



7858 Shrader Road

Richmond, Virginia 23294

Post-Operative Rehabilitation Guidelines Cartilage Repair

The following guidelines are a criteria and patient specific progression intended to guide the return to desired activity after cartilage restoration with autograft (e.g. OATS, mosaicplasty) or osteochondral allograft (OCA) transplantation. Concomitant procedures may require modification to the below protocol. Please contact prescribing physician with questions or concerns.



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POST-OPERATIVE PHASE I: Week 0-6

GOALS	<ul style="list-style-type: none">▪ Control post-op pain/swelling▪ ROM 0°-130°▪ Prevent Quadriceps inhibition▪ Restore full passive knee extension▪ Restore normal gait pattern▪ Normalize proximal muscle strength (glutes, core)▪ Normalize patellar mobility▪ Independence in home exercise program
PRECAUTIONS	<ul style="list-style-type: none">▪ DO NOT PUSH ROM▪ Progressive weight bearing after surgery▪ Control post-operative swelling▪ No open chain lower extremity resistance
TREATMENT	<ul style="list-style-type: none">▪ Brace
RECOMMENDATIONS	<ul style="list-style-type: none">○ Post-op hinged brace for 2 weeks.



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TREATMENT
RECOMMENDATIONS
(Cont.)

- Locked in Extension for WB activities
- Weight Bearing:
 - Progressive weight bearing with crutches after week 1
 - 1 week Foot Flat 20% with bilateral axillary crutches
 - Progressive WB at week 2 (2 crutches → 1 crutch/cane → 0 crutch)
 - Discharge assistive device by end of week 4- **AT THERAPISTS DISCRETION**
- ROM/Soft tissue:
 - Immediate ROM after surgery
 - Emphasize full knee extension immediately
 - AROM/AAROM exercises (pain free ROM) 3x/day
 - Seated knee flexion off table
 - Heel slides against wall



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TREATMENT
RECOMMENDATIONS
(Cont.)

- DO NOT PUSH ROM!!!
- Heel prop for knee extension (5 minute intervals) multiple times per day
- Patellar/infrapatellar soft tissue mobilizations in all planes 3-4 times/day
- LE stretching (Hip, hamstring, gastroc/soleus)

- ROM Goals (USE AS A GUIDELINE!!!)
 - Week 2- 90° flexion
 - Week 3- 105° flexion
 - Week 4- 115° flexion
 - Week 6- 130° flexion

- Quadriceps re-education.
 - Quad sets, SLR with EMS
 - SLR's (all planes)
 - Emphasize no extension lag during exercise



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TREATMENT
RECOMMENDATIONS
(Cont.)

- Leg Press (60°-0° arc, progressing to 90°-0° arc)
- Multi-angle quadriceps isometrics
- BFR aided quadriceps strengthening if available
- Initiate core stabilization program
 - Multiplanar glute/Core/hip strengthening
- Short Crank Bike
- Weight shift exercises with UE support – Week 2
 - Single leg balance/proprioceptive activities after proper quad control obtained
- Aquatic therapy (if available) when incisions are healed- week 4-6
- Initiate step-ups at week 4
 - Start with 4" step and progress with adequate quad strength

EMPHASIZE

- Early patellar mobilization
- Early Quadriceps re-education



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MINIMUM CRITERIA
FOR ADVANCEMENT
TO NEXT PHASE

- Minimize effusion and inflammation
- Normalized Gait pattern
- ROM 0°-130°
- SLR (supine) without extension lag
- Normal patellar mobility



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POST-OPERATIVE PHASE II: Weeks 6-12

GOALS	<ul style="list-style-type: none">▪ Gradual increase of ROM▪ Ascend/Descend 8" step with good control and without pain▪ Gradual increase in functional activities
PRECAUTIONS	<ul style="list-style-type: none">▪ Avoid pain with therapeutic exercises and functional activities▪ Continue to control post-operative swelling
TREATMENT RECOMMENDATIONS	<ul style="list-style-type: none">▪ Gradual increase of ROM to full ROM.<ul style="list-style-type: none">○ Knee flexion step stretch○ Prone knee flexion stretch○ Maintain full passive knee extension○ Heel prop with weight○ Prone knee extension hang with weight▪ Continue patellar mobilization as needed▪ Continue with LE stretching program (hip, hamstring, gastroc/soleus)▪ Initiate foam rolling program



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TREATMENT
RECOMMENDATIONS
(Cont.)

