Achilles Tendon Non-Operative Rehabilitation	**Rehab Protocol** **Aaron Vandenbos, MD** 
PHASE 1: Generally 0-2 Weeks – Maximum Protection Phase	
GOALS:	1) Protect the Achilles Tendon 3) Attain DF ROM to neutral at 6 weeks post-op 4) Minimize pain, swelling, muscle atrophy, and deconditioning 5) Independent gait without assistive device
PRECAUTIONS:	- NWB - No AROM or PROM to ankle
BRACE/CRUTCHES:	Weeks 0-2: NWB with appropriate Assistive device; CAM boot or casted with foot in 20° PF
REHABILITATION:	Keep LE elevated as much as possible; ice ankle when applicable - Begin exercises listed below
˜ Weeks 0-2:	- Hip and knee AROM exercises - Quad sets and glute sets - Knee and hip supine/seated open kinetic chain (OKC) strengthening exercises as tolerated (i.e. SLRs, LAQs, and SAQs) - HS stretching
FOLLOW-UP:	- Supervised rehab: 1-2x per week - PT re-eval: every 2-4 weeks as needed - Ortho re-eval: 2 weeks

PHASE 2: Generally 2-6 Weeks – PROM/AROM Phase	
GOALS:	1) Protect integrity of Achilles 2) Minimize Effusion 3) Progress ROM per guidelines 4) Progress WB in walking boot
PRECAUTIONS:	- DF to neutral - Inversion & eversion below neutral DF
BRACE/CRUTCHES:	Walking boot with 2-4cm heel lift (no change in heel lift height until 6 weeks) Weeks 2-3: 25% WB Weeks 3-4: 50% Weeks 4-5: 75% Weeks 5-6: 100% NOTE: May progress earlier based on Ortho preference
REHABILITATION:	- Continue Phase 1 exercises as needed - Progress to the following exercises and increase intensity gradually when patient is ready (i.e. no increase in knee pain or effusion since the previous exercise session)
˜ Weeks 3-4:	- Grade I-III joint mobilizations

	- Active PF and DF to neutral, Ankle ROM exercises (i.e. ankle pumps, alphabets, and CW/CCW circles) - Ankle sub-max isometrics as tolerated - Intrinsic foot strengthening/toe posture and short foot exercises (towel crunches, marble pick-ups) - Core strengthening - NWB Cardio: deep water running, UBE for aerobic strength/endurance and seated UE weight lifting - Knee and hip supine/seated OKC strengthening exercises as tolerated (i.e. resisted knee extensions, HS curls, and hip strengthening) - LE stretching: HS, glutes, ITB, piriformis, and quads - OKC proprioceptive exercises - Manual Therapy: ankle/foot mobilizations as needed; limit DF to 0°
˜ Weeks 5-6:	- Low intensity stationary bike with no resistance (5-10 minutes) - Pain-free ankle isometrics - Seated Heel raises: DL to SL (from neutral to PF as tolerated) once splint is removed (i.e. 50-100 reps, 5-6x per day); add NMES with seated heel raise as needed - AAROM self-mobs for PF - Manual Therapy: ankle/foot mobilizations as needed; limit DF to 0° until 6 weeks post-op - Beginner-level pool exercises - Chest-deep water walking and exercises (within precautions)
FOLLOW-UP:	- Supervised rehab: 1-2x per week - PT re-eval: every 2-4 weeks as needed - Ortho re-eval: 6 weeks

PHASE 3: Generally 6-8 Weeks – Progressive Stretching & Early Strengthening	
GOALS:	1) FWB in boot 2) Gradual Strengthening of ankle 3) ROM to tolerance
PRECAUTIONS:	- No impact activities - Avoid going past neutral DF in weight-bearing - Gradual active assisted DF stretching
BRACE:	- WBAT in walking boot - Gradually remove a heel lift section every 3-7 days
REHABILITATION:	- Continue Phase 2 exercises as needed - Progress to the following exercises and increase intensity gradually when patient is ready (i.e. no increase in knee pain or effusion since the previous exercise session)
˜ Weeks 6-8:	- Ankle strengthening with light tubing all directions as tolerated - Stationary bike in CAM boot with light resistance - Gait training in boot - Progress resisted exercises from CKC to OKC; maintain neutral DF in WB
FOLLOW-UP:	- Supervised rehab: 1-2x per week - PT re-eval: every 2-4 weeks as needed - Ortho re-eval: 6 weeks
TESTING:	- Achilles tendon total Rupture score (ATRS)

