Dr. Boyette Foot/Ankle Procedures

Foot/Ankle Procedures

Ankle Fracture Post-Op Rehabilitation Protocol
Peroneal Tendon Repair Rehabilitation Protocol
Ankle Arthroscopy with Talus OCD Microfracture
Modified Brostrom-Gould Repair for Chronic Lateral Ankle Instability
Posterior Tibial Tendon Surgery (FDL Transfer and Calcaneal Osteotomy)
Achilles Tendon Repair with FHL/FDL Tendon Transfer
Ankle Arthroscopy Post-Surgical
Achilles Tendon Repair

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Ankle Fracture Post-Op Rehabilitation Protocol

Post Op	Goals	Precautions	Exercises
Weeks 0-6	• NWB in cam walker • DF to neutral • Control edema	• Monitor Pain and Swelling If either, increase, modify rehab	• Increase Dorsiflexion-to restore gait • PRICE • Ankle pumps • E-stim if needed
Week 6	• Initiate weight-bearing as tolerated with crutches • AROM for ankle, subtalar, midtarsal joints within pain tolerance		• Ankle pumps • Inversion/Eversion • Toe crunches • Ankle alphabet • Towel stretch for DF • E-stim with elevation for edema • Retrograde massage • Wean to on crutch and PWB as 6 weeks s/p approaches
Weeks 6-8	• FWB involved LE • >50% AROM all planes involved ankle and subtalar joint • Control edema • Minimize complications • Maintain optimal bones and soft tissue healing environment		• Gait training level surfaces with proper tibia advancement, quads activation, symmetrical weight-bearing • Stationary bike • Grade 1-2 joint mobilization ankle and subtalar joints • PROM into restricted ranges • Retrograde massage for edema • Continue DF stretches • Theraband DF/PF/inv/ev in open chain • Seated heel raise and BAPS • Manual resistance in open chair for DF/PF/inv/ev and multiplanar motions • Leg extensions • Leg curl • Leg press • Wall stretch with knee flexed and extended • When FWB: Standing BAPS 2 legs Standing heel raise Minisquat One leg balance on floor

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Post Op	Goals	Precautions	Exercises
Weeks >8	• Full ankle and subtalar AROM, flexibility • Restore gait on level surfaces, hills, stairs • Full return to function		• CKC theraband exercises (stand on involved leg and perform hip flex/ext/abd/add with uninvolved LE) • BAPS knees bent Eyes Closed One leg • Storking Eyes open/eyes closed Floor/Mat • Standing balance profess floor-mat Eyes open/closed Leve/incline/decline With knee flex/ext • Continue phase 2 ex's • Stairmaster • Agility ex's Karioke Lateral shuffles Tandem Walking • Continue gait training • Continue modalities prn • Sport and Job-specific training

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Peroneal Tendon Repair Rehabilitation Protocol

Post Op	Goals	Precautions	Exercises
Phase I **Weeks 2-6**	• Manage pain and edema • Increase ROM • Increase tolerance of muscle contraction	• Pt. usually immobilized for at least 6 weeks • Non-weight bearing for 6 weeks followed by progressive weight bearing • Pain and edema • Limited AROM and Strength • Avoid stairs and ladder work for 12 weeks	• Modalities as needed • Soft tissue/scar mobilization • Begin cardiovascular training (UBE, well-leg cycling, or cycling in boot) • Progressive resistance exercises for hip and knee in all ranges • Patient education
Phase II **Weeks 6-12**	• Manage pain and edema • Increase ROM • Improve strength and proprioception • Wean from walking boot per physician (usually 8-12 weeks), utilizing only with increased symptoms	• Criteria to progress is no increased pain or loss of ROM and Improved Tolerance to Weight Bearing • Mild pain and edema • Limited AROM and strength • Abnormal gait	• Begin WBAT in cam walker • Continue with Phase I interventions as indicated • Begin pain-free, non-weight bearing AROM exercises (i.e., ankle pumps, alphabet) • Begin submaximal isometrics in all planes while ankle is maintained in neutral position • Gentle joint mobilizations as indicated (i.e., limited talocrual dorsiflexion) • Begin gentle, pain-free PROM • Strengthen intrinsic foot muscles (i.e. towel scrunches, marble pick-up, arch lifts) • Pool therapy (shallow water proprioceptive/gait activities and deep water running) • Stationary bicycle with walking boot • Light elastic tubing exercises in all planes may be initiated in late phase II • Seated heel raises

