Breath of Life

Think you know how to breathe? Some experts say 9 in 10 of us are missing out on the mental and physical benefits of breathing well.

By Hugh Delehanty • Illustrations by Carole Hénaff

The story in my family is that a coat hanger saved my life.

I was about 18 months old and was suffering with a horrible case of pneumonia that made it difficult for me to breathe. One night I was struggling so badly, my father called our family doctor and pleaded with her to make a house call. When she arrived, or so the tale goes, she took one look at me, grabbed a wire hanger from the closet, and performed an emergency tracheotomy on the spot.

Everything turned out fine, and within a few weeks I was up and crawling again, but what lingered for years was a feeling of vulnerability—and an ambivalent relationship to breathing—that has shadowed me throughout my life. I was hospitalized again with pneumonia in my teens, and even as an adult I sometimes struggled to exhale or mysteriously stopped breathing altogether. I started meditating years later and listened to teachers rhapsodize about following the breath, which was my idea of hell. I danced around it, focusing on noting thoughts or experiencing bodily sensations—anything except following the breath. But you can only hide from your breath for so long. Eventually, I would have to address the problem head-on. If breathing is the gateway to a happy and peaceful life, as many meditation teachers claim, how could I continue to ignore it?

ABOUT THE AUTHOR

Hugh Delehanty is a former editor for *People*, *Sports Illustrated*, *Utne Reader*, and *AARP The Magazine*. He wrote about applying design thinking to life planning in the February 2018 issue of *Mindful*.

Reset Your Body

A daily breathing practice to bring balance to your life.

In her book *Breathe*, Belisa Vranich says this five-minute routine will allow you to reset your body after a particularly stressful day by drenching every cell in it with oxygen—it will be a welcome relief to a body that's been flooded with carbon dioxide and low oxygen, adrenaline, and caffeine. The exercise will also allow you to quiet your mind so you can hear yourself think and will help you feel centered, balanced, and more connected to your feelings and the feelings of others.

PART ONE

Duration: two minutes

1

Lying on your back, put one hand on your belly and one on the top of your chest.

2

Breathe through your mouth in order to take in as much oxygen as possible.

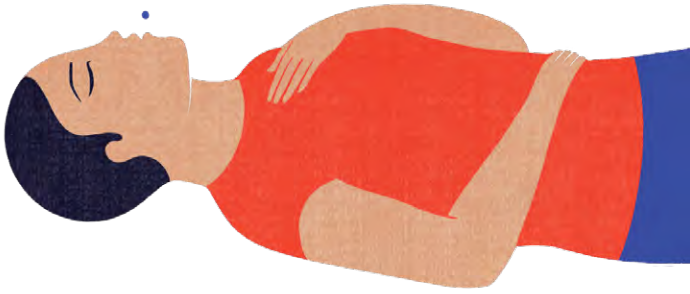
3

The first inhale should make your belly rise. (The hand on your chest should not move.) Then, without exhaling, take another inhale and fill the top of your lungs. (This time the hand will move.) These two inhales should be distinct, even if the second one is small.

4

Exhale enthusiastically, for the same amount of time as the two inhales took, combined.

Make sure to continue breathing through your mouth for the entire first part. The first time you try this, you may feel like you've hit a wall after 20 breaths or so. If that happens, encourage yourself calmly and firmly to continue breathing. However, don't push yourself too hard.



PART TWO
Duration: three minutes

1
Move your hands away from your body. Rest your arms at your sides, palms up. Let your feet fall outward. You may keep breathing through your mouth or switch to your nose. Relax your lips, your face, and the roof of your mouth. Let your tongue get heavy. Very important: Let your jaw relax. Pay attention to your cheeks, ears, and neck, relaxing them with each exhale. Relax your shoulders and the rest of your body.

2
Continue scanning your body to ensure that you're not holding tension anywhere. Imagine that with each inhale you are letting yourself float a little higher, and with each exhale you are letting yourself sink a little deeper. Try to move your mind away from thinking and simply keep your attention on your physical sensations. Observe your breath as if you were watching another person.

