



Medial Tibial Stress Syndrome Rehabilitation Guideline

This rehabilitation program is designed to return the individual to their activities as quickly and safely as possible. It is designed for rehabilitation following Medial Tibial Stress syndrome. Medial Tibial Stress Syndrome is defined as pain along the posteromedial tibia, positive fulcrum test and hop testing.^{1,2} Modifications to this guideline may be necessary depending on physician-specific instruction, specific tissue healing timeline, chronicity of injury and other contributing impairments that need to be addressed. This evidence-based medial tibial stress syndrome rehabilitation guideline is criterion-based; time frames and visits in each phase will vary depending on many factors including patient demographics, goals and individual progress. This guideline is designed to progress the individual through rehabilitation to full sport/activity participation. The therapist may modify the program appropriately depending on the individual's goals for activity following Medial Tibial Stress Syndrome

This guideline is intended to provide the treating clinician a frame of reference for rehabilitation. It is not intended to substitute clinical judgment regarding the patient's post-injury care, based on exam/treatment findings, individual progress and/or the presence of concomitant injuries or complications. If the clinician should have questions regarding progressions, they should contact the referring physician.

General Guidelines/Precautions

- Refer to Stress Fracture Guideline if diagnosis is confirmed
 - Tenderness to palpation along the posteromedial tibial border >5cm is consistent with a diagnosis of medial stress syndrome while tenderness in a span <5 cm is consistent with medial tibial stress fracture
 - If patient is having difficulty progressing, refer to rule out a stress fracture
- General healing timeline varies depending on severity and chronicity (between 4-12 weeks)
 - Rest and gradual return to activity (low-risk BSI, like MTSS, return to activity on average is 8-7 weeks)
 - Acute vs. chronic shin pain can affect the length of rest period needed for pain to subside.
 - Severity/irritability/nature/chronicity of symptoms may affect progressions
- Excessive foot pronation, if found, should be addressed. Focus on entire lower extremity kinetic chain.
- Consider possible abnormalities along LE kinetic chain (i.e., genu varus/valgus, tibial torsion, femoral anteversion, leg length discrepancies, ankle pronation/supination).

PHASE	SUGGESTED INTERVENTIONS	GOALS/MILESTONES FOR PROGRESSION
<p>Phase I Acute Phase</p> <p>Weeks: 7-14 days, may be up to 4 weeks depending on chronicity</p> <p>Expected Visits: 1-4</p>	<p>Discuss: Anatomy, existing pathology, rehab schedule and expected progressions</p> <p>Specific Instructions: If symptoms are present with daily activities, use a cast boot or pneumatic leg splint for 2-4 weeks.</p> <p>Suggested Treatments:</p> <ul style="list-style-type: none"> • Modalities as indicated: Cryotherapy, ultrasound, soft tissue mobilization, electrical stimulation • ROM: Gastrocnemius, soleus, flexor digitorum, tibialis posterior • Manual therapy: Soft tissue mobilization lower-extremity kinetic chain, joint mobilization to joints of the lower extremity kinetic chain where impairments are present (i.e., talocrural joint) Consider forefoot mobilization^{2,3} <p>Exercise Examples:</p> <ul style="list-style-type: none"> • NWB lower body strengthening focusing on quad, HS and gluteal • Core strengthening: Planks, side planks, palloff holds progressing from standing, half kneeling and to kneeling • Stretching: Hip flexors/quadriceps, hamstrings, gastrocnemius and soleus • Ankle motor control and resistance tasks • Foot intrinsic strengthening • Balance challenges progressing level of difficulty as able • Upper body strengthening <p>Other Activities:</p> <ul style="list-style-type: none"> • Aerobic conditioning to include cycling, swimming, deep water/pool running, Alter G or upper body ergometry 	<p>Goals of Phase:</p> <ol style="list-style-type: none"> 1. Diminished pain and inflammation 2. Educate on activity modification 3. Improved flexibility/range of motion if found to be limited 4. Reestablished dynamic muscle control, balance and proprioception <p>Criteria to Advance to Next Phase:</p> <ol style="list-style-type: none"> 1. No pain to palpation to anteromedial shin 2. Pain-free ADLs 3. Dorsiflexion within 5 degrees or less of non-involved side
<p>Phase II Subacute Phase</p> <p>Weeks 2-6</p> <p>Expected visits: 4-8</p>	<p>Specific Instructions:</p> <ul style="list-style-type: none"> • Establish gradual return to prior level of function. Start at <50% prior training volume. Abide by soreness rules (*see appendix*) <p>Suggested Treatments:</p> <ul style="list-style-type: none"> • Modalities as indicated: Edema-controlling treatments • ROM: Talocrural joint, mid/fore/rearfoot joints and LE muscle length • Manual Therapy: Continue as needed for joint and soft tissue limitations throughout the lower extremity kinetic chain <p>Exercise Examples:</p> <ul style="list-style-type: none"> • Foot/ankle strengthening <ul style="list-style-type: none"> o Progress balance activities, emphasize single limb stability o Heel raise progressions (DL --> eccentric focused--> SL heel raises) o Foot intrinsic strengthening in weight-bearing position • Lower extremity mobility <ul style="list-style-type: none"> o Gastrocnemius/soleus stretching o Continue to address lower extremity kinetic chain mobility deficits • LE strengthening <ul style="list-style-type: none"> o Double and single limb proximal stability exercise, may include: double and single leg squats, lunge variations, deadlifts, bridges, step ups, step downs, lateral band walks, etc. • Other Activities: Plyometrics <ul style="list-style-type: none"> o Double limb progressing to single limb plyometrics with cues as needed for soft landing and shock absorption o Progress Alter-G and pool activities if available at pain-free levels. • Other Activities: Plyometrics <ul style="list-style-type: none"> o Double limb progressing to single limb plyometrics with cues as needed for soft landing and shock absorption o Progress Alter-G and pool activities if available at pain-free levels. 	<p>Goals of Phase:</p> <ol style="list-style-type: none"> 1. Initiation of return to activity 2. Refer to Return to Running Guideline <p>Criteria to Advance to Next Phase:</p> <ol style="list-style-type: none"> 1. Ability to single-leg hop 15 times without pain or discomfort 2. 30-minute walk with minimal to no increase in pain 3. 6 repetitions, 6 seconds at 60% body weight squat 4. >25 single-leg heel raises bilaterally

