Noisy Runners and Shin Splints

No, I'm not talking about loud conversations by runners circling Memorial Park (although that can be annoying at times). Last fall I was a coach and medical consultant for beginning runners In HARRA's Power In Motion (PIM) program for beginning runners. During the first weeks, several came to me with pain over the anterior leg, classic "shin splints" an injury which is more accurately called medial tibial stress syndrome (MTSS). As I watched (and listened to) them run I was impressed how much noise they made on footfall compared to their experienced running coaches. Sure, the pain improved with rest, ibuprofen and ice but the symptoms kept coming back after their next run. This concerned me because I know that there can be a continuum from MTSS to stress fracture over time.

What is different about the experienced, faster runners? Yes, most are lighter and they often wear better shoes, but beginning runners who are equivalent in weight and shoe wear still get far more MTSS.
So why do they have it and what can be done?

Let's examine the cause. The actual site of injury in the shin area is the muscle and its bony attachment (periostium) where there are about 700 stresses per shin for each mile that you run. The cumulative effect of this repetitive stress is believed to be the origin of MTSS (and eventually a stress fracture). MTSS is often called an "overuse injury", although the real problem is not so much overuse as it is a lack of preparation for use. MTSS occurs because the ankle dorsiflexors - the muscles which cock the foot toward the shin and also (as part of their eccentric functioning) keep the foot from being pulled away from the shin too rapidly - are not functioning as well as they should.

If a runner has weak ankle dorsiflexors, you can often hear him coming from far away because his feet will actually make slapping sounds against the pavement. Such a runner will be at high risk for MTSS, because the rapid downward movement of the foot will tear at and overstress the muscle attachment. In contrast, the athlete with strong, functional dorsiflexors will seem to pad softly along.

The dorsiflexors also deal with side-to-side and rotational motions of the foot and ankle during running, which are a natural part of the gait cycle. If there is repetitive, stressful motion in any direction, the shin muscles can be damaged. If you want to prevent shin splints, you can't merely develop strength in only one, non weight bearing plane of motion. Only by improving the functional strength of the dorsiflexors and the strength and

coordination of the entire ankle area can one prevent MTSS. So how do we do it?

EXERCISES: (three times a week)

ANKLE RAISES: Stand, back to a wall, with your heels about the length of your feet away from the wall. Lean back against the wall. Slowly cock both ankles and toes as far up as possible, keeping your heels on the ground. Lower your feet back toward the floor but do not touch. Complete about 12 to 15 reps.

ANKLE PULSES: In the same start position cock your ankles almost all the way and then QUICKLY move your ankles up and down 15 times over a very small range of motion. As you gain strength over time, advance both exercises from one set of 15 reps to two and then three sets of 15 with 30 seconds between sets.

SINGLE LEG RAISES AND PULSES: The position for this exercise is as before, except that you begin with only one foot on the floor. Bend the other knee and balance with that foot against the wall. This is harder but closer to what running requires. Begin with 12 to 15 reps per foot (both for the basic exercise and pulses), and progress to 3 x 15 (basic and pulse) on each foot as your strength increases.

STEP DOWNS: Begin with a natural body position and then step forward with one foot as though you were walking in your normal manner. When your heel makes contact, use your shin muscles to keep the sole of the foot from making contact with the ground (your foot is held up by the eccentric contractions of your dorsiflexors) . Repeat 15 times with each leg. Progress to 3 X 15 over time.

Then do the same exercise with progressively longer steps and force them to work more forcefully and quickly, as they must do during running. Start with one set of 15 reps of long steps per foot, and progress to 3 x 15 on each foot over time.

Finally, do the heel step-downs from a 4 inch step, which will increase the forces on your shin muscles to the greatest extent - and build the greatest amount of strength. Start with a short step and 15 reps. Progress step length and sets as you gain strength and coordination.

Obviously, none of these exercises involve full running impact. After, you can do these painlessly you need to progress to true functional exercises. That involves vigorous heel and toe walking both with feet pointed straight ahead and then with feet pointing first in, then out. Next comes skipping and bounding with ankle dorsiflexion accentuated while in the air.

The final step is running itself practicing running silently and emphasizing ankle dorsiflexion. If you find your feet beginning to slap, the run is over. Walk! Increase your distance only as far as you can run quietly.

Everyone should now be ready to help reduce noise pollution (AND AVOID SHIN SPLINTS!).