

# How's your running these days?

An overview of proper running technique and its importance.

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This column is based on the unfortunate experiences of one of the authors, and we are hoping that you will not repeat them! Right away, let us refute a popular belief: the authors are **not** natural runners; we just worked hard at it. But here is how it all started for one of us...

In 1994, terrible shoulder injuries put an end to a young woman's promising volleyball career. But then she (go figure who!) discovered orienteering and fell in love with this new sport. Unfortunately, she could not run to save her life! After a few years of orienteering at the pace of a turtle, our heroine finally decided to start a running program. She started reading magazines and began following a running program for beginners – although it was nothing like Wendy's Half Marathon Clinics<sup>©</sup>. The advice seemed sound and designed to progressively improve running ability. But after about 3 months, she started having terrible hip pain. She never suspected it could be her technique; shouldn't running be natural? So just like Forest Gump, she kept running. She kept running despite the pain, never realizing that she could actually run faster without pain by improving her technique.

Then in 1998 at an orienteering meet in New York state, her good friend Mark, never one to mince his words, told her she was running like a girl. She was not exactly sure what it meant at the time, but coming from Mark, it could not be good. When she asked, Mark told her that her hips were rotating too much, making her legs flare out, so she looked like a little girl running. Our runner did not care much about how she looked, but wanted to fix her inefficient technique. She worked on it and Mark stopped saying she ran like a girl – it appeared that her effort had worked.

For years she religiously trained for running. But she did not improve as quickly as she thought she should, although her fitness in other sports like cross-country skiing and mountain biking sky rocketed. And she kept getting injured, preventing her from improving. She suffered from chronic hamstring tendonitis, low back pain and sciatica – what a great concoction for a runner (or a *wannabe* anyway). Little did she know at the time that all of these problems could have been avoided with proper technique...

## Why is good running technique so important?

Good running technique is too often overlooked because we think that running comes naturally.

Unfortunately, running is not just a fast walk. It is in fact a totally different set of movements, and having proper technique will help you to:

- ◇ Be more efficient: correct technique maximizes the economy of running by eliminating unnecessary movement, such as side-to-side and up-and-down motions, thus transferring all of your energy into propulsion (moving you forward).
- ◇ Minimize the chance of injury: during running, the foot strikes the ground with a force greater than twice your bodyweight. With poor running technique, this force can be multiplied by tenfold. A combination of correct running technique and using appropriate running equipment can help reduce these landing forces and therefore the stress on your bones and muscles, minimizing the chance of injury.

## The correct running technique

The first concept that we will introduce is called *running tall*. Running tall means running light, running on the balls of your feet and toes (not your heels) with full back extension and hips and legs extended (do not *sit down*). Picture yourself barely touching the ground, or running while suspended from space by an invisible string. Here is a table that you can use to assess your running form.

Area of your body	Correct position for running
Head	Your head should be erect, with your eyes focusing far ahead. (notice pictures 1-2 where there is almost no movement of the head)
Shoulders	Your shoulders should be low, square and pulled back. Do not hunch your back.
Arms	Carry your arms low (your elbows should be bent at about 90 degrees - see picture 2). The motion of your arms should be straight forward and backward, avoiding letting your hands cross the midline of your body. Your arms should swing freely.
Hands	Your hands should be fairly relaxed, in a loose fist position (thumb on top of fingers). Imagine yourself carrying potato chips between your fingers and not wanting to break them, nor drop them.
Torso	Stay tall, keeping your back nice and straight. Keeping your spine erect permit better movement of the diaphragm and rib cage, allowing maximal breathing capacity. Resist the temptation to lean forward by bending at the waist as this increases the tension on the lower back and may cause injury. (notice how straight the back remains throughout the sequence of pictures)
Hips	Your hips should be square and level with almost no sideways movement. Minimize the amount of vertical displacement, unless you are trying to make it to the moon. Keep your hips level throughout the entire swing of the leg.
Legs	Your legs should be relaxed and move easily under the body like a wheel rolling smoothly along. Focus on <b>lifting</b> the leg off the ground as opposed to pushing off. Allow your knees rather than your feet to lead you forward. If you try to increase your stride length by reaching forward with your foot (called <i>overstriding</i> ) you will cause a braking action, which both slows you down and sends shock waves up through your entire leg with every stride – eventually causing all sorts of damage like chronic hamstring tendonitis.
Feet	Your feet should be pointed straight ahead and land directly under the hip. Focus on landing on your midfoot or ball of the foot as opposed to your heel. (Notice that in picture 2 the runner still is not touching the ground. He will only touch the ground once his foot is under his hip, as in picture 1)