PHASE 4: Generally 8-12 Weeks – Terminal Stretching & Progressive Strengthening	
GOALS:	1) Protect integrity of Achilles 2) Wean from CAM boot (within 5-7 days) 3) Normalize Gait 4) Achieve full ROM
PRECAUTIONS:	- No impact activities - Period of highest risk of re-rupture - Avoid any sudden loading of the Achilles (ie tripping, step-up stairs, running, jumping, hopping, etc.) - No eccentric lowering of plantar flexors past neutral - No resisted plantar flexion exercises which requires more than 50% BW - Avoid activities that require extreme DF motion
BRACE:	- WBAT in normal shoe - Gradually remove a heel lift section every 3-7 days - Ankle brace as needed
REHABILITATION:	- Continue Phase 3 exercises as needed - Progress to the following exercises and increase intensity gradually when patient is ready (i.e. no increase in knee pain or effusion since the previous exercise session)
˜ Weeks 8-10:	- Gentle calf stretches in standing - Continue multi-plane ankle stretching - Seated heel raise - Seated BAPS/rocker board - Progress multi-plane ankle strengthening with Thera-band - Proprioceptive training - Progress resistance on stationary bike - Continue Gait training to normalize gait
˜ Weeks 10-12:	- Gradually introduce elliptical and treadmill walking - Progress to double heel raise on leg press to standing. Do not allow ankle to go past neutral DF and no more than 50% of pt's body weight. - Supported standing BAPS/rocker board
FOLLOW-UP:	- Supervised rehab: 1-2x per week - PT re-eval: every 2-4 weeks as needed - Ortho re-eval: 12 weeks
TESTING:	-Achilles tendon total Rupture score (ATRS) Y-balance testing

PHASE 5: Generally 3-5 Months – Progressive Stretching	
GOALS:	1) Return to function
PRECAUTIONS:	- High risk of re-rupture - Avoid activities that require extreme DF motion - No running, hopping or high eccentric loading
BRACE:	- WBAT in normal shoe - Wean from ankle brace
REHABILITATION:	- Continue Phase 4 exercises as needed - Progress to the following exercises and increase intensity gradually when patient is ready (i.e. no increase in knee pain or effusion since the previous exercise session)
˜ Weeks 12-16:	- Increase intensity of cardiovascular program - Cycling outdoors

	- DL to SL heel raise to 50% body weight to eccentric strengthening as tolerated - Continue to progress intensity of resistive exercises progressing to functional - activities (single leg squats, step-up progressions, multi-directional lunges) - Begin multi-directional resisted cord program (side stepping, forward, backward, grapevine) - Initiate impact activities: sub-maximal bodyweight (pool, GTS, plyo-press) - Advanced proprioceptive training on unstable surfaces with dual tasks
˜ Week 16:	- Initiate pool running - Maximal body weight impact activities as tolerated
FOLLOW-UP:	- Supervised rehab: 1-2x per week - PT re-eval: every 2-4 weeks as needed - Ortho re-eval: 6 weeks
TESTING:	- Achilles tendon total Rupture score (ATRS) - Endurance Heel rise test (Lunsford et al) - Y-balance testing

PHASE 6: Generally 5-8 months – Terminal Stretching & Progressive Strengthening	
GOALS:	1) Return to sport 2) Progressive running, hopping, agility training
PRECAUTIONS:	Progress return to duty/sport as cleared by testing and physician
REHABILITATION:	- Continue Phase 5 exercises as needed - Progress to the following exercises and increase intensity gradually when patient is ready (i.e. no increase in knee pain or effusion since the previous exercise session)
˜ Months 5-6:	- Initiate running on flat ground - Progress proprioception - Sport-specific rehab - Progress eccentric PF strengthening
˜ Months 6-8:	- Initiate hill running - Initiate hopping and progress to long horizontal and vertical hops - Return to sport testing per physician approval - Criteria: pain-free, full ROM, minimal joint effusion, 5/5 MMT strength, jump/hop testing at 90% compared to uninvolved, adequate ankle control with sport and/or work specific tasks
FOLLOW-UP:	- Supervised rehab: 1-2x per week - PT re-eval: every 2-4 weeks as needed - Ortho re-eval: as needed
TESTING:	- Endurance Heel rise test (Lunsford et al) - Achilles tendon total Rupture score (ATRS)
DISCHARGE GOALS:	- Hop test and Y-balance limb symmetry > 90% - Isokinetic testing limb symmetry > 85% - Full return to sports/athletics and military training without limitations
MISCELLANEOUS:	- After 6 months: Exercises in Phase 6 are continued, gradually increasing intensity & duration as tolerated. - The recommendation is to wait until 6 months post-injury to return to contact/collision sports or aggressive military training. This time period may be adjusted slightly by the physician and therapist according to patient progress.

These guidelines were created as a framework for the post-operative rehabilitation program. They DO NOT substitute for any specific restrictions or requirements that are determined through the necessary shared decision-making and collaboration between the operating surgeon and treating rehabilitation team.