Delaware Physical Therapy Clinic

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Rehab Practice Guidelines for:

Achilles Tendon Repair

Expected # of visits: 20-27

Precautions and Comments	
Precautions	▪ NMES tendon gliding: ○ Prone with knee resting in >50˚ of flexion and ankle in full plantarflexion. ○ Pad placement - medial and lateral gastrocnemius ○ 2,500 HZ modulated at 75 bursts per second ○ 2 second ramp time ○ 10 on / 50 second off ○ 10-15 contractions
Comments	▪ Time of initiating physical therapy varies by MD so please adjust the protocol accordingly to the patients' arrival in therapy. Also, heel lift removal is also MD dependent and communication with the MD should be made to determine the preferred protocol.

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Achilles Tendon Repair Rehab Protocol

Timeline	Treatment	Milestones
Days 0-10	▪ No Therapy	▪ Weight bearing as tolerated on crutches immobilized per MD with 3 heel lifts
Day 10–Week 4 ▪ Begin PT ▪ 3 visits/week Total Visits: 9	▪ Remove one heel lift from rigid boot at first visit. ▪ PROM and stretching for ankle PF, Inversion, and Eversion. ▪ AROM exercises for all ankle motions. ▪ PRE's for Inversion, Eversion, and DF to neutral. ▪ Seated BAPS (progress level as PROM progresses) limiting DF to neutral. ▪ Joint mobilizations: talo-crural; subtalar; and distal tibio-fibular for maintenance of accessory motions as needed. ▪ Scar mobilization. ▪ NMES - tendon glide protocol. ▪ Gait training with boot to minimize deviations with discharge of crutches.	▪ Full PROM for ankle PF, Inversion, and Eversion. ▪ Full joint mobility for talo-crural, subtalar, and distal tibio-fibular joints. ▪ Able to activate muscle contraction for ankle invertors, evertors, dorsiflexors, and plantarflexors. ▪ Ambulation full weight bearing in rigid boot with two heel lifts without assistive device
Week 4-6 Total Visits: 10-15	▪ PRE's for PF with tubing for more resistance with the knee flexed. This can be done with knee straight but limit DF ROM to neutral ▪ Begin exercise bike. ▪ Weight shifting exercises on floor ▪ Manual passive stretching for DF with the knee flexed only ▪ Gait training in the clinic in athletic shoes with bilateral heel lifts. ▪ Remove the second heel lift from rigid boot at week 4 ▪ Able to Run in chest deep water if a pool is available	Week 4 ▪ Ambulate short distances in the clinic in athletic shoes with bilateral 1/4-inch heel lifts. ▪ DF (gastroc) to neutral measured in subtalar joint neutral (STJN) prone Week 6 ▪ Ambulate in athletic shoes with 1/4-inch heel lifts without assistive device. ▪ Full DF PROM with gastrocnemius shortened by flexing the knee
Weeks 8-11 ▪ 2 visits/week Total Visits 14-23	▪ Begin heel raises, bilateral and progress to unilateral. ▪ Single leg standing balance exercises; progress from floor to trampoline. ▪ Lateral step-ups for dorsiflexion motion. ▪ Gastroc stretching to within 5° of uninvolved side when measured in STJN ▪ Standing BAPS if patient has adequate control in sitting ▪ @ week 11 remove heel lifts in shoes ▪ If patient meets 10-week criteria begin ○ Bilateral rebounding heel raises in place ○ Bilateral Jump in place ○ Trampoline Jogging Slow 30 seconds on 30 second rest x 5 minutes. ○ Walk/Fast walk progression: see end of protocol	▪ Unilateral heel raise. ▪ Normal gait w/o heel lift in shoes. ▪ Use of stairs foot over foot w/o deviation. ▪ Independent with home program focusing on gastroc-soleus strengthening, and endurance ▪ DF (gastroc) measured in STJN in prone within 5° of uninvolved @ week-10 ▪ If able to perform 5 heel rises at 90% of available heel rise height ▪ Begin bilateral rebounding heel raise, bilateral hops in place, and begin gentle jogging on a trampoline ▪ Begin Walk/Fast walk progression

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Weeks 12-15 ▪ 1 visit/week Total Visits: 23-27	▪ Continue exercises at home and fitness facility with focus on gastroc-soleus strengthening and flexibility (if needed). ▪ Do not stretch gastrocnemius once DF (gastroc) equal to the opposite side in STJN ▪ Add criterion-based exercises as long as patient meets criteria ▪ Run on treadmill. ▪ Running Progression on Treadmill: see end of protocol	▪ Equal DF (gastroc) compared to opposite side measured in STJN in prone @ 12-13 week ▪ Must be 12 weeks or greater and achieve 10-week criteria ○ Begin the UD Running progression @ 14-15 weeks if unable to achieve 5 heel rises at 90% of available heel rise height, but can raise 70% of their bodyweight using a scale ○ Begin bilateral rebounding and gentle jogging ○ Begin Walk/Fast walk progression
Weeks 16-20 ▪ Recheck as needed	▪ Follow up to review home program and running progression. ▪ Progressive return to activity. ▪ Agilities can be added ▪ Continue Plyometric Training Bilateral to Unilateral	@ 16-20 Weeks ▪ If able to perform 85% of uninvolved number of heel rises or > 25-30 reps ▪ Begin progressive return to non-contact sports
Weeks 21-24 ▪ Recheck as needed	▪ Begin progression to contact sports with independent program as long as patient has met all previous milestones and has performed their home exercises/gym program without swelling or pain. ▪ Discharge from skilled PT	@ 21-24 Weeks ▪ If able to perform 90% of uninvolved number of heel rises or > 30 reps ▪ Begin progressive return to contact sports

