe brace when ambulating (4 weeks) • ***Weight Bearing***: Toe touch weight bearing for 2 weeks, then progress 25% per week until full weight bearing • ***Range of Motion***: No restriction • **Wound Care**: No swimming or submerging in water until wounds healed • ***Call Dr. Mayo if***: Significant wound drainage or dehiscence, purulence, erythema.
Therapeutic Exercises *See last page for example exercises*	• ***Strengthening***: Quad sets, four-way SLR, ankle pumps, open chain hip strengthening, core strengthening, multi angle isometrics, active knee extension 90-40 degrees no resistance, isometric leg press (week 4) • ***Range of motion***: Passive and active range of motion exercises 3 times per day. Goal 90 degrees by 2 weeks, 115 by 4 weeks, 125 by 6 weeks • ***Proprioception***: None • ***Conditioning***: Stationary bicycle when range of motion allows with no resistance using other leg for majority of force • ***Modalities***: BFR, NMES • ***Manual Therapy***: Patella and soft tissue mobilization, active and passive flexion

Home Instructions	• ***Wound Care***: Remove large bulky dressing on postoperative day 3. Leave white bandaids (Steri-strips) in place. Sutures will be removed at ~2 weeks in clinic.
	• ***Bathing***: Showering permitted once after bulky dressing removed. No submerging in water (bath/pool/lake/etc.) for 4 weeks.
	• ***Driving***: Must be off all narcotic pain meds when operating vehicle
	  ○ 1 week for automatic cars, left leg surgery
	  ○ 6 weeks for standard/manual cars or right leg surgery
	• ***Sleeping***: Sleep with brace locked in extension for 2 week, then OK to unlock
	• ***Ice and Elevation***: Ice as much as tolerated for the first week, elevate leg with knee in full extension as much as possible. Ice as needed after 1 week.
	• ***Home Exercise***: As instructed by PT. Range of motion exercises multiple times per day. Quad sets and straight leg raises in brace up to 300-500 per day.

Criteria to Progress	☐ Knee ROM: >90 degrees ☐ Perform SLR without quad lag and good quad activation ☐ Normalized gait per precautions ☐ Normal patellar mobility ☐ Minimal swelling/inflammation

MendelsonKornblum
Orthopedic & Spine Specialists
Updated Jul-24

BEN MAYO, MD
SHOULDER, ELBOW, HIP, AND KNEE SURGERY

www.BenMayoMD.com
Phone: 855-750-5757

Surgical Rehabilitation Protocol
Knee Osteochondral Allograft/Autograft Transplant (OATS)

The following information is to help make your recovery from surgery as smooth and rapid as possible. If you have any questions or concerns, contact the Dr. Mayo's team at the number above. You will have appointments with Dr. Mayo at ~12 weeks postop

Phase 2: Early Strengthening/Neuromuscular Control – 6-12 Weeks After Surgery

Goals	• Elimination of inflammation and swelling • Gradually improve ROM and WB to full • Full knee ROM (0-135 degrees) or hyperextension if normal • Normal gait on all surfaces without brace or assistive device • Improve lower extremity strength, proprioception, balance, neuromuscular control, and confidence • Demonstrate stability with dynamic knee activities (no varus/valgus deviations)
Precautions	• ***Brace***: Discontinue brace • ***Weight Bearing***: Progress to full weight bearing and wean from crutches. No impact activities (running, jumping, etc.) until 6 months. • ***Range of Motion***: No restrictions • ***Call Dr. Mayo if***: Not achieving full range of motion, large effusion
Therapeutic Exercises *See last page for example exercises*	• ***Strengthening***: Multi-plane closed chain activities, open chain, core strengthening and functional standing activities. • ***Proprioception***: One leg balance, wobble boards, BAPS • ***Conditioning***: Stationary bike, elliptical, swimming. • ***Modalities***: BFR, NMES • ***Manual Therapy***: Patella and soft tissue mobilization, passive knee flexion to 135 degrees, prone quadriceps stretching, joint mobilization as needed
Home Instructions	• ***Driving***: OK to drive assuming off narcotic pain medication • ***Sleeping***: OK to remove brace • ***Ice and Elevation***: Ice as needed for pain and swelling after activity • ***Home Exercises:*** As instructed by physical therapy
Criteria to Progress	☐ Full ROM ☐ No pain with exercises, no effusion or limp ☐ >80% strength limb symmetry ☐ Satisfactory clinical exam by surgeon

MendelsonKornblum
Orthopedic & Spine Specialists
Updated Jul-24

Surgical Rehabilitation Protocol
Knee Osteochondral Allograft/Autograft Transplant (OATS)

The following information is to help make your recovery from surgery as smooth and rapid as possible. If you have any questions or concerns, contact the Dr. Mayo's team at the number above. You will have appointments with Dr. Mayo at ~6 months postop.

Phase 3: Return to Activity – 12-20 Weeks After Surgery

Goals	• Enhance muscular power and endurance • Improve neuromuscular control and proprioception exercises • Improve aerobic endurance – no jogging
Precautions	• **No plyometric or impact activities like running until 6 months** • ***Brace***: None • ***Call Dr. Mayo if***: Increased effusion, failure to progress to return to sport
Therapeutic Exercises *See last page for example exercises*	• ***Strengthening***: Emphasis on eccentric strengthening and control • ***Proprioception***: Dynamic neuromuscular control multi-plane • ***Conditioning***: Non-impact only - Stationary bike, elliptical, swimming.
Home Instructions	• ***Home exercises*:** Workouts in gym, focus per physical therapist
Criteria to Progress	☐ No pain with exercise strengthening ☐ Good knee control with single leg dynamic proprioceptive activities ☐ 80% LSI ☐ Satisfactory clinical exam

BEN MAYO, MD
SHOULDER, ELBOW, HIP, AND KNEE SURGERY

www.BenMayoMD.com
Phone: 855-750-5757

Surgical Rehabilitation Protocol
Knee Osteochondral Allograft/Autograft Transplant (OATS)

The following information is to help make your recovery from surgery as smooth and rapid as possible. If you have any questions or concerns, contact the Dr. Mayo's team at the number above. You will have appointments with Dr. Mayo at ~9 months and 12 months postop.