Phase III
 	
Weeks 12-20
	• Decreased pain with weight bearing and gait
	• Full AROM and PROM
	• Symmetrical strength and proprioception
		• Criteria to progress includes Patient progressing with decreased pain and edema, patient progressing with AROM, patient is comfortable with full weight bearing.
		• Mild pain and edema associated with increased activity
		• Limited AROM and strength
		• Asymmetrical proprioception and limited gait on uneven surfaces
			• Continue interventions as in phase I and II
			• Progress to standing heel raises as indicated
			• Pain-free double and single leg Total Gym squats
			• Pain-free forward treadmill
			• Pain-free forward lunges
			• 4-way hip exercise on involved extremity
			• Begin proprioceptive/balancing activities
			  ○ Unilateral balancing
			  ○ Rocker board with bilateral stance

			○ BAPS Board, progress from seated to bilateral standing, then unilateral
Phase IV **Rehabilitation Phase** **Weeks 20+**	• Maximize quality of gait • Discharge to independent home exercise program • Return to occupation/sport	• Criteria to Progress to this Phase includes good progression through previous phases with need to return to higher-level, pain free with ambulation over flat ground, Normal ROM and strength • Limited strength and decreased proprioception • Limited tolerance to higher-level occupational/sporting activities	• Continuation of exercises from phases I-III as indicated • Initiate appropriate intensity of occupational/sport specific activities • Progress 4-way hip exercises with stance foot on unstable surface • Progress proprioceptive/balancing activities as appropriate ○ Unilateral balancing (eyes open/closed/catching ball) ○ Slide board ○ Shuttle leg press • Progress with functional training as appropriate ○ BOSU balance activities ○ High level unilateral balance ○ Box drills ○ Figure 8 drills

Ankle Arthroscopy with Talus OCD Microfracture

Post Op	Goals	Precautions	Exercises
Phase I **Weeks 0-1**		• NON weightbearing • Splint immobilization • Daily icing, compression and elevation home program	
Phase II **Weeks 1-3**	• Will place into CAM boot after first post operative visit. May remove for hygiene and exercises. • Normalize gait pattern	• Continue NON weightbearing for 6 weeks with crutches	• Modalities as indicated • Early GENTLE non-weightbearing ROM as tolerated • Daily HEP to include elevation, compression, and icing

Phase III
 	
Weeks 3-6
		• Continue NON-weightbearing activities with crutches	• Advanced ROM exercises
			• Therapeutic Exercises (Non-weightbearing)
			  ○ Ankle isometric strengthening exercises
			  ○ Foot intrinsic strengthening

Phase IV
 	
Weeks 6-8
	• Should be able to fully weight bear and wean crutches off by 8 weeks	• May advance weightbearing as tolerated	• Advanced ROM Exercises
			• Therapeutic Exercises
			  ○ Ankle isometric strengthening exercises
			  ○ Foot intrinsic strengthening
			  ○ Balance and proprioception exercises
			  ○ Stationary biking/swimming
			  ○ Begin 4-plane theraband strengthening

Phase V
 	
Weeks 8-12
	• Should have full range of motion	• Weightbearing as tolerated	• Therapeutic Exercises
			  ○ Continue and advance ankle strengthening exercises
			  ○ Evaluate for any core and hip weakness and treat accordingly
			  ○ Begin double leg squats, claf raises, and toe raises
			  ○ Progress to single leg squats, calf raises, and toe raises
			  ○ Advance balance and proprioception exercises
			  ○ Initiate elliptical trainer and treadmill walking as tolerated, then straight plane jogging
			  ○ Control lateral agility work
			  ○ Modalities as indicated
			  ○ Daily HEP