Heel Rise Test[1]

- Utilize the heel rise testing box – performed one leg at a time standing on a box with a 10° incline
- Patient is allowed to place two fingertips per hand at shoulder height against the wall for balance
- Originally written with a metronome set for 30 rises per minute, if one is not available, this could be left out and a heel rise can be performed on command 1 every 2 seconds.
- Patient is to first perform one unilateral heel rise on each side, measuring the heel rise height difference.
- Calculate 90% of the heel rise and set the marker on the box at this level
- The patient is instructed to begin performing as many heel rises as possible.
- Each heel rise at or above 90% of their max heel rise height is counted as a repetition
- The test is terminated when either the patient stops, frequency is not maintained with the metronome or one every 2 seconds or was unable to perform a proper heel rise.
- The max heel rise height, the 90% mark, and the total number of heel rises are documented for both sides.

Fast Walk and Running Progression

- Continue from treadmill to the track, to flat road/field running/walking, and finally hill running/walking. Program advancement is dependent on the return of balance, agility, and the ability to run or fast walk 2 miles at each level without pain or swelling. Full progression can take as long as 3 months. Follow the below instructions and soreness rules for each.

Instructions

- Mandatory 2-day rest between workouts for first two weeks.
- Do not advance more than 2 levels per week.
- Two days rest mandatory between levels 1, 2, and 3 workouts.
- One day rest mandatory between levels 4-8 workouts.

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Soreness Rules

- If sore during warm-up, take 2 days off and drop down 1 level.
- If sore during workout, take 1 day off and drop down 1 level.
- If sore after workout, stay at same level.

Treadmill Fast Walking Program

LEVEL 1	0.1-mile walk / 0.1-mile fast walk- repeat 10 times
LEVEL 2	Alternate 0.1-mile walk / 0.2-mile fast walk - 2-mile total
LEVEL 3	Alternate 0.1-mile walk / 0.3-mile fast walk - 2-mile total
LEVEL 4	Alternate 0.1-mile walk / 0.4-mile fast walk - 2-mile total
LEVEL 5	Fast walk 2 miles
LEVEL 6	Increase workout to 2 1/2 miles
LEVEL 7	Increase workout to 3 miles

Track Fast Walking Program

LEVEL 1	Fast Walk straights / Walk curves - 2 miles total
LEVEL 2	Fast Walk straights / Fast Walk 1 curve every other lap
LEVEL 3	Fast Walk straights / Fast Walk 1 curve every lap
LEVEL 4	Fast Walk 1 3/4 lap / Walk curve
LEVEL 5	Fast walk all laps
LEVEL 6	Increase workout to 2 '/z miles
LEVEL 7	Increase workout to 3 miles
LEVEL 8	Increase speed on straights / Jog curves

Treadmill Running Program

LEVEL 1	0.1-mile walk / 0.1-mile jog- repeat 10 times
LEVEL 2	Alternate 0.1-mile walk / 0.2-mile jog - 2-mile total
LEVEL 3	Alternate 0.1-mile walk / 0.3-mile jog - 2-mile total
LEVEL 4	Alternate 0.1-mile walk / 0.4-mile jog - 2-mile total
LEVEL 5	Jog 2 miles
LEVEL 6	Increase workout to 2 1/2 miles
LEVEL 7	Increase workout to 3 miles
LEVEL 8	Alternate between running /jogging every 0.25 miles

Track Running Program

LEVEL I	Jog straights / Walk curves - 2 miles total
LEVEL 2	Jog straights / Jog 1 curve every other lap
LEVEL 3	Jog straights / Jog 1 curve every lap
LEVEL 4	Fast Walk 1 3/4 lap / Walk curve
LEVEL 5	Jog all laps
LEVEL 6	Increase workout to 2 '/z miles
LEVEL 7	Increase workout to 3 miles
LEVEL 8	Increase speed on straights / Jog curves

References

1. Silbernagel, Karin G., Katarina Nilsson-Helander, Roland Thomee, Bengt Eriksson, and Jon Karlsson. "A new measurement of heel-rise endurance with the ability to detect functional deficits in patients with achilles tendon rupture." A new measurement of heel-rise endurance with the ability to detect functional deficits in patients with achilles tendon rupture 18 (2009): 258-64.

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