

Breathing Exercises Can Help Control High Blood Pressure

By Dr. Mercola

One in 3 American adults have high blood pressure (hypertension). An equally large segment of the adult population has prehypertension, meaning your pressure is higher than normal but not high enough to qualify as hypertension. Nearly 1 in 4 American adults also reports feeling extremely stressed, and these two conditions — stress and hypertension — tend to go hand-in-hand. Unfortunately, this connection still does not receive the emphasis it deserves.

Many breathing experts also agree that 9 out of 10 people breathe poorly, which negatively impacts both your stress level and your blood pressure. The good news is that correcting your breathing can help alleviate both of these conditions.

Dr. John Kennedy, cardiologist and author of “The 15-Minute Heart Cure: The Natural Way to Release Stress and Heal Your Heart in Just Minutes a Day,” featured on “The Doctors” in 2011 (above), developed a breathing and creative visualization technique that can be done anywhere, anytime to reduce stress, lower your blood pressure and protect your heart.

Tammy, the test subject on the show, lowered her cortisol by 20 percent simply by doing this technique. Indeed, by teaching your body to slow down and relax, which essentially short-circuits your physical stress reaction, you can protect your health, and your breathing can either trigger or hinder your relaxation response.

Your Breath and Blood Pressure Are Closely Related

Researchers at the University of Melbourne and Macquarie University believe essential hypertension (high blood pressure with no known cause), which is the most common form, may be prevented by implementing breathing exercises, provided you start doing it early enough. As reported by HealthCanal: *“Lead researcher [p]rofessor Andrew Allen says the research parallels what sportspeople and eastern philosophies have long understood about the link between breathing and heart rate. ‘Biathletes have to regulate their breathing to slow down their heart rate before rifle shooting, and eastern meditative practices such as yoga and pranayama have always [emphasized] the interaction between the two’...”*

The researchers discovered that by interrupting the activity between two types of neurons — ones controlling breathing and others regulating blood pressure — in young mice, they were able to dramatically reduce the development of hypertension in adulthood.⁶ Unfortunately, in adults, where the synaptic interactions have become more fixed, the blood pressure reduction was only temporary. As reported in the featured article: *“Breathing and blood pressure are functionally linked through the sympathetic nervous system, which sends nerve signals to the heart and blood vessels.*

The altered neural activity leads to increased fluctuations in blood pressure with every breath and are seen in both the animal model and young, healthy adults at risk of developing high blood pressure in middle age. This [emphasizes] the need to identify people at risk of developing high blood pressure early.”

Why Deep, Slow Breathing Is so Calming

Other recent research⁸ shows the reason controlled, purposeful breathing is so calming is because it doesn’t activate specific neurons in your brain that communicate with your arousal center. Put another way, the reason rapid, shallow breathing is so stress-inducing is because it activates neurons that trigger arousal, which typically translates into worry and anxiety.

In this animal study, researchers were attempting to identify different types of neurons and their role in breathing function. They were focused on the pre-Bötzinger complex, also known as the breathing pacemaker. As reported by The New York Times: *“More than 25 years ago, researchers at the*

University of California at Los Angeles first discovered a small bundle of about 3,000 interlinked neurons inside the brainstems of animals, including people, that seem to control most aspects of breathing. They dubbed these neurons the breathing pacemaker."

The researchers honed in on 175 neurons in the breathing pacemaker, which they then "silenced" (eliminated) in the mice, with the expectation that this would alter their breathing patterns. However, that didn't happen. There were no changes at all in their breathing patterns after the neurons were knocked out.