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Post Op	Goals	Precautions	Exercises
Phase VI **Maintenance Phase**	• Phase out supervised rehab		• Advanced single leg balance and proprioception exercises • Progress lateral agility exercises and advanced agility drills • Functional activity/sports-specific training • Advance home strengthening program to be done daily • Encourage maintenance gym work-outs focusing on ankle stabilization, core and hip strengthening
Criteria for Return to Sports / Full Activities		• Full Function Range of Motion • No pain or swelling with functional activities • Good core control and balance / proprioception	

Modified Broström-Gould Repair for Chronic Lateral Ankle Instability

Post Op	Goals	Precautions	Exercises

Phase I
 	
Immediate Post Op Phase
 	
0-2 Weeks
 	
Criteria for Progression to Phase II
	• Edema Control/Reduction
	• Protect healing tissue (ankle is likely placed into immobilizing device which may include pneumatic walking boot or Short Leg Case (SLC))
	• Independent transfers and ambulation using appropriate assistive device (especially with weight bearing restrictions)
	• Prevent secondary deconditioning
	
	• Decreased pain
	• Decreased edema
	• Independence with home exercise program
	• Independence with transfers and ambulation with appropriate weight bearing precaution
		• Weight bearing restrictions
		  ○ Non-weight bearing (NWB) with short leg cast or pneumatic walking boot unless otherwise indicated
		• ROM Restrictions
		  ○ Avoid AROM / AAROM / PROM into inversion
		  ○ Avoid AROM / AAROM / PROM into plantarflexion
			• Proximal lower extremity (LE), upper extremity (UE) and trunk muscle strengthening as indicated
			• Monitor wound healing and consult with referring MD is signs and symptoms of infection are present
			• Modalities for pain/edema control (eg. Game Ready, elevation, ice, etc.)
			• Aerobic upper body conditioning
			• Transfer and gait training with optimal assistive device (if applicable)
			• Identify patient's goal for return to recreational and/or sport specific activities

Phase II
 	
Early Rehabilitation
 	
2-6 Weeks
	• Edema control/reduction
	• Protect healing tissue
	• Progress weight bearing using appropriate assistive device as indicated (take into account operative technique and associate pathologies)
	• Prevent secondary deconditioning
		• Activity Restrictions
		  ○ Limited prolonged standing / walking
		  ○ Limited driving until:
		  ▪ Right leg is no longer in pneumatic walking boot (if right leg is operative side)
		  ▪ Ability to use right leg effectively to brake in an emergency
		  ▪ Patient is no longer using narcotic pain medication
		  ▪ Patient feels comfortable and confident in driving ability
		  ▪ MD and/or PT have no further concerns with driving ability
		• Weight bearing restrictions
		  ○ ABAT in pneumatic walking boot or SLC unless otherwise indicated
		• ROM restrictions (next page)
			• Proximal LE, UE, and trunk muscle strengthening as indicated
			• Aquatic therapies / Upper body aerobic conditioning
			• Transfer and gain training with optimal assistive device
			• Modalities for pain/edema control (eg. Game Ready, elevation, ice, etc.)
			• Begin gentle and controlled ROM exercises within post-operative precautions
			  ○ Note: ROM is not equivalent to stretching
			  ○ Stretching should be avoided in phase II
			• Submaximal ankle isometrics in all directions excluding inversion

		○ Limit ~~AROM / AAROM~~ / PROM into eversion to 10° in safe controlled manner. ○ No inversion AROM / AAROM / PROM ○ Gentle and controlled AROM / AAROM / PROM into plantarflexion	
Criteria for progression to phase III	• Decreased pain • Decreased edema • Independence with home exercise program (HEP) • Independence with transfers/ambulation using assistive devices (if applicable)		
Phase III **Late Rehabilitation** **6-10 Weeks**	• Progressive protected normalization of gait. After the initial 6 week immobilization in pneumatic walking boot patient will begin transition to protected ankle weight bearing in a commercially available semi-rigid stirrup orthotic or independent ambulation without bracing. • Edema control and patient education regarding skin checks with use of bracing • Pain reduction • Improve conditioning • Prevention of scar adhesion and myofascial restriction • Restore AROM • Begin controlled strengthening exercises • Improve balance	• Weight bearing restrictions ○ Weight bearing as tolerated (WBAT) • ROM Restrictions ○ Avoid inversion AROM / AAROM / PROM until week 9	• Progressive weight bearing as tolerated • Gait training including use of appropriate assistive device and/or ankle orthotic as indicated • AROM / AAROM / PROM exercises as indicated • AROM / AAROM / PROM exercises as indicated • Joint mobilizations as identified by surgeon, adhering to identified precautions and avoiding the tensioning of the CFL and ATFL • Protected ankle strengthening exercises • Gastrocnemius and soleus stretches as indicated • Soft tissue mobilization as indicated • Continued proximal muscle strengthening activities within precautions • Proprioception activities within surgical precautions • Supplemental strengthening including leg press, bicycle and knee extensions • Aquatic therapies/Upper body aerobic conditioning
Criteria for progression to Phase IV	• Restoration of symmetrical gait pattern without use of assistive device • Strength within 90% of unaffected side (using isokinetic or isometric		