As Vranich points out, "Relaxing your body so that stress hormones and blood pressure decrease recharges your battery within minutes and encourages mindfulness. Do it as often as possible, ideally every day."

So, I reached out to Belisa Vranich, the author of *Breathe*, a classic book on the mechanics of breathing. Vranich, a psychologist who runs a learning program called The Breathing Class, got interested in breathing when she started practicing in New York City and found that many of her patients were so agitated they couldn't take in anything that she had to say. But when she started looking for some simple breathing techniques to teach them, she found that, even though everyone agreed that breathing was important, the majority of people—including many experts—were doing it all wrong.

Based on her research, Vranich estimates that at least nine out of every 10 people aren't using their diaphragms as a primary breathing muscle. Instead, they're breathing *vertically*, lifting their shoulders and sucking in their guts on the inhale, as if they were striking a Superman pose. "That's anatomically incongruous," she said. "There's no other animal on the planet that breathes like this. We're taking this beautiful machine and using it in a way that makes no sense based on how it was designed."

Breathing up and down, instead of out and in, disengages the diaphragm and makes it difficult to take a full breath. It also triggers a shift in the autonomic nervous system, which is made up of two counterbalancing parts: the sympathetic nervous system and the parasympathetic nervous system. The sympathetic system usually kicks in when we're facing danger or are under a great deal of stress (a.k.a. the "fight or flight" response). In ordinary circumstances, once the initial threat diminishes, the parasympathetic system will step in and set in motion the "rest and digest, restore and repair" functions. But if you're constantly breathing with your neck and shoulders, it signals the vagus nerve—our internal stress detector—to send a message to the brain that the body is on overload. →

Your Body on Deep Breathing

Deep breathing has been found to benefit your whole body in powerful ways. Here are some key perks to lengthening your inhale and exhale, according to research.

Immune Strength

Studies have found that the activation of the vagus nerve and parasympathetic nervous system can **boost immune health** and **reduce inflammation**.

Less Stress

Deep breathing helps **regulate stress and anxiety** by activating the **parasympathetic nervous system** and increasing **vagal tone**, which triggers the relaxation response.

Tension Release

Chest breathing, which many of us do by default, can be caused by and can lead to muscle tension. Deep breathing can help those tense **muscles relax**.

Fresh Oxygen

By engaging more parts of the lungs, deep breathing has been found to encourage **fuller oxygen exchange**, the process through which fresh oxygen moves into the cells and carbon dioxide gets expelled with each breath.

Healthy Heart

Deep breathing has been found to boost heart health in a number of ways, most notably by lowering and **stabilizing blood pressure, improving circulation**, and **slowing the heart rate**.

As a result, many of us spend a good part of our day in low to high fight-or-flight mode. That can play havoc with our nervous system, our digestion, our blood pressure—not to mention our ability to get a good night's sleep.

The key to preventing this from happening, according to Vranich, is to learn to breathe the way we were designed—*horizontally*, expanding the belly outward on the inhale and narrowing it on the exhale, which engages the diaphragm and other breathing muscles in the process. The most common breathing techniques focus on counting breaths and inhaling and exhaling according to fixed patterns. There's nothing wrong with that, said Vranich, "but most people don't have much success doing that because their diaphragms are in spasm. They've been bracing so long their diaphragms don't stretch anymore. So, I show them how to unlock their diaphragms and they start feeling better immediately."

The Mechanics of the Breath

To help me understand and get things rolling, Vranich invited me to take a private class with Alyson Khan, one of her senior teachers in Los Angeles. Khan, a cheerful woman in her thirties, watched me take a few breaths and concluded that I had a strong horizontal inhale but an iffy exhale. "You must be bracing somewhere," she said.

"Bracing" was one of Alyson's favorite words. In fact, learning to use mindfulness to manage her bracing habit was a key turning point for her. It all started in grade school when her classmates started calling her "Fatty" even though she wasn't overweight. And soon sucking it in became second nature. "We live in a culture of gut-suckers," she quipped. "What do we do when we walk into a room? We lift our chest up, throw our shoulders back, and suck our gut in, because, God forbid, you don't want to look chubby. In LA, they might even write you a ticket for that."