Instead, the researchers were surprised to find the mice became very relaxed, and remained relaxed even in situations where anxiety would normally be triggered. What they discovered is that these neurons positively regulate neurons in a brainstem structure called the locus coeruleus, which is linked to arousal. It is, in other words, the formerly hidden link between breathing rate and emotional state. Study coauthor Jack Feldman, distinguished professor of neurology at UCLA, told The Verge: *"It's a tie between breathing itself and changes in emotional state and arousal that we had never looked at before. It has considerable potential for therapeutic use."*

While the creation of drugs to target this brain region is likely part of the agenda, there are natural methods already known to do so. Controlled breathing, or pranayama as it's known in the practice of yoga, is a central part of many ancient traditions.

Breathing Exercises Lower Blood Pressure

Breathing exercises have been found to impact both your blood pressure and stress, which makes sense considering how closely tied those two conditions are.

A recent article in University Health News cites several studies showing breathing exercises help lower blood pressure. For example, one 2005 study found taking six deep breaths in 30 seconds (each inhale and exhale lasting five seconds) lowered systolic blood pressure anywhere from 3.4 to 3.9 units, compared to simply resting in a seated position.

As noted in the article, apps and devices are available that will guide your breathing to help you get down to 10 or fewer breaths per minute. Studies have found using such devices for five minutes, three to four times per week, can help lower blood pressure in patients with hypertension.

Dr. Konstantin Buteyko, creator of the Buteyko Breathing Method, discovered he could lower his blood pressure simply by bringing his breathing toward normal. In this way, he successfully "cured" his own hypertension. In 1957, he coined the term "disease of deep breathing," having researched the health effects of excessive breathing for over a decade.

The problem with shallow, rapid breathing is that it activates your sympathetic response, which is involved in releasing cortisol and other stress hormones. Controlled deep breathing, on the other hand, helps trigger your relaxation response as it activates your parasympathetic nervous system, which in turn slows down your heart rate and digestion while promoting a state of calm.

Controlled breathing exercises have also been found to modify stress-coping behaviors and initiate appropriate balance in cardiac autonomic tone, a term that describes your heart's ability to respond to and recover from stressors.

Sample Breathing Exercise to Control Anxiety and Reduce Stress

There are many different breathing techniques out there. As mentioned above, simply inhaling and exhaling to the count of six can go a long way toward regulating your breathing and lowering your blood pressure. Be sure to breathe through your nose, not your mouth. Another variation is the "HA" breath, which involves inhaling slowly through your nose, then exhaling quickly while saying "ha" out loud.

The following is a Buteyko breathing exercise that can help reduce stress, control anxiety and quell panic attacks. This sequence helps retain and gently accumulate carbon dioxide, leading to calmer breathing and reduced anxiety. In other words, the urge to breathe will decline as you enter a more relaxed state:

1. Take a small breath into your nose, followed by a small breath out

2. Then hold your nose for five seconds in order to hold your breath, and then release your nose to resume breathing
3. Breathe normally for 10 seconds
4. Repeat the sequence

Master the Light, Effortless Breath

In addition to being slow and deep, ideally you want your breathing to also be very calm and light — so light that the hairs in your nose barely move. This type of breathing, which is part of the Buteyko school of thought, helps you to enter and remain in a calm, meditative state while lowering your blood pressure. The following three steps will help your breath become lighter with practice.

1. Place one hand on your upper chest and the other on your belly. Your belly should move slightly in and out with each breath, and your midsection should get wider, while your chest should remain unmoving
2. Close your mouth and breathe in and out through your nose. Focus your attention on the cold air coming into your nose and the slightly warmer air leaving it on the out breath
3. Slowly decrease the volume of each breath, to the point it feels like you're almost not breathing at all (you'll notice your breath getting very quiet at this point). The crucial thing here is to develop a slight air hunger. This simply means there's a slight accumulation of carbon dioxide in your blood, which signals your brain to breathe

You may feel a slight air shortage at first, but this should be tolerable. If it becomes uncomfortable, take a 15-second break and then continue. After three or four minutes of air hunger, you'll start experiencing the beneficial effects of CO₂ accumulation, such as an increase in body temperature and an increase in saliva. The former is a sign of improved blood circulation; the latter a sign that your parasympathetic nervous system has been activated, which is important for stress reduction.