	strength measures ie. Biodex, hand held dynamometry, manual muscle testing, etc.)		

Phase IV
 	
Return to Function
 	
10-14 Weeks
 	
Criteria for Progression to Phase V
	• Restore full AROM no later than week 12
	• Reduction of post-activity edema
	• Normalize gait pattern on stable / unstable surfaces
	• Return to step through pattern for stair ascent/descent (if applicable)
	• Strengthening of ankle muscle groups
	• Restore functional strength
	
	• Return of 90% of function of the ankle compared with unaffected side measured with assessments that include, but are not limited to:
	  ○ Single leg hop for distance
	  ○ Triple hop for distance
	  ○ Star excursion balance test
	  ○ Y-Balance Test
		• Activity Restrictions
		• Return to plyometric activities (including jogging, jumping, hopping etc.) should not occur until 11 weeks post-operative and patient can perform 25 unilateral heel raises without pain or difficulty
			• AAROM / AAROM / PROM exercises as indicated
			• Modalities as indicated for edema/pain control
			• Unilateral weight bearing ankle strength exercises
			• Bilateral and unilateral weight bearing and proprioceptive and balance exercises
			• Functional lower kinetic chain strength exercises

Phase V **Return to Sport / Recreation** **Approximately 12 Weeks to 4 Months**	• Prepare for return to recreation / sporting activities and/or high level work tasks • Guide return to competitive play	• Running can be initiated when patient is able to perform straight plane jogging without pain. ○ See “Running Injury Prevention Tips & Return to Running Program” • Post activity soreness can be used as a guideline for return to sport or recreational activity	• Continued functional strengthening as needed • Continued plyometric exercises as needed • Jogging/Running • Aerobic conditioning • Agility exercises • Sport specific drills/work related training

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Posterior Tibial Tendon Surgery (FDL Transfer and Calcaneal Osteotomy)

Post Op	Goals	Precautions	Exercises
Post Op **Week 0-6**	• Pain Management • Prevent Swelling	• Immobilized in equinus and varus • Crutches – non weight bearing (NWB)	• Active Range of Motion hip and knee • Wiggle toes • Straight leg raises (SLR) x 4 directions • Short arc quad (SAQ) • Upper body exercises (seated or bench only – no pushups) • LE stretches – Hamstring, quads, ITB, hip flexors • Elevation
Week 6 – 8	• Minimize atrophy		• Cam walker • Crutches – weight bearing as tolerated (WBAT), D/C when gait is normal • Continue appropriate previous exercises • Isometrics x 4 directions
Weeks 8 – 10	• Full DF / PF • No adhesions		• Cam walker – full weight bearing (FWB) • Continue appropriate previous exercises • Scar massage / mobilization with oil/cream • Ankle AROM – Calf pumping, alphabet, rotations • Light Theraband ex x4 • Towel crunches and side to side • Steamboats (Theraband x 4 while standing on involved LE) in cam walker • Mini-squats, Wall squats, Total gym • Proprioception ex – Double leg BAPS • Gastroc / Soleus stretching

Weeks 10 - 16	• Normal Gait
	• Symmetrical ROM
			• Transition from cam walker to ankle brace
			• Continue appropriate previous and following exercises without brace
			• Strengthening ex, emphasize medial ankle mm
			  ○ Theraband with increasing resistance
			  ○ Elgin