- Progress stationary bike time- Gradually increase time to 2 (20min) sessions/day
- Initiate interval bike program between weeks 8-10
- Progress to elliptical – Week 10
- Underwater TM/Alter-G gait training if gait pattern continues to be abnormal
- Romanian Deadlift
 - DL- Week 6
 - SL- Week 8
- Continue (B) Leg Press with progressive weight as tolerated
 - Band around knees to avoid valgus breakdown
 - Progress to eccentric leg press (2 up/1 down) – Week 6
 - Chair Squats – Week 6
- Continued step-up progression (controlled 8" eccentric step down by week 12)



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	<ul style="list-style-type: none">○ Emphasize proper movement pattern (no hip drop, no valgus breakdown)▪ Front lunges → Traveling lunges- Week 8▪ TRX Squats-Week 8▪ Progressive glute/hip strengthening▪ Progress balance/proprioception▪ Initiate walking program
EMPHASIZE	<ul style="list-style-type: none">▪ Restoration of functional strength prior to initiation of impact activity
MINIMUM CRITERIA FOR ADVANCEMENT TO NEXT PHASE	<ul style="list-style-type: none">▪ 85% limb symmetry on Isokinetic testing▪ No pain, inflammation or swelling after activity



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POST-OPERATIVE PHASE III: Week 12-18

GOALS	<ul style="list-style-type: none">▪ Return to normal ADL's▪ 85% limb symmetry on Isokinetic testing▪ Improve muscular strength and endurance
PRECAUTIONS	<ul style="list-style-type: none">▪ Avoid pain with therapeutic exercises and functional activities▪ Continue to control post-operative swelling▪ Progress with running ONLY if adequate quad control and strength is present
TREATMENT RECOMMENDATIONS	<ul style="list-style-type: none">▪ Patient should demonstrate full ROM without limitations▪ Strengthening<ul style="list-style-type: none">○ Continue to progress with squat program○ Add weight as needed○ Continue to progress with eccentric leg press○ Progress with TRX squats○ Eccentric DL squats



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TREATMENT
RECOMMENDATIONS
(CONT.)

- SL squats focusing on control and technique
- Progress with interval biking for endurance
- Progress with Step-ups
 - Progress to 12-18" step
- Advanced proprioception training (perturbations)
- Begin agility training
- Continue to progress with Aquatic program if available
- Stairmaster
- Continue with core progression
- Continue with LE stretching
- Alter-G running progression
- Progress to interval running program (be cautious of overloading knee)

EMPHASIZE

- Controlled introduction of impact activity
- Immediate cessation of impact if pain or swelling



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MINIMUM CRITERIA
FOR ADVANCEMENT
TO NEXT PHASE

- 85% limb symmetry on Isokinetic testing
- No pain, inflammation or swelling after activity

POST-OPERATIVE PHASE IV: Week 18-Return to Sport (if applicable)

GOALS

- No apprehension with sport specific movements
- Maximize overall lower extremity strength and flexibility to meet demands of sport and activity
- Hop testing > 90% limb symmetry
- Isokinetic test > 85-90% limb symmetry

PRECAUTIONS

- Be cautious of Patellofemoral overload with increased activity level
- Avoid pain with progression of sports specific activity or with running



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TREATMENT
RECOMMENDATIONS

- Strength Maintenance program 3-4 times/week
- Bike/Elliptical lower resistance
- Glute Activation exercises
- Chair/Box Squats
- Leg press
- Multiplanar hip strengthening
- Front/Side/Back lunges
- SL RDL
- LE stretching
- Alter-G running progression (5-6 mos post op)
- Must have good control and alignment with 8" eccentric step down
- Progress to interval TM running program (be cautious of overloading knee)
- Plyometric program
- Individualized per sport and patient need
- Progress strength and flexibility through entire kinetic chain (hips, knees, ankle)
- Progress with agility and balance drills



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MINIMUM CRITERIA
FOR RETURN TO
SPORT

- Progress with sport specific programs
- Hop testing 90% limb symmetry
- Isokinetic test > 85% limb symmetry
- 20 minute running without pain
- Y-balance test (or equivalent) 90% limb symmetry
- Independent with gym strengthening and maintenance program