FOOT PLANTAR FASCIITIS NON-OPERATIVE GUIDELINE

The following Plantar Fasciitis Guideline was developed by HSS Rehabilitation. Progression is both criteria-based and patient specific. Phases and time frames are designed to give the clinician a general sense of progression but do not replace clinical judgement. This rehabilitation program emphasizes reduction of pain in the acute phase with special attention to not overstress the involved tissue. In the chronic phase the focus is on restoration of function and everyday activities. Keep in mind that the duration of symptoms, severity of injury, and the structures involved will impact the rehabilitation process. Patients may present at any phase so it is important to be familiar with all phases of the guidelines. Additionally, consider the age of the patient and whether their growth plates are still open.

Follow referring provider's modifications as prescribed

FOOT PLANTAR FASCIITIS NON-OPERATIVE GUIDELINES

Acute/High Irritability Phase

PRECAUTIONS

- Screen the patient for fractures with the Ottawa Foot and Ankle Rules
- Assess for severity of injury to supporting structures, e.g., Achilles tendon, posterior tibialis tendon, flexor hallucis longus, Baxter's nerve
- Maintain physician precautions if applicable
- Avoid over stretching irritable tissues

CONSIDERATIONS

- Age of the patient with consideration for open growth plates
- BMI
- Activity level

ASSESSMENT

- Foot and Ankle Disability Index (FADI): validated for adolescents ages 13 -17 and adults ages 18 - 64
- Numeric Pain Rating Scale (NPRS)
- Lumbar spine screen
- Lower extremity (LE) active and passive range of motion (AROM, PROM) screen with emphasis on the ankle
- LE strength screen with emphasis on the ankle
- Calf girth
- Joint mobility
    - Talocrural joint, distal tibiofibular joint, subtalar joint, mid-tarsal joints, first metatarsal phalangeal joint.
- Palpation
    - Identify pain generators
        - Differentiate from Baxter's nerve entrapment, posterior tibialis tendinopathy, Achilles tendinopathy, Sever's disease, and Iselin's disease
- Special tests
    - Tarsal tunnel test, Windlass test, navicular drop test
- Sensation testing
- Pre-injury and post-injury function

TREATMENT RECOMMENDATIONS

- Pain management
  - Protect, rest, ice, compression, elevation (PRICE), modalities
  - Activity modification
  - Heel cushion as needed
  - Taping as needed
  - Shoe recommendations
- Gait and stair training
  - Encourage symmetrical gait pattern
  - Train in use of CAM boot and assistive device if necessary
- AROM/active assisted range of motion (AAROM)/PROM of the foot and ankle
  - Do not overload involved tissues
  - Graded exposure to fearful motions
  - Focus on non-weight bearing (NWB)/limited weight bearing interventions
- Joint mobilizations: low-grade, focus on the distal tibiofibular joint, talocrural joint, subtalar joint, and first MTP joint, e.g., posterior talar glides and mobilizations with movement
- Balance/proprioception
  - Seated multi-directional rocker board
- Strengthening: foot & ankle (pain-free)
  - Isometric progress to isotonic as tolerated
    - Focusing on posterior tibialis and peroneus longus
  - Intrinsic strengthening
- Proximal LE and core strengthening

CRITERIA FOR ADVANCEMENT

- Minimize antalgic gait
- Minimal use of assistive devices during gait
- Pain controlled

EMPHASIZE

- Pain-free exercise
- Symptom management
- Limit activities which exacerbate irritable tissues

FOOT PLANTAR FASCIITIS NON-OPERATIVE GUIDELINES

Sub-Acute/Moderate Irritability Phase

PRECAUTIONS

- Avoid premature return to activity
- Avoid over stretching irritable tissues

CONSIDERATIONS

- Age of the patient with consideration for open growth plates
- BMI
- Activity level

ASSESSMENT

- FADI
- NPRS
- Lumbar spine screen
- LE AROM, PROM screen (include hallux ROM)
- LE strength screen with emphasis on the ankle
- Calf girth
- Joint mobility
    - Talocrural joint, distal tibiofibular joint, subtalar joint, mid-tarsal joints, first MTP joint
- Palpation
    - Identify pain generators
- Special tests
    - Tarsal tunnel test, Windlass test, navicular drop test
    - Heel-rise test (see Hebert-Losier reference)
- Functional movement screen
    - Squats: bilateral or unilateral depending on symptoms
    - Single leg stance (SLS) with assessment of foot tripod (calcaneus, 1st and 5th metatarsal heads)
    - Step down