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>
> Psychologist Belisa Vranich

Now she finds she often braces when she's racing to beat a traffic light or navigating a tense social situation or spotting a text from someone she's trying to avoid. "Bracing is the body's natural way of protecting itself," she said. "If you're not aware of that, you're going to carry that stress in your body throughout the day, and it will affect how you relate to others." It wasn't until she started paying attention to her breathing that things began to change. The key, she said, was being attuned to when she was on the verge of bracing and then asking herself, "Do I really want to be doing that all day?"

Next, Alyson showed me how to calculate my Breathing Intelligence Quotient (or BIQ for short), a tool Vranich developed to measure what she calls your "vital lung capacity." It involves using a measuring tape to determine the expanse of your ribs when you inhale compared with →

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when you exhale. In my case, the difference was two inches (40-inch inhale/38-inch exhale). That translated into 52% capacity, or a letter grade of D. I was crestfallen, but Alyson reassured me, saying most of her students "fail miserably on their first try, so you must be doing something right."

Then she said, "Do you want to see what your diaphragm looks like?" and pulled out a vegetable steamer basket—the kind with flaps that expand and contract. I was flabbergasted. When you look at anatomy charts in a doctor's office, the diaphragm is usually portrayed as a thin red line, but it's the biggest breathing muscle in your body, about the size of a small pizza, and it will expand four or five inches when you inhale (if you let it) and shrink back into place when you exhale. "The digestive organs are right below the diaphragm and they get really happy when you're breathing the way you're supposed to breathe," Alyson said. "And so does your heart. Everything gets really happy, and if you do it long enough, your body will remember and want to breathe that way all the time."

To bring my sorry diaphragm back to life, Alyson put me through an exhausting series of exercises, including Rock 'n' Roll (shifting back and forth between powerful belly breaths and crunching exhales while seated), Diaphragm Extensions (lying with my back on the floor and lifting a 20-lb. weight up and down with my belly muscles), and Exhale Pulsations (exhaling rapidly as if blowing out a candle 40 or 50 times). By the end, I felt bone weary, but strangely exhilarated. My lips, fingers, and toes were tingling, and the buzz lasted for hours. I don't think my cells had ever been bathed in that much oxygen before.

Just before I left, Alyson had me do another BIQ reading. This time the gap was 2.75 inches, which translated into 72%, or a strong C+.

Maybe there was still hope.

My Breathing Regimen

The next day Dr. Vranich and I met on a video call. She was in her apartment in New York City, where she spends most of her time when she isn't traveling the world teaching firefighters, pregnant women, extreme athletes, and other folks how to get more intimate with their diaphragms. She told me I was a rare specimen: a horizontal inhaler (good) and a vertical exhaler (not so good). She speculated that I'd conditioned myself after the tracheotomy to brace on the exhale and, as result, had a lot of stale CO_2 stored in my body. "You've never had the muscle memory of a good exhale," she said, "so we have to teach you a new way of moving your muscles."

Her solution was to train me to relax my front abdominal muscles on the exhale and squeeze out the air with my diaphragm, lower abs, intercostals, obliques, and the muscles of my pelvic floor. Essentially, she figured that if I learned to breathe correctly with those muscles, my front abs would start mimicking the movement by association. "Your belly muscles are going to do it because your side muscles are doing it," she explained.

So, over the next several weeks, Belisa put me through a grueling regimen aimed at strengthening my intercostals (the small muscles attached to the ribs) and my obliques (my side abdominals) and getting them to work in harmony with my other breathing muscles. She also taught me how to tilt my hips forward on the inhale and backward on the exhale to engage my glutes and pelvic floor muscles. "I want you to feel as if you're being scooped out in the middle and your belly button is getting closer and closer to your spine," she said.

It was hard mastering this motion, at first. But eventually, after several weeks of daily practice, it started to feel virtually automatic. My breath suddenly became fuller and more relaxed, and, every now and then, I could feel myself slipping into a natural breathing rhythm without even thinking about it. In the beginning, Belisa said my goal should be an 100% BIQ score, and by the end of week four, the readings began to climb into the high 80s.