Friends can help you diagnose your running technique by observing you and describing what they see. You can also use *technique drills* to improve your form. Such drills imitate the correct running form or part of it and help your body assimilate the proper technique. The more you practice the drills, the better your form becomes and the more you will be able to incorporate correct movement in your normal running, making you a more efficient and injury-free runner. We will describe one running drill, called *Running in Place*.

### **Running in Place**

This drill is performed slowly at first, but progresses in speed as your balance and stability improve. This drill should help you to focus on proper landing of the foot and emphasizes driving with the knee (as opposed to the foot), two essential components of proper running technique. You can also focus on remaining in an upright posture, coordinating the movement of your arms with your legs and stabilizing your movement.

1. Begin by marching slowly in place, landing on the balls of your feet, making sure your heels do not touch the ground.
2. As you are getting a feeling for landing with your foot directly underneath your body (if you land the foot in front of your body, you will not be able to stay in place and will start moving backwards), increase the cadence to a jog. Focus on the feeling of proper foot placement.



3. Increase the cadence to proper running pace (180-182 strikes per minute). Continue for a few minutes, focusing on your posture and proper knee drive.

If you are not totally sold on landing on the midfoot/forefoot as opposed to landing on the heel, try this other drill:

1. Jump around on both feet, landing on your heels. Focus on that feeling.
2. Keep jumping around, but move your weight to the middle of the foot. Focus on that feeling.
3. Keep jumping around and now move your weight to the ball of your feet.
4. Which of the 3 positions felt the smoothest and lightest? Wouldn't you like running your next 10k race feeling fast and light? Your choice!

### Other important points

- Technique drills should be performed before your workout, because this is when your concentration and energy levels are at their highest. This will also help you focus on using the proper technique in your upcoming workout. Performing drills after your workout when you are fatigued can lead to a lack of concentration and result in poor technique.
- Low intensity drills can be used as part of the warm up because they will both warm up your muscles and focus your mind on proper technique before you run.
- When practicing technique drills, perform them on a relatively flat terrain because it will allow you to concentrate on running form more than if you were exercising at a higher intensity running up or down hill or if you had to watch your footing.
- Your ankles, knees and hips undergo considerable flexion and extension during running so it is important that the muscles surrounding these joints are supple, allowing the joints to have a wide and pain-free range of motion. So before performing drills, be sure to perform your stretching exercises.

### Cleaning up your style

Running style is very personal, and with the same good technique, a lot of runners may look slightly different. What is important is to include the proper components in your style. Arms and legs flapping

all over the place are highly inefficient. Think of your arms as a propulsion mechanism. Do you want to reach the sky, or would you prefer to get to the finish line? Arms must be kept low with hands crossing the



This is one sad looking fellow

leg at hip level. Any higher than the hips and you are more than likely projecting yourself upwards instead of forward (see figure 1). Elbows and hands should stay in line with your direction of travel, moving forward and back, not sideways. Elbows moving out and hands crossing the front of your torso apply a lot of rotational force to the upper body, another huge waste of precious energy and momentum, and also a source of early back fatigue and tightness.

Keep your shoulders and face relaxed. There is no need to shrug the shoulders and grimace, nor clench your teeth when you run; doing so just wastes energy. Keep that energy for your engine! Your legs, same as your arms, should be pointing and moving forward. Your knees should be moving up and down while keeping a straight trajectory. Your feet should follow the same straight forward motion, not circling around and flaring out. Any extra rotational movement (running like a girl!) will make you work a lot harder for any given speed you achieve.