Breathing Is a Cornerstone of Good Health

I recently interviewed Belisa Vranich — a clinical psychologist and author of “Breathe” — about her breathing program, which has been shown to improve physical and mental health in a short amount of time. There are two basic breathing styles: vertical and horizontal breathing. Chances are you're breathing vertically, because most people (with the exception of young children) do.

This type of breathing makes you feel a bit taller on the in-breath, as it raises your chest and shoulders, which actually triggers your sympathetic nervous system, essentially signaling your body that you're stressed out. As noted by Vranich, “If you're not already in a stressed-out state, it's going to make you more stressed.”

Correct breathing will cause your midsection to widen, while not raising your shoulders or puffing out the upper part of your chest. At first, you may find it difficult to take a proper breath, as your midsection may be too tight. An exercise that uses exaggerated motions to relearn proper breathing is as follows:

1. Begin by relaxing and unbracing your midsection
2. Take a deep breath in and actually feel the middle of your body get wider. Let your belly go
3. On the exhale, roll backward, tipping your hips underneath you while pressing your fingers gently into your belly, giving it a little squeeze

Eventually, this exercise will teach your body to use the diaphragm to breathe. Vranich also points out that, oftentimes, feeling short of breath is due to insufficient exhalation leaving excess residual air in your lungs. Engaging your diaphragm and intercostals — the muscles that run between your ribs, allowing your chest wall to move — will allow you to take more complete in and out breaths.

The condensed version of her interview is included above for your convenience. For the full interview, please see “Breathing Program to Improve Mental and Physical Health.”

Other Powerful Tools to Normalize Your Blood Pressure

Nitric oxide (NO) is a well-established biological signaling molecule that relaxes blood vessels. Most of us tend to have lower levels the older we get. In the video above, I demonstrate a simple three-

minute exercise that, if done three times a day, every day, will radically increase your NO production and help to normalize your blood pressure. It will work synergistically with the breathing exercises described above and other strategies discussed below.

Address insulin and leptin resistance

High blood pressure is typically associated with insulin resistance, which results from eating a diet too high in sugar. As your insulin level elevates, so does your blood pressure. Insulin stores magnesium, but if your insulin receptors are blunted and your cells grow resistant to insulin, you can't store magnesium so it passes out of your body through urination.

Magnesium stored in your cells relaxes muscles. If your magnesium level is too low, your blood vessels will constrict rather than relax, and this constriction raises your blood pressure.

Fructose also elevates uric acid, which drives up your blood pressure by inhibiting the NO in your blood vessels. (Uric acid is a byproduct of fructose metabolism. In fact, fructose typically generates uric acid within minutes of ingestion.) NO helps your vessels maintain their elasticity, so NO suppression leads to increases in blood pressure.

If you're healthy, and want to stay that way, the general rule is to keep your total fructose intake to 25 grams per day or less. If you're insulin resistant and/or have high blood pressure, keep your total fructose to 15 grams or less per day until your condition has resolved.

Eat real food

A processed food diet, loaded with net carbohydrates (non-fiber carbs like sugar, fructose and grains) and trans fat (margarines and vegetable oils) is a recipe for hypertension. Instead, make whole, ideally organic foods the focus of your diet.

Also remember to swap non-fiber carbs for healthy fats such as avocados, butter made from raw, grass fed organic milk, organic pastured egg yolks, coconuts and coconut oil, raw nuts such as pecans and macadamia, grass fed meats and pasture-raised poultry. To learn more about healthy eating, please see my optimal nutrition plan.

Mind your sodium to potassium ratio

According to Dr. Lawrence Appel, lead researcher on the DASH diet and director of the Welch Center for Prevention, Epidemiology and Clinical Research at Johns Hopkins, your diet as a whole is the key to controlling hypertension — not salt reduction alone.