Breathing for Better Health

A hot topic for breathing researchers lately has been slowness. Recent studies by cardiologist David O'Hare and others have shown that slow-paced breathing can have a positive impact on heart rate variability, a measure of the heart's ability to adapt to stress. Increasing HRV makes the system more flexible and resilient. That's why it's often cited as a predictor of longevity and overall well-being.

None of these studies surprised Richard Brown, an associate clinical psychiatry professor at Columbia University—and an adept in aikido, qigong, Zen meditation, and other practices—who has spent most of his career studying the benefits of slow breathing. He and his wife, Patricia Gerbarg, an assistant clinical profes-

sor at New York Medical College, have developed a program of exercises, detailed in their book *The Healing Power of the Breath*, which have produced remarkable results in studies of patients with anxiety, depression, insomnia, and other conditions.

The exercises are based, in large part, on traditional qigong and yogic practices, and the couple's work with patients over the past 25-plus years. According to Brown, the ancient qigong masters had a deep understanding of how the autonomic nervous system works. As evidence, he cited a treatise in the *Tao Te Ching*, that "starts out by saying that the purpose of breathing practices is to become like a newborn baby," which aligns directly with O'Hare's research on breathing and heart rate variability. The ancient Chinese texts, Brown said, instructed beginning students to learn slow "natural" breathing first, to restore *yin* to the body, which is related to the parasympathetic nervous system. And once they'd mastered that, they were given fast breathing exercises to generate ***yang***, which parallels the sympathetic system. Then, in the final stage, they returned to slow breathing to integrate and balance the practice. →

Get Energized

A breathing technique to refresh your mind and get moving.

"Ha!" breathing is helpful when you're drowsy or feeling fuzzy and need something to wake up your mind. Try it first thing in the morning or any time when you are tired and faced with demanding mental tasks. For most people, the exercise works best in short takes of two to five minutes. It's perfectly fine to do it two or three times throughout the day.

Note: Although "Ha!" breathing is safe for most people, it should be avoided by those who have uncontrolled hypertension, seizure disorder, pregnancy, recent surgery, aneurysm, hernia, or bipolar disorder.

Here are the basic instructions from Richard Brown and Patricia Gerbarg's book *The Healing Power of the Breath*:

1
Stand up straight, with your elbows bent, forearms parallel to the ground, palms up, and fingers curved into loose fists.