This guy knows how to run!

### Cadence

Cyclists know it, race-car drivers know it, track runners know it, but do you know it? It is all about how many revolutions per minute (rpm) the engine achieves. The more rpm, the more power you can develop. In running terms, rpm means leg turnover. You must move your legs quickly to become an efficient runner. This will at first put a little more strain on your heart and you will breathe faster and heavier even at an easy pace. But as you get used to it, you will notice that you can climb hills and run fast without feeling that your legs are going to fall off. Your heart is a miraculous engine that can just go and go for hours; your legs usually fatigue a lot faster than your heart. Increasing the cadence of

your running will make you breathe a little harder at first, but you will adapt quickly enough and realize that you can run for much longer distances than you used to, or simply run your routine loop faster than ever. The ideal cadence is between 85 and 90 strikes/minute per foot (so 170-180 strikes in total). Do a quick test on your next run: count how many times you strike the ground with your left foot in 6 seconds. Add a zero to that number, and that will give you your cadence per foot per minute. Aim at the numbers above for maximal efficiency.

### **Forward displacement**

When you are running, you want to move forward; not sideways, not upwards, but forward! So keep that in mind when you are on your daily (or weekly) jog. Every movement you do should be aimed at pushing you forward. So again, arms, legs, torso... everything should point forward, and in your mind, you should visualize all these segments moving forward.

### **How to practice**

We know treadmills are boring but they can be of great assistance when it comes to working on your technique. Find a gym that has mirrors in front of the treadmills so you can observe yourself as you run. Running on a treadmill is slightly different than running outdoors and requires less hamstring work. To compensate for that, always bring the treadmill to 1 to 1.5% elevation. This will ensure that your hamstrings are firing appropriately and will also reduce the pounding on the body. Keep your sessions short but focused, 15 to 20 minutes, once a week, until you find that your technique is appropriate. Return to the treadmill after a prolonged running break or any injury.

- **Style:** Mirrors do not lie! Your head should be straight and not tilted, your shoulders relaxed and level, your hands moving straight forward with elbows following directly behind (in fact, you should barely see your elbows – if you can see them, they are flaring out). Hands should be passing the leg low, at the hip level. Make sure you can check all of these body movements.

- **Cadence:** Set the treadmill at an easy speed (4.5 – 5 mph). Run your usual cadence and use a

watch to determine foot strikes per minute. Then speed your leg turnover up. Keeping the treadmill at a constant speed will ensure that you are not running harder, just quicker. Focus on how that feels for 4 minutes. It will take a while to adjust, and you will notice that you don't have to push nearly as hard to keep up to the speed of the treadmill. Let your mind wander again for a while, then recalculate your cadence. At first, you will revert back to your old habits when you stop focusing. But as you practice more, the faster cadence will become automatic. Try to remember how the cadence feels and take it outdoors. When you get more comfortable, try this drill at higher speeds. You will notice that you were probably already pretty close to the ideal cadence when running hard – your body already knew how to run well, you just had not noticed yet!!

- **Upward and lateral displacement:** These are the easiest problems to see while on a treadmill. Look in the mirror and find a reference point close to your shoulders or your head that doesn't move relative to your reflection. Notice how much your head or shoulders move up and down relative to your reference point. There should not be more than 1 ½ inches or so of movement. If there is more, there is a good chance that you are projecting yourself to the sky! Do the same exercise again but this time find a point closer to your waist or hips. Make sure there is no lateral displacement at all – your body parts should move straight forward and back.

It is amazing how much you can improve by just cleaning up these little details. It's not too shabby to discover you can run with that older fellow or Jane Doe who always used to beat you, even when you don't have enough time to train as hard as they do! Be patient and stay focused!

We wish we had discovered all of this information years ago when we were just starting to run. We also wish somebody had emphasized how important good running technique was and told us how poor ours was...

Hopefully this article will save some of you!