He believes a major part of the equation is this balance of minerals — i.e., most people need less sodium and more potassium, calcium and magnesium. According to Appel: "Higher levels of potassium blunt the effects of sodium. If you can't reduce or won't reduce sodium, adding potassium may help. But doing both is better."

Indeed, maintaining a proper potassium to sodium ratio in your diet is very important, and hypertension is but one of many side effects of an imbalance. A processed food diet virtually guarantees you'll have a lopsided ratio of too much sodium to potassium. Making the switch from processed foods to whole foods will automatically improve your ratios.

Load up on veggies

Juicing is a simple way to increase the amount of vegetables in your diet, and many NO₃-rich veggies (which raise your NO level) are suitable for juicing, such as beets, kale, celery, spinach, carrots and more. Allicin-rich garlic, leeks, shallots and chives also help improve your blood pressure, and are easy to add to salads and various dishes.

Optimize your vitamin D level

To learn more about vitamin D testing, please see my previous article, "How Vitamin D Performance Testing Can Help You Optimize Your Health."

Boost your animal-based omega-3 intake

The best way to boost your omega-3 is to eat plenty of oily fish that are low in mercury and other pollutants. Good options include wild caught Alaskan salmon, sardines and anchovies. Alternatively, take a high-quality krill oil or fish oil supplement. Krill oil has certain advantages over fish oil, which is why I prefer it.

Consider intermittent fasting

Intermittent fasting is one of the most effective ways I've found to normalize your insulin/leptin sensitivity. It's not a diet in conventional terms, but rather a way of scheduling your eating in such a way as to promote efficient energy use. Essentially, intermittent fasting means eating your calories during a specific window of the day, and choosing not to eat food during the rest. When you eat, your body reacts by elevating insulin and leptin.

Exercise regularly

A comprehensive fitness program can go a long way toward regaining your insulin sensitivity and normalizing your blood pressure. To reap the greatest rewards, I recommend including high-intensity interval exercises in your routine. If you are insulin resistant, you'll also want to include weight training. When you work individual muscle groups, you increase blood flow to those muscles, and good blood flow will increase your insulin sensitivity.

I also recommend training yourself to breathe through your nose when exercising, as mouth breathing during exercise can raise your heart rate and blood pressure, sometimes resulting in fatigue and dizziness. To learn more about this, please refer to my previous article on the Buteyko breathing method.

Avoid smoking and other forms of pollution

Smoking is known to contribute to high blood pressure, as are other forms of air pollution, and even noise pollution. To address these, avoid smoking, consider using ear plugs during sleep if you live in a noisy neighborhood (provided you cannot move), and take steps to improve your indoor air quality.

Walk barefoot

Going barefoot will help you ground to the Earth. Experiments show that walking barefoot outside (also referred to as Earthing or grounding) improves blood viscosity and blood flow, which helps regulate blood pressure. So, do yourself a favor and ditch your shoes now and then.

Grounding also calms your sympathetic nervous system, which supports your heart rate variability. This in turn promotes homeostasis, or balance, in your autonomic nervous system. In essence, anytime you improve heart rate variability, you're improving your entire body and all of its functions.

Emotional Freedom Techniques (EFT)

The connection between stress and hypertension is well documented, yet still does not receive the emphasis it deserves. In fact, it has been shown that people with heart disease can lower their risk of subsequent cardiac events by over 70 percent simply by learning to manage their stress.

Suppressed negative emotions such as fear, anger and sadness can severely limit your ability to cope with the unavoidable every day stresses of life. It's not the stressful events themselves that are harmful, but your lack of ability to cope.

The good news is, strategies exist to quickly and effectively transform your suppressed, negative emotions, and relieve stress. My preferred method is Emotional Freedom Techniques (EFT), an easy to learn, easy to use technique for releasing negative emotions.

EFT combines visualization with calm, relaxed breathing, while employing gentle tapping to "reprogram" deeply seated emotional patterns.

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