TREATMENT RECOMMENDATIONS

- Pain management
    - Consider use of orthotics and night brace
    - Activity modifications
    - Shoe recommendations
    - Taping as needed
    - Self -massage with ball under arch of foot
        - Avoid plantar fascia origin
- Gait and stair training
    - Encourage symmetrical gait pattern
    - Reduce reliance on assistance device
- AROM/PROM of the foot and ankle
- Joint mobilizations: focusing on the distal tibiofibular, talocrural, subtalar joints, and first MTP joint, e.g., posterior talar glides and mobilizations with movement
- Neuromuscular training
    - Movements tracking over 1st and 2nd metatarsals
- Weight bearing balance/proprioception
    - Bilateral to unilateral stance progression
    - Static to dynamic movement progression
    - Sagittal plane to multiplanar progression
    - Level ground to compliant surfaces progression
    - Examples: multi-directional rocker board, proprioceptive foam, hemispheric balance trainer
- Strengthening: in weight bearing
    - Heel raise progression
    - Isotonic foot & ankle
    - Intrinsics
- Proximal LE and core strengthening

CRITERIA FOR ADVANCEMENT

- Normal gait pattern without assistive device
- Minimal to no pain with increasing activity

EMPHASIZE

- Exercise without increasing pain
- Tripod contact pattern of foot to floor
- Limit activities which stress irritable tissues

FOOT PLANTAR FASCIITIS NON-OPERATIVE GUIDELINES

Chronic/Low Irritability Phase

PRECAUTIONS

- Avoid premature return to activity

CONSIDERATIONS

- Age of the patient with consideration for open growth plates
- Psychosocial involvement/pain sensitization
- BMI
- Activity level

ASSESSMENT

- FADI
- NPRS
- LE AROM and PROM screen
- LE strength screen
- Joint mobility
    - Talocrural joint, distal tibiofibular joint, subtalar joint, mid-tarsal joints, first MTP
- Calf girth
- Palpation
- Functional movement screen
    - SLS
    - Unilateral squat
    - Forward step down
    - STAR Excursion Balance Test
    - Running/hopping assessment

TREATMENT RECOMMENDATIONS

- Pain management
    - Progressive return to activity
    - Consider discontinuing heel cushion and night brace
    - Consider long term use of orthotics
    - Shoe recommendations
- AROM/PROM of the foot and ankle
    - Address persisting deficits in ROM and joint mobility
- Weight bearing balance/proprioception
    - Unilateral and dynamic stabilization progressions continued
    - Multi-directional rocker board, foam, hemispheric balance trainer
    - Sport specific balance/proprioception including varying terrains
    - Perturbations
- Strengthening in weight bearing
    - Heel raise progression
    - Eccentric control
    - Increase load (reintroduce previously symptomatic movements)
    - Endurance training
- Squat variations
    - Bilateral/unilateral
- Proximal LE and core strength progression
- Running initiation & progression
- Plyometrics & agility
    - Deceleration and cutting exercises
    - Reactionary drills emphasizing directional and speed changes

CRITERIA FOR DISCHARGE

- Foot and ankle ROM within normal limits
- Ankle plantarflexor strength 90%-100% limb symmetry index (LSI) of the contralateral side measured via dynamometry and/or 20 SL heel raises on involved side (see Hebert-Losier reference for age specific norms)
- Ability to perform daily tasks and sport specific activities without increase in symptoms
- Patient appropriate functional testing, e.g., drop vertical jump, 6-minute walk test

EMPHASIZE

- Tripod contact pattern of foot to floor in high level activities
- Weight bearing stability
- Proper footwear and orthotic use
- Gait duration/distance/step count
- Activity specific training

