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The Perfect Runner

How to build a better running machine

By Mindy Solkin

motion due to the foot hitting the ground in front of their body rather than under it. When this happens, a braking action takes place, which can cause the dreaded shin splints.

Form Drill: While holding onto a sturdy object, stand sideways in front of a mirror with your legs shoulder-width apart. Lean forward until you're nearly ready to fall and rise up on the balls of your feet. Make sure your chest and butt are not sticking out. The line should look like a smooth 10-degree forward lean from head to ankles.

Stride Right

Improving your stride length (the angle of your legs when they are the greatest distance apart) and your stride frequency, or turnover rate (the number of foot-falls that hit the ground in a given time) will help to prevent injuries and make you a faster runner. When the stride is shortened due to vertical bouncing and lack of running-specific strength, a sinking action occurs, keeping your foot in touch with the ground for a longer period. Staying in the air longer requires more strength but will enable you to cover more distance. Increasing back-kick height, so that your lower leg raises to a nearly parallel position to the ground when it's behind you, and improving hip extension strength, so that your knee lifts higher in front, will increase your stride length. Taking more footsteps per minute will optimize your stride frequency. Try to aim for 90 steps a minute.

Form Drill: To increase stride length, start by marching in place with high knees, then run in place with high knees and finally start moving forward in this exaggerated marching position with quick footsteps for about 30 yards.

Arm Motion

While the lower body takes a lot more effort to correct, adjusting your arm swing is more of a tweak. Many runners swing their arms across the chest, so that the elbows point out to the sides instead of behind them. The upswing of the arm should allow the hand to stop at mid-chest height, while the hand should drive backwards to the side of the body on the backswing. The fore-

arm essentially stays parallel to the ground and the hands are gently cupped with palms facing toward each other. The arm swing should be one smooth movement with a 90-degree angle formed by the upper arm and forearm. The shoulders should be relaxed and held away from the ears.

Form Drill: Standing with one foot forward and knee bent, and the other leg outstretched behind you, and holding lightweight dumbbells (two to six pounds), move your arms vigorously forward and back for about 25 swings each side, while concentrating on keeping the 90-degree angle, palms toward each other and elbows driving back.

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Do you know how to run? This is not a trick question. It is vital for successful running to understand both the physiology of running (how our heart, lungs and muscles work) and the biomechanics of running. If you picked the right parents you may be lucky enough to be a genetically talented runner. But most people who run never think about the movement of their bodies. They go through the motions as if by rote, disassociating the sport from the task at hand. But running is a sport that needs skills training, just like a tennis player needs to learn how to hold the racket. Assessing your body in motion and correcting faulty biomechanics with technique and strengthening exercises will ultimately allow us to "play" our sport to the best of our ability. Here's how.

Body Alignment

Because the running motion is a series of changing postures using ballistic motions, the tendency is to displace the center of gravity (the point under your navel) by running in a vertical hopping style instead of the preferred forward-leaning position. Creating one smooth line from head to toe with a 10-degree lean from the ankles (not the waist), will allow for a controlled falling movement. The smoother the motion, the less energy expended to cover a given distance.

Slower runners tend to use a hopping

The Short and the Long of Running Form

Adapting your form to your particular long-distance running event is a smart move. For shorter races such as a 5K, you'll need to take quicker footsteps and have a moderately long stride. Quicker footsteps are a more tiring process but are suited for shorter races. For the marathon, you'll want to conserve more energy, so your back kick should not be too high.

Form Drill: Practice this on a treadmill. Put the speed at a comfortable pace, faster than marathon pace but slower than 5K pace and count your footsteps within a one minute period to give yourself a baseline. Then, change the speed to both faster than and slower than your baseline to simulate 5K and marathon pace, respectively. Count your footsteps within one minute at these two paces. During your next training run on the road, try to simulate the paces and footsteps of your treadmill run. Notice the mechanics of your form and try to simulate that on race day.