Virtua Reconstructive Orthopedics
SPORTS MEDICINE & ARTHROSCOPY

Sean Mc Millan, DO, FAOAO
Director of Virtua Orthopaedic Sports Fellowship
Chief of Orthopedics: Virtua Mount Holly Hospital
2103 Burlington-Mount Holly Rd
Burlington, NJ 08016
(609) 747-9200 (office)
(609) 747-1408 (fax)
Website: www.drseanmcmillan.com

Exertional Compartment Syndrome Release Rehab Protocol

PHASE I Protection and Mobility (surgery to 2-3 weeks after surgery)

Appointments	Rehabilitation appointments begin 5-7 days after surgery and continue 1 time every 5-10 days
Rehabilitation Goals	• Administer Foot and Ankle Ability Measure (FAAM) both ADL and sport subscales • Protection of the post-surgical compartment • Minimize postoperative swelling; lower extremity circumference within 2 cm of uninvolved side at mid-calf • Instruction in safe positioning and limb self-management • Restore normal knee and ankle range of motion • Able to lift leg involved leg in all directions in standing without pain or compensation • Restore ability to control leg in open and closed kinetic chain during gait • Non-antalgic gait
Precautions	• Use axillary crutches for gait with progressive weight bearing as tolerated • Avoid any activity which causes increased swelling • Avoid any friction on new scar • Avoid any impact activity including running, jumping, or hopping (6-8 weeks)
Suggested Therapeutic Exercise	• Active range of motion (AROM) of the ankle begins immediately to maintain extensibility of soft tissues as they heal to prevent postoperative contractures; progress to open kinetic chain strengthening with theraband as able • Quadriceps sets • Leg lifts for hip strength

	• Elevation, compression, and icing, as needed, for swelling control • Active muscle pumping for swelling control • Gentle distal-to-proximal massage to assist with venous return and swelling

Cardiovascular Fitness	• Upper body circuit training or upper body ergometer, as able • Begin with 5-10 minutes, 1-2 times/day, and progress as able
Progression Criteria	• Patient may progress to Phase II after meeting Phase I goals

PHASE II: Light Strengthening (begin after meeting Phase I criteria, usually 2-3 weeks following surgery)

Appointments	• Rehabilitation appointments are 1 time per week on average
Rehabilitation Goals	• Lower extremity circumference within 1 cm of uninvolved side • Incision well healed • Minimize muscle atrophy and flexibility deficits in involved compartment • Single leg stance control with eyes open • Full flexibility/mobility of gastrocnemius/ankle • Maintain motion and strength of uninvolved muscle groups, as well as cardiovascular endurance • Perform active or gentle resisted exercises of the hip of the operated lower extremity and resistance exercises of the upper extremities • Proper lower extremity control and alignment with no pain during functional double leg squats • Non-antalgic gait on level surface with full weight bearing and no assistive device • 8 point (or greater) improvement on ADL portion of the baseline FAAM
Precautions	• Avoid over-stressing new scar formation by avoiding any friction over tissue (as per Phase I) • Avoid post-activity swelling by limiting prolonged weight bearing activity as appropriate; if swelling occurs, manage with rest, ice, elevation and compression (as per Phase I) • Avoid eccentric loading
Suggested Therapeutic Exercise	• Scar massage/mobility and desensitization • Gentle stretching and nerve mobilizations to tissue in involved compartment • Progress open kinetic chain ankle strengthening as tolerated • Balance and proprioception exercises: progression of bilateral to unilateral balance activities first on a level, firm surface, then on a soft/unstable surface • Gait drills: begin with sagittal plane and progress to frontal and transverse planes
Cardiovascular Fitness	• Upper body circuit training, upper body ergometer (as per Phase I)
	• May begin stationary biking if wound is healed • Begin treadmill or track walking if wound is healed; progress time and speed as able • May swim or water walk if wound is FULLY healed

Progression Criteria	• Patient may progress to Phase III if Phase II goals are met