Months 4 - 6	• Normal Strength • Walk 2 miles at 15 min/mile pace		• Continue ankle brace and appropriate previous exercises • Single leg heel raises • Fitter, side board • Treadmill – Walking progression program • Elliptical trainer • Stairmaster

Months 6 - 9	• Return to all activities	• NO CONTACT SPORTS UNTIL 9 MONTHS POST OP	• D/C brace • Continue appropriate previous exercises • Pushup progression • Sit-up progression • Treadmill – Running progression program • Agility drills / Plyometrics • Transition to home / gym program

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Achilles Tendon Repair with FHL/FDL Tendon Transfer

Post Op	Goals	Precautions	Exercises
Phase I **Start 6 Weeks Post Op**	1) Visit 1 Evaluate Patient		• Begin Ankle ROM Exercises: AROM, alphabet, and ankle circles. • Gait Training, in CAM walker WBAT with heel wedges. Remove 1 wedge weekly. • Ice ankle and use compressive stockinette for edema control, and educate patient on icing at home.
	2) Visit 2 and 3	• Caution in over-stretching the repair into excessive DF beyond neutral to 5 degrees in the first several weeks, not to exceed 10 degrees by week 10, full symmetric DF by 12 to 14 weeks post-op.	• Continue with ankle ROM exercises as needed (full ROM should be achieved by 10 weeks post-op. • Begin gentle ankle strengthening including manual resistance exercises, 4-direction theraband exercises, and seated DF/PF. • Begin proprioceptive exercises such as the seated BAPs board. • Begin aerobic conditioning such as the bike.
	3) Visits 4 and 5		• Progress the strengthening exercises to include the leg press in CAM Walker. • Address additional strengthening deficits of the involved extremity using machines that may include knee extension machine, hamstring curl machine and multi hip machine.
Phase 2 **8 to 12 weeks Post Op**	4) Visits 6 and 7		• Begin progressive weight bearing without the CAM walker, with the use of heel lift. • Discontinue use of CAM walker in therapy. • Begin weight bearing proprioceptive exercises on static and dynamic surfaces to include single limb stance exercises, plyoball, and 4 way theraband exercises standing on involved limb. • Address additional gait deficits and abnormalities. • Advance strengthening activities to include standing heel raises, squats, lunges, and step-ups.
	5) Visits 8 and 9		• Continue exercise progression with increased weight bearing with activities in single limb stance and with additional weight. • Advanced aerobic conditioning to include the treadmill, stepper, etc.

Phase 3 **14+ Weeks Post Op**	6) Visits 10 and 11	• Begin sports specific training with sport cord activities including lunges and semicircles. • Progress difficulty of proprioceptive exercises done on dynamic surfaces only.
	7) Visits 12,13, and 14	• Begin hopping and jumping drills and other plyometric training for return to sports as appropriate. • Begin running based on MD clearance. • Discharge with HEP (to include goal of single heel raise by 6 to 12 months post-op).
Discharge Criteria **10-14 Visits**	1) Normal gait without assistive device or bracing 2) Minimal to no pain with ADLs 3) Minimal to no joint effusion 4) Adequate neuromuscular control and proprioceptive awareness based on ability to perform stabilization exercises and ability to participate in recreational / sport activities	

Ankle Arthroscopy Post Surgical

Post Op	Goals	Precautions	Exercises
Post Op **Days 1 – 10**	• Pain Management • Prevent Swelling	•	• L&U Splint – Watch for skin breakdown • Crutches – non weight bearing (NWB) • AROM hip and knee • Wiggle Toes • Straight leg raise (SLR) x 4 • Short arc quad (SAQ) • Upper body exercises (seated or bench only – no pushups) • LE stretches – Hamstring, quads, ITB, Hip flexors • Ice and Elevation
Days 10 – 21	• Full Range of Motion • Normal Gait		• Crutches – weight bearing as tolerated (WBT), D/C when gait is normal • Continue appropriate previous exercises • Calf pumping, alphabet, rotations • Light Theraband ex x 4 • Towel crunches and side to side • Seated BAPS, progress to double leg in standing • Stationary bike • Gastroc / Soleus Stretching • Ice as needed
Weeks 3-6	• Normal strength		• Continue appropriate previous exercises • Theraband ex x 4 – Gradually increase resistance • Steamboats (Theraband x 4 while standing on involved LE) • Mini-squats, Wall squats, Total gym • Double leg heel raises – Progress to single leg heel raises • Single leg BAPS, ball toss, and body blade • Forward, retro and lateral step downs • Knee extension and HS curl weight machines • Proprioception ex – Single leg BAPs, ball toss, body blade • Treadmill – Walking forwards and backwards • Elliptical trainer • Pool therapy – Chest or Shoulder deep water running

