

MTSS (Shin splints) versus Tibia Stress Fracture

Risks for both: Running surface: Softer is better, if a runner on a track – don't run only clockwise, some days run counter clock wise.
Change "Good" running shoes every 400 miles or every 6 months- whichever occurs first

If a gymnast: Use tumble track when possible, use shoes during warm up and conditioning, watch your numbers on Vault and Fx

Landings: Heel to toe when running (rather than flat footed) If you can hear a "stomp" then this could be a risk
Dismount: Land "softly" with knees bent and ankles helping to absorb impact rather than only feet
Avoid "short landings" and "crunching" which can add stress to shins

Overuse: Watch numbers (if a runner- decrease mileage, if a gymnast decrease tumbling passes/hard landings)

Kinetic chain: Are your hips, knees, and ankle/feet incorrectly positioned when running causing added stress to the shins?
A PT can help with a running analysis

Flexibility: Hamstring, quadriceps, Achilles and calf muscles that are tight can result in unwanted stress to the shins

Diet/Hormones: Protein intake and enough calories: a young athlete needs more calories (than a non athlete)
for their sport, as well as normal development at their age- to have the ability to increase strength (muscle)
and help heal injuries

Estrogen in women and testosterone in men are "bone strengtheners"-

In females: a problem with menstrual cycles can increase risk for stress fractures

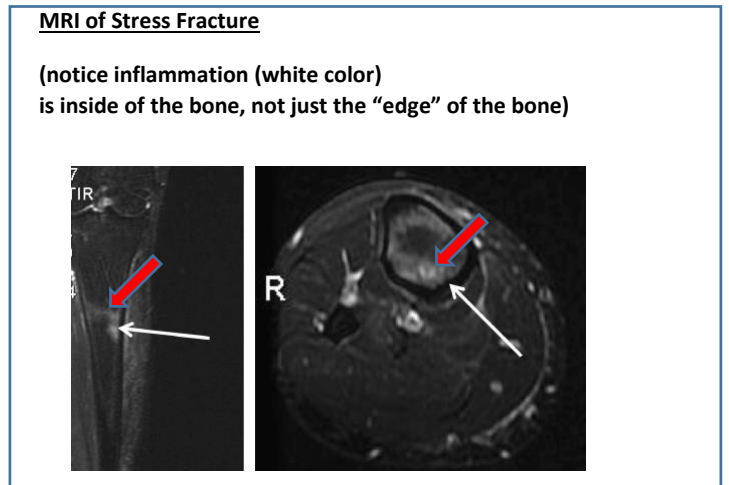
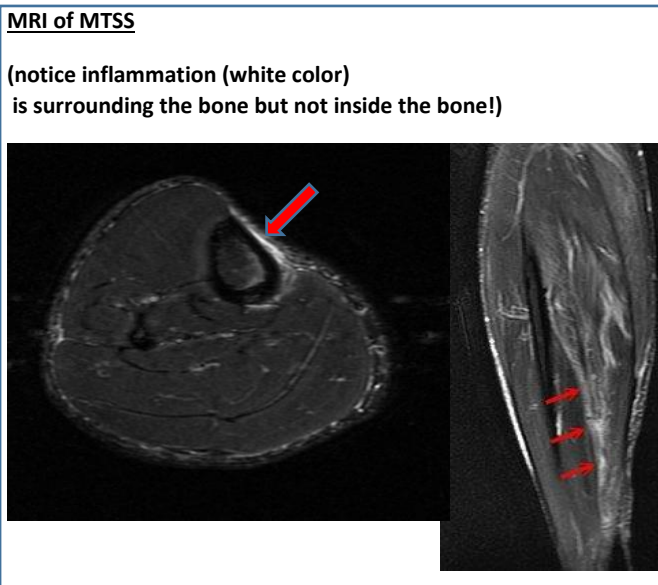
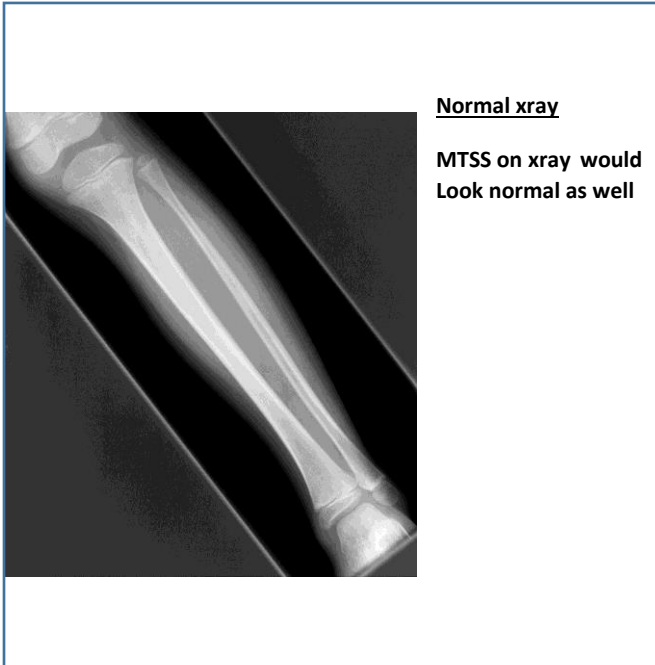
Medial Tibial Stress Syndrome (MTSS) once called shin splints is inflammation of soft tissues that connect to the tibia (shin) from too much pounding/impact or improper technique with impact (running and landing).