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<p>Phase III <i>Advanced Strengthening</i></p> <p>Weeks 2-8</p> <p>Expected visits: 4-9</p>	<p>Specific Instructions:</p> <ul style="list-style-type: none"> • Continue with organized strength and plyometric program • Return to Running program (see appendix) - if parameters are achieved for readiness to run assessment • Encourage shock absorption strategies such as increasing step rate, step width and/or forward trunk lean • Avoid running on hills, uneven surfaces and very firm surface • Consider biomechanical analysis of running movements to identify risk factors for injury <p>Suggested Treatments:</p> <ul style="list-style-type: none"> • Continued use of modalities and manual therapy only as needed <p>Exercise Examples:</p> <ul style="list-style-type: none"> • Plyometrics: emphasis soft landing and hip strategy <ul style="list-style-type: none"> o Double limb: box jumps, drop jumps, forward jumps, tuck jumps o Single limb: lunge hop, single box hop, drop with single leg land, single forward hop <p>Foot/ankle strengthening</p> <ul style="list-style-type: none"> • Continue balance and foot intrinsic strengthening in single limb weight-bearing position <p>Lower extremity mobility</p> <ul style="list-style-type: none"> • Continue to address lower extremity kinetic chain mobility deficits <p>Hip strengthening</p> <ul style="list-style-type: none"> • Continue single-limb proximal stability exercises <p>Other Activities:</p> <ul style="list-style-type: none"> • Organized return to running program using soreness rules (see appendix) 	<p>Goals of Phase:</p> <ol style="list-style-type: none"> 1. Return to running 2. Return to recreational/sporting activity 3. Normal lower extremity kinetic chain strength 4. Normal lower extremity kinetic chain muscle length <p>Criteria to Advance to Next Phase:</p> <ol style="list-style-type: none"> 1. Pain-free completion of interval running program
<p>Phase IV <i>Return to Full Activity and Sport-Specific Training Program</i></p>	<p>Specific Instructions:</p> <ul style="list-style-type: none"> • Advancement in the weight room • Sport-specific progression drills • Progression back to mileage with supervision • Progress to unrestricted activity 	

Appendix

Soreness Rules – Related to pain or soreness at the site of injury:

CRITERION	ACTION
1. Soreness during warm-up that continues	Two days off, return to prior step
2. Soreness during warm-up that goes away	Stay at step until completed without soreness
3. Soreness during warm-up that goes away but redevelops during session	Two days off, return to prior step
4. Soreness the day after running	One day off and do not advance program to the next step

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