Phase 4: Return to Activity – 20+ Weeks After Surgery

Goals	• Normalize lower extremity function for all activities • Enhance muscular power and endurance • Improve neuromuscular control and proprioception exercises • Perform sport-specific drills • Initiate plyometric exercises • Improve aerobic endurance • Physician clearance to return to sports
Precautions	• ***Call Dr. Mayo if***: Increased effusion, failure to progress to return to sport
Therapeutic Exercises *See last page for example exercises*	• Plyometric training added gradually – double leg at week 20, progress to single leg • Return to running program at 6 months • Sport specific activities and skill work • Agility drills and cutting after 6 months • Sport specific conditioning
Home Instructions	• ***Home exercises***: Workouts in gym, focus per physical therapist
Criteria to Progress	☐ Full Range of Motion ☐ No pain with forward running, agilities, jump training, or strengthening ☐ Good knee control with single leg dynamic proprioceptive activities ☐ Satisfactory clinical exam ☐ Return to sport no sooner than 8 months for moderate impact sports, 10 months for high impact - determined by Dr. Mayo ☐ For return to athletic must pass return to sport testing – 90% LSI and function testing

MendelsonKornblum
Orthopedic & Spine Specialists
Updated Jul-24

BEN MAYO, MD
SHOULDER, ELBOW, HIP, AND KNEE SURGERY

www.BenMayoMD.com
Phone: 855-750-5757

Surgical Rehabilitation Protocol
Knee Osteochondral Allograft/Autograft Transplant (OATS)

Sample Rehabilitation Exercises by Phase

Phase I	Phase II
Week 0-6	**Week 6-12**
Week 0-6: **Range of Motion** • Ankle pumps • Overpressure into full, passive knee extension • Active and passive gradual knee flexion 0-90 degree • Hamstring and gastrocnemius stretch • Heel slides, AAROM prone knee flexion, seated flexion stretch **Strengthening** • Straight leg raises (Flexion, Abduction, Adduction) • Quadriceps activation sets and stimulation • Calf strengthening • Multi-angle isometric at 90-60 degree extension • Knee extension 90-40 degrees • OKC passive/active joint repositioning 90,60, 30 degrees **Manual Therapy/Modalities** • NMES is strongly recommended • Patellar mobilization • Blood flow restriction	**Week 6-8:** **Range of Motion** • Advance ROM **Strengthening** • Progress isometric strengthening program • Leg press (0-100 degrees) • Knee extension 90 to 40 degrees - Avoid open chain quad strengthening 30-0 degrees • Passive/active reposition OKC • Hamstring Curls (isotonics) • Hip Abduction and Adduction • Hip Flexion and Extension • Wall slides/squats • Vertical Squats • Standing or Seated Toe Calf Raises **Endurance** • Bicycle and elliptical low resistance • Unloading treadmill walking **Proprioception/Plyometric** • Proprioception Drills • Biodex Stability System (Balance, Squats, etc) • Progress to balance and ball throws • Tilt board repositioning, balance, and squats (perturbation) **Week 8-12** • Continue all exercises listed in Weeks 4-6 **Strengthening** • Leg Press Sets (single leg) 0-100 degrees and 40-100 degrees • Isokinetic exercises (90 to 40 degrees) (120 to 240 degrees/second) • Lateral Step-Overs, Lunges (straight plane and multi-plane drills) • Lateral Step Ups, Front Step Downs **Proprioception/Plyometric** • Biodex stability system • Training on tilt board • Perturbation Training **Endurance** • Walking Program • Bicycle/Stair Stepper/Elliptical Machine for endurance

MendelsonKornblum
Orthopedic & Spine Specialists
Updated Jul-24

Surgical Rehabilitation Protocol
Knee Osteochondral Allograft/Autograft Transplant (OATS)

Phase III	Phase IV
Weeks 12-20	**Weeks 20-52**
Strengthening • Continue strengthening – emphasize eccentric strength and control • Leg press • Squats • Hip Abd/Adduction • Hip Flex/Ext • Knee Extension • Hamstring curls • Standing toe calf raises • Step down • Lateral step ups • Lateral lunges • Neuromuscular training • Tilt board drills • Spin bike • Cybex training **Proprioception/Plyometric** • Advance proprioceptive exercises (BOSU, single leg dynamic balance, dual task balance) **Endurance/Sport Specific** • Pool Program (Running, agility, Backward Running, Hip and Leg Exercises) at 16 weeks • Elliptical, stationary bike, stair stepper	Strengthening • Continue strengthening - advance resistance and repetitions (ball hamstring curls, single leg press, core stabilization) • Continue all strengthening drills • Plyometric leg press • May initiate lateral agility drills • Backward running • Spin bike • Cybex training Proprioception/Plyometric • Pre-running exercises (low skips, punch steps, double punch steps, hurdle walks, high skips, kickbacks, step-overs) • Agility drills (ladder, side shuffles, crossovers, backwards run, quick start/stops, zig-zags, cutting) • Jump training (shuttle training, trampoline, landing technique, box jumps, single leg hops, tuck jumps) • Return to running at 6 months – treadmill, with transition to level outdoor surfaces Endurance/Sport Specific • Progress level of participation in sport specific training • Running/cutting/agility drills