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Exertional Compartment Release Protocol (Non-traumatic)

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PHASE 1 Protection and Mobility (surgery to 2-3 weeks postop)
Appointments: Rehabilitation appointments begin 5-7 days after surgery, continue 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 2: Light Strengthening (begin after meeting phase 1 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 3: 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 4: Impact/Sport training (begin after meeting phase 3 criteria, approximately 8-12 weeks following surgery)
Appointments
• Rehabilitation appointments are 1 time every 2-3 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