PHASE III: Progression of Strengthening (begin after meeting Phase II criteria, usually 4-6 weeks after surgery)

Appointments	• Rehabilitation appointments are once every 7-10 days
Rehabilitation Goals	• Prevent post-operative recurrence of symptoms with all activity • Tolerate 15-30 minutes of continuous aerobic activity without the onset of symptoms/pain • Reinforce self-monitoring and review signs of recurrence and complications • Normal (rated 5/5) ankle strength and pain free • Proper lower extremity control and alignment and no pain with single leg functional movements including squats and lunges • No residual swelling 12-24 hours following all physical activity (including impact exercises) • No pain 1-2 hours following physical activity (including impact exercises)
Precautions	• Avoid friction over scar tissue (as per Phases I and II) • Avoid post-activity swelling (as per Phases I and II) • No strenuous activity until wound is fully healed • No running until 6-8 weeks postoperatively (patient should be advised by sports rehabilitation provider or physician prior to initiation of any running) • Avoid pain with any exertional activity
Suggested Therapeutic Exercise	• Lower extremity stretching and nerve mobilizations as appropriate (as per Phase II) • Lower extremity myofascial stretching/foam rolling • Progression of lower extremity closed chain functional strengthening including lunges, step-backs, and single leg squats • Progress heel rise to single leg • Progress gait drills • Initiate plyometric exercises (with focus on lower extremity control and alignment at hip, knee, and ankle) at 6 weeks; begin with 2 feet to 2 feet (jumping) progressing from 1 foot to other (leaping) and then 1 foot to same foot (hopping); and focus on proper landing/deceleration mechanics
Cardiovascular Fitness	• Initiate or progress swimming or water walking if wound is fully healed (as per Phase II) • Progress walking time and speed (as per Phase II)

	• May begin elliptical trainer as tolerated • Light jogging can be initiated at 6-8 weeks; initially begin on level surface while avoiding hills and speed work; runners should consider interval training involving walking; progress jog interval times, incline, and speed as appropriate for return to sport/activity goals; and for those returning to multi-planar sport, consider progression of multiplanar activity
Progression Criteria	• Patient may progress to Phase IV after meeting Phase III goals

PHASE IV: Impact/Sport Training (begin after meeting Phase III criteria, approximately 8-12 weeks following surgery)

Appointments	• Rehabilitation appointments are 1 time every 1-2 weeks
Rehabilitation Goals	• Administer ADL and sport subscales on the FAAM prior to discontinuation of rehabilitation • 9 point (or greater) improvement on the sport subscale portion of the baseline FAAM • Proper dynamic neuromuscular control and alignment with eccentric and concentric multi-plane activities (including impact) for return to work/sports, without pain, instability or swelling • Within 90% of pain free plantarflexion and dorsiflexion strength
Precautions	• Avoid pain with any exertional activity • Avoid post-activity swelling (as per phases I through III)
Suggested Therapeutic Exercise	• Biomechanical assessment of specific sport activity with video analysis as needed (running, biking, etc.) • Instruct in proper return to activity progression (incremental running, biking, etc.) • Progressive strengthening exercises using higher stability, and neuromuscular control with increased loads and speeds and combined movement patterns; begin with low velocity, single plane activities and progress to higher velocity, multi-plane activities; and begin with forward and backward, progress to side-to-side, diagonals and transverse plane movements • Integrate movements and positions into exercises that simulate functional activities; and initiate sport-specific training with low-intensity simulated movements
Cardiovascular Fitness	• Replicate sport or work specific energy demands
Progression Criteria	• Patient may return to sport/work if they have met the above stated goals and have approval from the sports rehabilitation provider or physician • Precautions to reduce the risk of re-injury when returning to sports or high-demand activities as appropriate; if collision/contact sport, may consider protective padding over area of scar tissue

***** Please note protocol adapted from the University of Wisconsin Protocol.**