- Pain is typically a "strip" of pain down the length of the medial (inside) shin bone.
- OPTIONAL testing : Xray will be normal, MRI often will show inflammation of the connective tissue to the shin and at the "skin of the bone" (the periosteum)- but no inflammation (or edema) inside the tibia (the shin bone).
- Treatment is stretching, good running technique, decrease frequency of pounding/impact, ice, good shoe wear, and cautious use of NSAIDS (like Aleve). PT for a running analysis and kinetic chain analysis should be considered to decrease recurrences.
- Some athletes benefit from taping the shins, topical compounding cream, deep tissue massage, cold laser- but what might work for one athlete may not seem to help another with the same diagnosis.
- It is ok to modify activity (decrease amount) and continue if skills are safe (not limping) and the pain is decreasing with treatment.

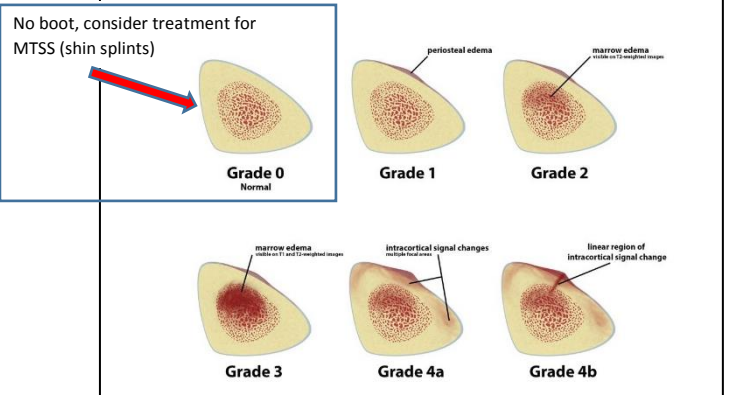
A stress fracture is an injury inside the bone rather than only at its "skin" (periosteum). Stress fractures can be caused from similar things as MTSS.

- Pain is more likely to be in a point tender area of the medial (inside) tibia (shin) rather than a strip of pain. While MTSS often improves a bit once "warmed up", stress fractures tend to worsen through a practice. Pain when "not doing anything" is also a possibility with a stress fracture (and not usually with MTSS (shin splints))
- REQUIRED testing: Xray is the first test (and sometimes shows thickening at the bone suggesting the bone is trying to heal) but if xray is normal MRI can still pick up a developing / small / or not seen on xray stress fracture – inside the shin bone (tibia). If the xray shows the problem MRI is not usually needed. If the xray does not reveal the problem- at least consider MRI as it is more sensitive than xray.
- Treatment is **NO IMPACT** (usually a boot and sometimes crutches too) for 6 weeks usually.
- Physical therapy after the rest period to help decrease recurrence by evaluating the running / landing / impact of the athlete and ensure there isn't anything in the technique that is a risk.
- It is NOT OK to continue impact/pounding (on the injured side) with a diagnosis of a stress fracture. Consider swimming, upper body only conditioning, or "anti gravity treadmill" during treatment time.
- Rarely, if rest and booting alone doesn't work, crutches, EXOGEN bone stimulator, medication, diet alterations, and as a last resort- surgery is considered.
- If an athlete has had more than one stress fracture in their life- then a special work up is considered to see if they are at risk for having "weaker bones" than other athletes their age doing the same skills. Problems may include anemia, thyroid disorders, vitamin D deficiency, hormone abnormalities, a metabolic bone disorder, etc. Blood tests and a DEXA bone density are often considered in this work up.

Radiologic Abnormalities for MTSS and Stress Fractures of Tibia (shin)



This is one "staging" system used with an MRI to help decide "diagnosis and treatment" for stress injury- all except "Grade 0" should have a period of time of NO IMPACT



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An example of the work up for MTSS versus Stress fracture:

Medial shin pain in an athlete that does impact
(Runner, gymnast, soccer, volleyball, etc.)

Eval: Pain is in a strip (3 inches or longer) down medial shin **(A) on the picture below**

Modify activity- decrease impact/pounding
Stretch/ice/good running technique /PT
Consider taping/topical cream/massage

If improving-
progress back to full impact (watch technique)

If not improving after 2-3 weeks then re-evaluate with doctor (consider stress fracture)

Eval: Pain is point tender (can be covered by a "Silver Dollar" sized coin) down medial shin **(B) on the picture below**

Xray-If normal: decide on MRI - or trial of MTSS treatment

Xray- If abnormal: typically boot for 6 weeks and NO practice/impact

If MRI normal: consider treating for MTSS

If MRI is abnormal (fracture or edema inside bone) then typically boot for 6 weeks and no impact/pounding

After 6 weeks of booting and no impact
Start PT and progress back to sport (usually 3-4 weeks)



(A) Strip of pain more likely MTSS (shin splints)

(B) Point tender spot more risky for stress fracture