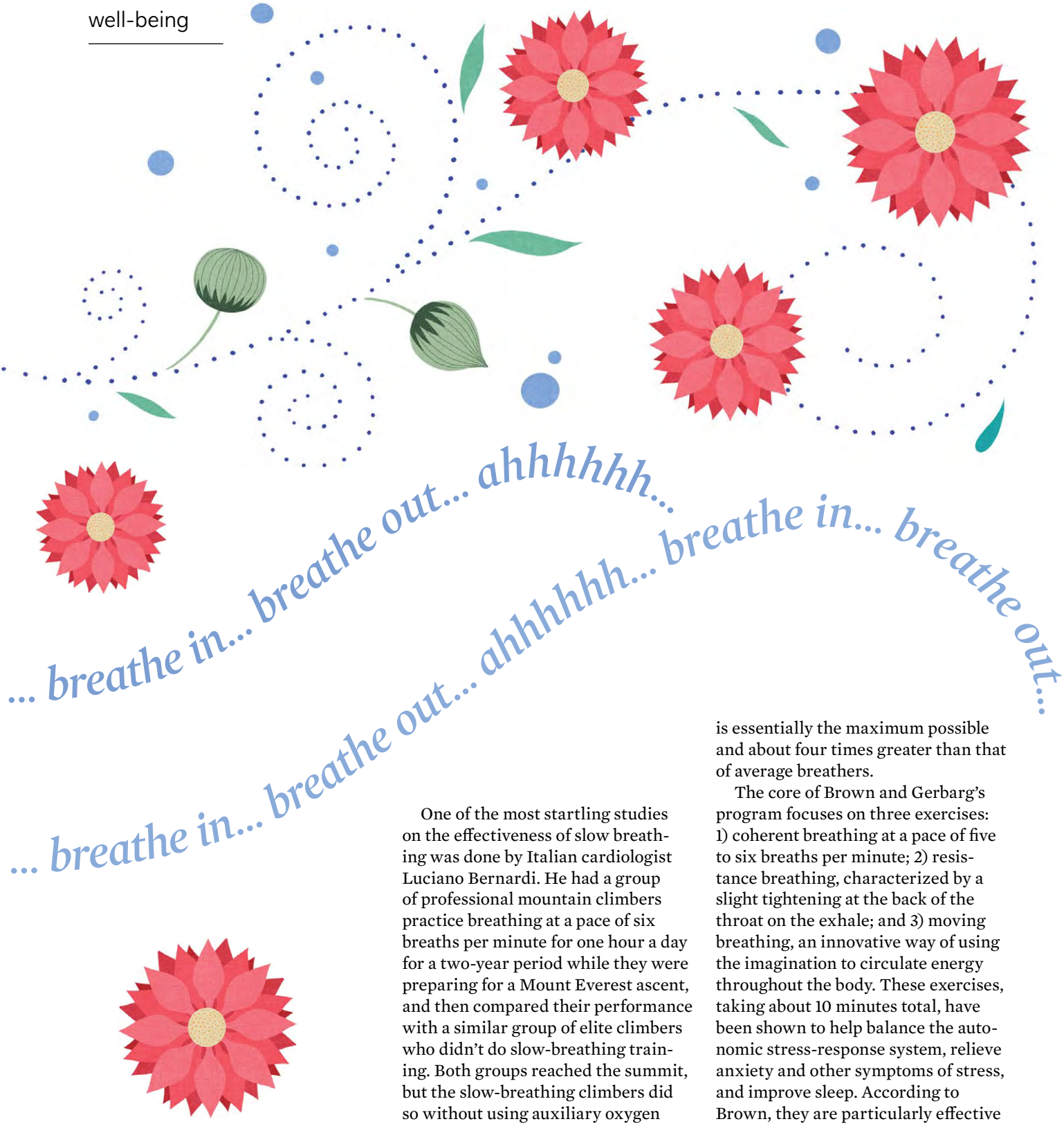
2
Inhale, breathing deeply through your nose while drawing your elbows behind your back.

3
Exhaling sharply, shout "Ha!", while extending your arms and thrusting your hands forward while flipping your palms down, as if you were flinging water off your fingertips.

4
Inhale deeply, again draw your arms and elbows back, turn your palms up, and curl your fingers to form loose fists.

5
Exhale sharply with the "Ha!" sound, repeating the same thrusting arm and hand movements.

Each round should be done quickly, breathing in and out at the rate of one breath per second.



One of the most startling studies on the effectiveness of slow breathing was done by Italian cardiologist Luciano Bernardi. He had a group of professional mountain climbers practice breathing at a pace of six breaths per minute for one hour a day for a two-year period while they were preparing for a Mount Everest ascent, and then compared their performance with a similar group of elite climbers who didn't do slow-breathing training. Both groups reached the summit, but the slow-breathing climbers did so without using auxiliary oxygen and averaged about 10 breaths per minute at the end of the climb, while the other climbers resorted to oxygen and finished breathing twice as fast at their counterparts. Another surprising result was that the slow-breathing climbers were able to use 80% of their lungs' surface during the climb, which is essentially the maximum possible and about four times greater than that of average breathers.

The core of Brown and Gerbarg's program focuses on three exercises: 1) coherent breathing at a pace of five to six breaths per minute; 2) resistance breathing, characterized by a slight tightening at the back of the throat on the exhale; and 3) moving breathing, an innovative way of using the imagination to circulate energy throughout the body. These exercises, taking about 10 minutes total, have been shown to help balance the autonomic stress-response system, relieve anxiety and other symptoms of stress, and improve sleep. According to Brown, they are particularly effective when combined with an additional 10 minutes of movement and meditation.

