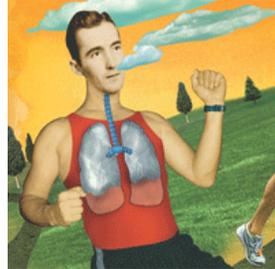


# RUNNER'S WORLD

## Lung Power

**Need more air? Deep breathing can help you run longer with less effort.**

By Gina Demillo Wagner; Image by Ellen Weinstein  
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Just before you crest a hill or reach the end of a speed interval, your lungs go into overdrive. Your breath becomes shallow and rapid. You think if only you could pull in more air, you could surge up that hill or maintain your pace. But the more your chest heaves, the more you struggle. You may even end up exhausted, bent over, gasping for air.

"Runners think about training their heart and legs, but they rarely think about training their lungs," says Mindy Solkin, owner and head coach of The Running Center in New York City. "A strong respiratory system can improve your running. It's a simple equation: Better breathing equals more oxygen for your muscles, and that equals more endurance."

Just as we strength-train our hamstrings and calves to improve our ability to power over hills, we can tone the muscles used for breathing. "Exercise improves the conditioning of the diaphragm, the muscle that separates the chest from the abdomen, and the intercostal muscles, which lie between the ribs and enable you to inhale and exhale," says Everett Murphy, M.D., a runner and pulmonologist at Olathe Medical Center in Olathe, Kansas. "When you take a breath, 80 percent of the work is done by the diaphragm. If you strengthen your diaphragm, you may improve your endurance and be less likely to become fatigued."

This was backed up by researchers from the Centre for Sports Medicine and Human Performance at Brunel University in England, who recently measured fatigue levels of marathoners' respiratory muscles and leg muscles. They found a direct link—runners whose breathing was the most strained showed the most leg weakness—and concluded in their study that the harder the respiratory muscles had to work, the more the legs would struggle in a race.

The key to preventing lung- and leg-fatigue is breathing more fully. "When you take deeper breaths, you use more air sacs in your lungs, which allows you to take in more oxygen to feed your muscles," says David Ross, M.D., a pulmonologist at UCLA Medical Center. "When I'm running, I concentrate on taking slow and deep breaths to strengthen my diaphragm."

Most runners, says Solkin, are "chest breathers"—not "belly breathers." To help her clients see the difference, she has them run a mile at a pace that gets them huffing a bit. Then she has them stop and place one hand on their abdomen and one hand on their chest and watch. The lower hand should move with each breath, while the upper hand should remain relatively still (usually the opposite occurs). "Every time you breathe in, your belly should fill up like a balloon," says Solkin (see "Breathe Right"). "And every time you breathe out, that balloon should deflate. When you chest breathe, your shoulders get tense and move up and down. That's wasted energy—energy you should conserve for running."

Chest breathing can be a hard habit to break—especially while you're preoccupied with keeping pace or calculating splits. One way to make the switch easier is to work on belly breathing when you're not running, and the skill will eventually carry over to your running. To make this happen, some

elite runners turn to Pilates, a program originally developed as a rehabilitation program for World War I soldiers. Pilates aims to increase flexibility, strengthen the core, and improve breathing (see "Breath Enhancers"). "I try to do Pilates twice a week," says 2004 Olympic marathoner Colleen de Reuck. "It stretches my intercostal muscles and lengthens my spine, which helps my breathing and my running."

"My athletes tell me 'my form is better, I'm not working so hard,'" says Pat Guyton, a Pilates instructor who teaches elite runners in Boulder, Colorado. "They mention less effort in the lungs-they're able to run farther before fatigue sets in."

### **Breathe Right**

Here's how Mindy Solkin, a New York City-based coach, teaches runners to engage their diaphragms.

### **Open Your Mouth**

Your mouth is larger than your nostrils, so it's more effective at taking in oxygen. Also, keeping your mouth open keeps your face more relaxed, which makes it easier to breathe deeply.

### **Breathe in Patterns**

Coordinating your inhales and exhales with your footfalls develops diaphragmatic strength. Start with a 2-2 pattern-breathe in while stepping left, right; breathe out while stepping left, right. Advance to 3-3 (breathe in, step left, right, left; breathe out, step right, left, right), and then a 4-4 pattern.

### **Breath Enhancers**

Cross-training exercises that reduce huffing and puffing

These three Pilates moves strengthen the diaphragm, stretch tight muscles, and improve posture-all of which help you run longer with less effort. Practice each exercise two or three times a week before you run.

#### **1) THE HUNDRED**

Lie on your back, knees bent, feet flat on the floor. Keep your arms at your sides, palms down. Inhale and lift your head, neck, shoulders, and arms off the ground. Lift your knees and extend your feet so your legs are straight and at a 45-degree angle to the floor. Take five short breaths in and five short breaths out. While doing so, pump your arms, moving them in a controlled up and down manner. Do a cycle of 10 full breaths-each breath includes five inhales

and five exhales. After you do 10 complete breaths, you will have completed 100 arm pumps.

> **The Payoff:** Teaches controlled breathing, so that your inhales and exhales are balanced. Bonus: Builds strong abdominals.

## 2) THE SWAN

Lie face down with your palms flat under your shoulders (as if you were going to do a pushup). Look down so your neck is in line with your spine. Inhale and slowly lift your head, neck, shoulders, and chest as you press your hands into the ground. Keep a slight bend in your elbows. As you exhale, slowly lower yourself back down, chest first, then shoulders, neck, chin, and head. To avoid discomfort in your back, concentrate on pulling your shoulders back to open up your chest. Repeat 10 times.

**The Payoff:** Opens up the chest and deepens your lung capacity to correct shallow breathing.

## 3) STANDING CHEST EXPANSION

Stand up straight with your feet shoulder-width apart, your knees slightly bent,

and your arms at your sides. Inhale and sweep your arms out and up so that your biceps are near your ears and your palms are facing each other. Exhale and lower your arms back down to your sides. Repeat four times, concentrating on breathing deep and opening your chest.

**The Payoff:** Stretches the intercostal muscles (which lie between the ribs), relaxes the shoulders, engages the diaphragm and pelvic floor, and helps balance breathing between the left and right lungs.

For more Pilates exercises that can benefit your running, go to [runnersworld.com/pilates](http://runnersworld.com/pilates).