

## Medial Tibial Stress Syndrome (MTSS)/ “Shin Splints” Protocol

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### General Notes:

- Address underlying risk factors to include:
  - Femoral anteversion or hip dyskinesia resulting in hip internal rotation. Provide a hip-strengthening program.
  - Pes planus – neoprene or similar insole or more rigid shock absorbing orthotic may be utilized.
  - Calf muscle endurance
- Relative rest may be needed to improve symptoms
- Avoid downhill running and running on uneven surfaces if possible (especially during recovery)
- Address symptoms early on which may decrease total recovery time
- Initiate cross training to maintain fitness level. Options include:
  - Cycling
  - Swimming
  - Deep water running
    - Use of buoyancy vest
  - Antigravity treadmills
    - Do not start until athlete pain-free during walking or day to day activity
    - Can be used to maintain fitness level while protecting extremity
- Recovery time:
  - In general, the earlier treatment initiated, the quicker the return.
  - Recovery may be as quick as 8 – 9 days but has been described as lasting as long as 18 months (usual range 1 – 4 months)
- Elevated BMI is a risk factor. Counseling for weight loss indicated as needed.

	<b>Weight-bearing</b>	<b>Splint/Brace</b>	<b>ROM</b>	<b>Modalities</b>	<b>Exercise</b>
<b>Phase I</b> Initial Phase and pain control	Rest for MINIMUM of one week or until pain free.  If pain with walking, limit weight-bearing as much as needed with crutches.	None	As tolerated	Ice massage to area at least 3 times a day for 20 – 30 min while avoiding ice directly on skin  NSAIDs prn  Iontophoresis prn  Ultrasound prn	None
<b>Phase II</b> Advance activities  Criteria to start Phase II: Pain-free walking and initial rest for minimum one week.	WBAT as long as painfree	None	As tolerated	As per phase I	Begin cross training with low impact activity (bike, swim)  Begin core, hip, kinetic chain, and calf strengthening and endurance exercise.  Stretching program

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<b>Phase III</b> Advance to running.  Criteria to start Phase III: Phase II exercise must be pain-free	WBAT	None	As tolerated	As per phase II	Initiate <b>Return to Run Program (see below)</b>
<b>Phase IV</b> Return to full activity  Criteria: Successful completed of Return to Run Program	WBAT	None	As tolerated	As per phase III	Maintenance program for strength, endurance, flexibility and education on minimizing risk factors noted in “General Notes”

### Return to Run Programs:

There are many protocols that have been described. Some are listed below. Any protocol may be selected for completion.

#### Protocol 1:

- Once pain free with walking or daily activities begin “Walk to Run” program
  - o Begin to work up to 1 mile on track. If there is pain before reaching one mile during 10 or more sequential steps, STOP, rest for a day and try again.
  - o Once able to walk 1 mile on track without pain during or after, begin to progress run up to 0.5 mile. Run at own comfortable pace. If there is any pain during 10 sequential steps, STOP, rest for a day and try again. Continue to progress until able to run 0.5 mile without any pain during or after the run.
  - o Progress up with running as tolerated from that point.

#### Protocol 2:

- Once pain free for at least one week during walking or daily activities start to run every other day for 2 weeks at half usual pace and distance.
- After 2 weeks of running at half distance and pace, gradually increase running distance and frequency over the next 3 – 6 weeks to pre-injury level.
- Once back at pre-injury level, increase pace and distance as tolerated
- If any symptoms occur during or after activity, STOP, rest for 1 – 2 days and resume at a lower pace and distance (the last pace and distance that could be completed without pain during or after the activity)

#### Protocol 3:

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## Stage 1 Initial loading and jogging (50% normal pace) with increasing duration

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Level	A	Walk 30 minutes
	B	Rest
	C	Walk 9 minutes and jog 1 minute (x3)
	D	Rest
	E	Walk 8 minutes and jog 2 minutes (x3)
	F	Rest
	G	Walk 7 minutes and jog 3 minutes (x3)
	H	Rest
	I	Walk 6 minutes and jog 4 minutes (x3)
	J	Rest
	K	Walk 4 minutes and jog 6 minutes (x3)
	L	Rest
	M	Walk 2 minutes and jog 8 minutes (x3)
	N	Rest

## Stage 2 Running with increasing intensity

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Level	A	Jog 30 minutes
	B	Rest
	C	Run 30 minutes at 60% normal pace
	D	Rest
	E	Run 30 minutes at 60% normal pace
	F	Rest
	G	Run 30 minutes at 70% normal pace
	H	Rest
	I	Run 30 minutes at 80% normal pace
	J	Rest
	K	Run 30 minutes at 90% normal pace
	L	Rest
	M	Run 30 minutes at full pace
	N	Rest

## Stage 3 Running on consecutive days

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Level	A	Run 30 minutes at full pace
	B	Run 30 minutes at full pace
	C	Rest
	D	Run 30 minutes at full pace
	E	Run 30 minutes at full pace
	F	Rest
	G	Run 30 minutes at full pace

## Stage 4 Return to running

Table from Warden et al J Orthopaedic and Sports Physical Therapy 2015

Protocol adapted from:

Andrish et al J Bone Joint Surg 1974

Johnston et al Military Medicine 2006

Warden et al Journal of Orthopaedic and Sports Physical Therapy 2015