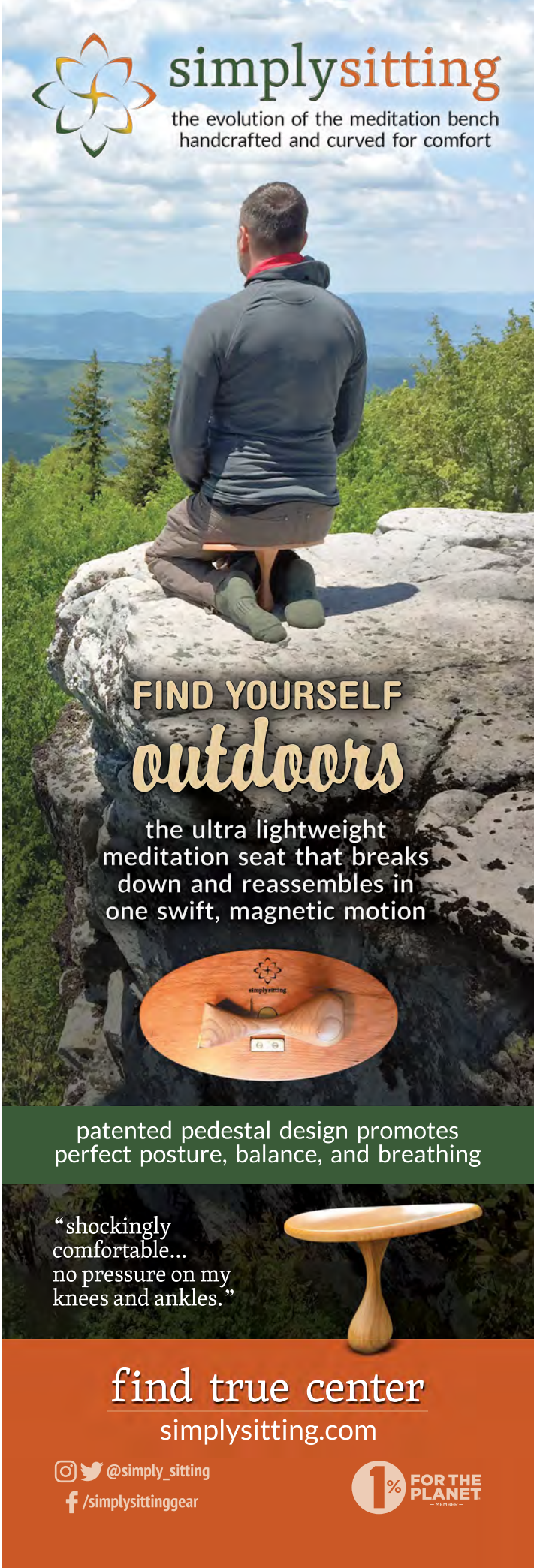
Brown and Gerbarg have spent a good deal of time over the past two decades teaching breathing exercises to survivors of mass disasters, including the 9/11 World Trade Center attack, the Gulf of Mexico oil spill,

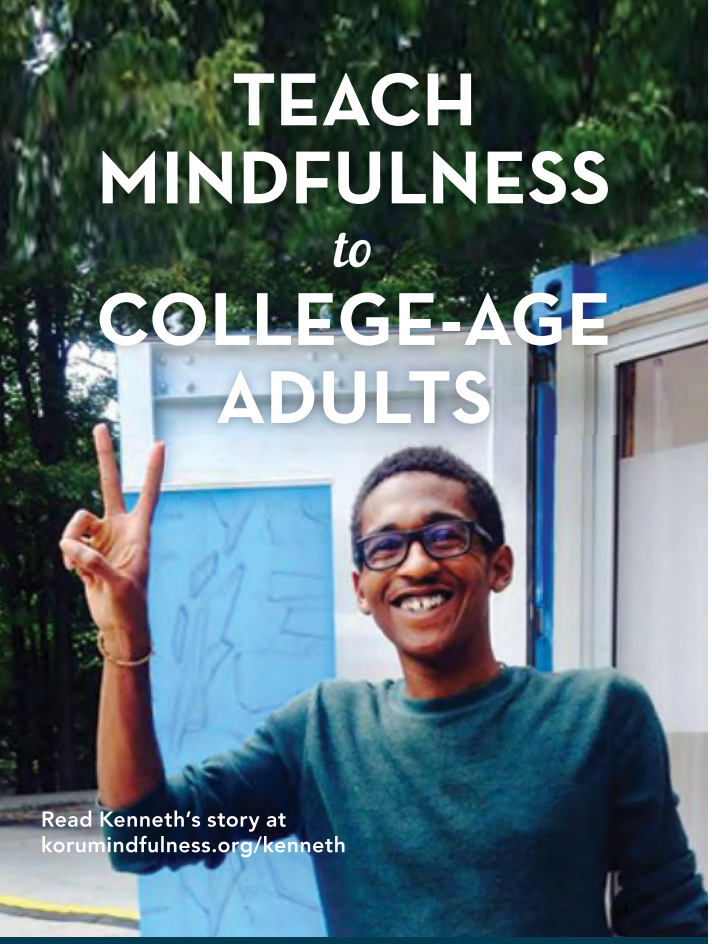
and the Sudan and Rwanda genocides. One of the studies they did after the 2004 Indian Ocean tsunami showed that slow-breathing practices dramatically reduced symptoms of PTSD and depression—in a matter of days, in some cases.