Weeks 6 – 8	• Walk 2 miles at 15 min / mile pace	• Continue appropriate previous exercises • Leg press and hip weight machine • Fitter, side board • Push-up progression • Sit-up progression • Treadmill – Walking progression program • Stairmaster • Pool Therapy – Ultrasound
Months 2 - 4	• Return to all activities	• Continue appropriate previous exercises • Running progression program • Agility drills / Ploymetrics • Transition to home/gym program

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Achilles Tendon Repair

Postop	Goals	Precautions	Exercises
Weeks 0-2 **PT 1-2x/week** **HEP daily**	Edema and pain control Protect surgical repair	NWB with assistive device Immobilization in splint Brace- patient in plantarflexion	No formal PT
Weeks 2-6 **PT 2-3x/week** **HEP daily**	DF- neutral Good weight acceptance on involved LE Discontinue crutches by **week 6**	50 % WB in CAM boot Active dorsiflexion, passive plantarflexion, ankle ROM NWB>PWB>WBAT CAM boot donned at all times Gradual removal of wedges **at 4 weeks** postop (No wedges Dr. Skalak)	Gait training Isometrics (DF, PF, Inv, Ever) Seated heel raise Initiate resistance bands Seated BAPS Soft tissue mobilization/ scar massage/ desensitization
Weeks 6-12 **PT 2-3x/week** **HEP daily**	Weight bearing in shoes Normalized gait pattern Ascend 8" step	WBAT at **6 weeks** if incision healed DC CAM boot- per MD direction Avoid aggravating activities No running or sport	Continue ROM Stationary bike through heel until 8 weeks Step ups, lateral step ups Mini squats Proprioceptive training Standing heel raises at 8 weeks Leg press
Weeks 12-16 **PT 1x/week** **HEP daily**	Progress strength, balance, and gait Return to ADLs	Begin light jogging (**14-16 weeks**) Avoid aggravating activities	ROM/stretching Achilles as needed, other LE muscles Gait: Ensure good gait pattern SLB activities Progress to multiple planes Ankle theraband Begin functional strengthening exercises Leg press - bilateral Leg press calf press (bilateral, progress to unilateral) Progress to WB bilateral calf raises Proprioception activities – i.e. BAPS, balance board Hip and knee PRE's Soft tissue and joint mobs as needed Stairmaster, bike for cardio Lunges Forward running (**14-16 weeks**) Plyometric training
Weeks 16-20 **HEP daily**		Increased running (week 20) Avoid aggravating activities	Progress hip and knee exercises Progress to WB unilateral calf raises Stairmaster Isokinetics for ankle (inv/ev, DF/PF) – optional

	Criteria to progress: ROM equal to opposite side Perform 20 unilateral toes raises (full range, pain-free) Perform bilateral jumping in place 30 seconds each F/B, L/R with good technique	Begin jumping progression: leg press, min-tramp, ground) Functional rehab Forward dips multiple plane for balance Begin light plyos
5-6 Months		Progress previous exercises Progress jumping to hopping Begin jogging/running when hopping is performed with good technique Sport specific drills for appropriate patients

Criteria to discharge non-athletes:

- Good gait pattern
- ADL's without difficulty
- Gastroc/soleus 4+ - 5/5 strength

Criteria to discharge athletes:

- Good gait pattern
- Patient performs the following tests within 80% of the uninvolved leg:
- Hop for distance
- Single leg balance reach
- Isokinetic strength test
- Maintenance program should stress continued strength and endurance work at least 2-3 times per week.