FOOT PLANTAR FASCIITIS NON-OPERATIVE GUIDELINES

References

1. Caffrey, E.A., Docherty C.L., Schrader J. & Klossner, J.. The ability of 4 single-limb hopping tests to detect functional performance deficits in individuals with functional ankle instability. *J Ortho Sports Phys Ther*. 2009; 39(11): 799-806. doi:10.2519/jospt.2009.3042.
2. Doherty, C., Bleakley, C., Hertel, J., Caulfield, B., Ryan, J., & Delahunt, E. Recovery from a first-time lateral ankle sprain and the predictors of chronic ankle instability: a prospective cohort analysis. *Am J Sports Med*. 2016; *44*(4): 995–1003. https://doi.org/10.1177/0363546516628870.
3. Fraser JJ, Glaviano NR, Hertel J. Utilization of physical therapy intervention among patients with plantar fasciitis in the United States. *J Orthop Sports Phys Ther*. 2017;47(2):49-55. doi:10.2519/jospt.2017.6999.
4. Goff, J., Crawford, R. Diagnosis and treatment of plantar fasciitis. *Am Fam Physician.* 2011*;* 84 (6): 677-682.
5. Gribble, P.A., Hertel, J. & Plisky, P. Using the star excursion test to assess dynamic postural-control deficits and outcomes in lower extremity injury: a literature and systematic review. *J Athl Train*. 2012; 47(3), 339-357.
6. Hamstra-Wright KL, Huxel Bliven KC, Bay RC, Aydemir B. Risk factors for plantar fasciitis in physically active individuals: a systematic review and meta-analysis. *Sports Health*. 2021;13(3):296-303. doi:10.1177/1941738120970976.
7. Hebert-Losier, K., Wessman, C., Alricsson, M., & Svantesson, U. Updated reliability and normative values for the standing heel-rise test in healthy adults. *Physiotherapy*. 2017; 103(4): 446-452.
8. Huffer D, Hing W, Newton R, Clair M. Strength training for plantar fasciitis and the intrinsic foot musculature: A systematic review. *Phys Ther Sport*. 2017;24:44-52. doi:10.1016/j.ptsp.2016.08.008.
9. Koc TA Jr, Bise CG, Neville C, Carreira D, Martin RL, McDonough CM. Heel Pain - Plantar Fasciitis: Revision 2023. J Orthop Sports Phys Ther. 2023 Dec;53(12):CPG1-CPG39. doi: 10.2519/jospt.2023.0303. PMID: 38037331.
10. Martin, R.L., Chimenti, R., Cuddeford, T., Houck, J., Matheson, J.W., McDonough, C.M, et al. Achilles pain, stiffness, and muscle power deficits: midportion Achilles tendinopathy revision 2018. *J Ortho Sports Phys Ther*. 2018; 48(5): A1-A38. doi:10.2519/jospt.2018.0302.

11. Martin, R.L., Davenport, T.E., Paulseth. S., Wukich, D.K. & Godges, J.J. Ankle stability and movement coordination impairments: ankle ligament sprains. *J Ortho Sports Phys Ther*. 2013; 43(9): A1-A40. doi:10.2519/jospt.2013.0305.
12. Martin, R.L., Davenport, T.E., Reischl, S.F., Mcpoil, T.G., Matheson, J.W., Wukich, D.K., et al. Heel pain-plantar fasciitis: revision 2014. *J Ortho Sports Phys Ther*. 2014; 44(11): A1-A23. doi:10.2519/jospt.2014.0303.
13. Mills KM, Preston EB, Choffin Schmitt BM, et al. Embedding pain neuroscience education in the physical therapy management of patients with chronic plantar fasciitis: a prospective case series. *J Man Manip Ther.* 2021;29(3):158-167. doi:10.1080/10669817.2020.1821327.
14. Neufeld, S., Cerrato, R. Plantar fasciitis: evaluation and treatment. *J Am Acad Orthop Surg.* 2008; 16 (8): 338- 346.
15. Pires R., Pereira A. Ottawa ankle rules and subjective perception to evaluate radiograph necessity following foot and ankle sprain. *An Med Health Sci Res*. 2014; 4(3): 432-435.
16. Pontell D, Hallivis R, Dollard MD. Sports injuries in the pediatric and adolescent foot and ankle: common overuse and acute presentations. *Clin Podiatr Med Surg*. 2006;23(1):209-x. doi:10.1016/j.cpm.2005.10.005.
17. Schupp, CM. Sideline evaluation and treatment of bone and joint injury. *Curr Sports Med Rep*. 2009; May-Jun;8(3):119-24. doi: 10.1249/JSR.0b013e3181a60c65.
18. Shlvarathre, D.G., Howard, N., Krishna, S., Cowan, C. & Platt, S.R. Psychological factors and personality traits associated with patients in chronic foot and ankle pain. *Foot Ankle Intl*. 2014; 35(11): 1103-1107. doi:10.1177/10700714550648.
19. Vicenzino B, Paungmali A, Teys P. Mulligan's mobilization-with-movement, positional faults and pain relief: current concepts from a critical review of literature. *Man Ther*. 2007;12:98-108.
20. Wernli, K., Ng, L., Phan, X., Davey, P. & Grisbrook, T. The relationship between landing sound, vertical ground reaction force, and kinematics of the lower limb during drop landings in healthy men. *J Ortho Sports Phys Ther*. 2016; 46(3): 194-199. doi:10.2519/jospt.2016.6041.

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