"What trauma does is disrupt the healthy balance of different parts of our nervous system, which are meant to work together," said Brown. "When people have to strive to survive, their stress response becomes overactive and the soothing part of the system declines. But we've found that you can bring it back into balance by shifting the way you breathe. More research needs to be done on this, but our feeling is that breathing breaks the link between negative emotions and the memory of events. It kind of washes away the stored pattern of the incident and reformats your cerebral cortex."

A moving example is the story of Sonya, an office worker who was miraculously rescued from the World Trade Center. She'd been working in the towers during the previous attack in 1993, so she didn't hesitate when the first plane crashed into her building on 9/11. She got up from her desk on the 80th floor and started running down the stairs in high heels as fast as she could. Halfway down the stairwell, she collapsed from exhaustion, but two men carried her the rest of the way, in total darkness except for the faint glow of a distant policeman's flashlight. Twenty seconds after they escaped, the building collapsed.

Afterward, Sonya developed PTSD and was constantly haunted by anxiety, nightmares, and unbearable feelings of distress. She tried conventional treatment, medication, and some alternative approaches, including resistance breathing. But nothing seemed to work. Finally, seven years later, she signed up for one of Brown's and Gerbarg's workshops and made an impressive recovery. At the end of the weekend, she revealed this was the first time since the tragedy that she felt as if she'd gotten her life back. →





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Making Friends with the Breath

My experience was somewhat less dramatic. But I spent a few weeks practicing Brown and Gerbarg's exercises, using the CD included with their book, and was impressed by the calming and energizing effect the techniques had on me. I think it helped that I had done Vranich's intense workouts and had a greater command of my breathing muscles. At one point, I was so immersed in the long five-breaths-per-minute sequence that I lost the self-consciousness I'd often experienced meditating, and let myself surf along with the breath. The years I'd spent terrified of my breathing suddenly faded into memory.

A few weeks later, I did my last BIQ reading with Dr. Vranich. It seemed almost anticlimactic, given everything we'd been through, but the tale of the tape was indisputable. My inhale measurement was 41½ inches and my exhale 37¾ inches, for a total of 3.75 inches and 99% vital lung capacity.

"Congratulations, sir, you're a completely horizontal breather!" she exclaimed. Then, without missing a beat, she added, "Now that you're an A student, why not go for an A-plus?"

You must be joking, I said to myself. But looking into her eyes, I realized that in her view, despite all the work I'd done, I'd just skimmed the surface.

Jim Morningstar, a psychologist I interviewed for this story, describes the breath as one of our most intimate companions because we can't go for more than a couple of minutes without it. "When you connect with your breath, you're connecting with your spirit," he said. "That's the experience many people have doing breathwork. After a while, they're not breathing anymore. They're being breathed."

Clearly, I still had a long way to go. But I was excited about the next part of the journey because my relationship with my breath had shifted. To borrow Humphrey Bogart's famous line, it felt as if this could be the beginning of a beautiful friendship.

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