

Daily Breathing Exercises Could Reduce Heart Attack Risk

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✓ Fact Checked

June 22, 2023

STORY AT-A-GLANCE

- › Using slow breathing methods to help you relax can lower your blood pressure, thereby reducing your risk of related heart attack, stroke and heart disease
- › Engaging in slow, deep breathing for just two minutes lowers systolic blood pressure by 8.6 mmHg and diastolic blood pressure by 4.9 mmHg among people with high blood pressure
- › Slow breathing refers to 10 breaths per minute or less “with prolonged, rhythmic, slow and deep expiratory periods”
- › Spending just five minutes on focused breath training can also help lower blood pressure
- › Slow breathing causes biochemical changes that induce relaxation, including increasing endorphins and lowering adrenaline and blood acidity, while deepening the volume of inspiration and expiration, maximizing the amount of oxygen entering the bloodstream

Using slow breathing methods to help you relax can lower your blood pressure, thereby reducing your risk of related heart attack, stroke and heart disease. Breathing exercises offer a non-pharmacological method for reducing high blood pressure,¹ making them useful for the 1.28 billion people affected by this condition worldwide.²

Among them, about half are unaware that their blood pressure is high. This is why high blood pressure is often referred to as the "silent killer." Often, people don't know their blood pressure is in an unhealthy range until complications occur. Fortunately, breathing

exercises can be practiced by anyone, any time, providing a simple way to help manage the condition.

Further, there's no downside to trying them, so there's good reason to give breathing exercises a chance, even if you haven't been diagnosed with high blood pressure.

Reduce Blood Pressure With Slow Breathing

Engaging in slow, deep breathing for just two minutes lowers systolic blood pressure (SBP) by 8.6 mmHg and diastolic blood pressure (DBP) by 4.9 mmHg among people with high blood pressure, according to a 2005 study.³ Slow breathing refers to 10 breaths per minute or less "with prolonged, rhythmic, slow and deep expiratory periods."

This causes biochemical changes that induce relaxation, including increasing endorphins and lowering adrenaline and blood acidity. Slow breathing "increases the length of the diaphragm contraction, minimizes the respiratory rate, and deepens the volume of inspiration and expiration, thus maximizing the amount of oxygen entering the bloodstream," researchers wrote in *Frontiers in Physiology*, and this is only the beginning.⁴

The team conducted a scoping review of 20 studies, which also revealed slow breathing's blood pressure benefits. They found systolic blood pressure declined by 4 to 54.22 mmHg, while diastolic blood pressure decreased by 3 to 17 mmHg among study participants aged from 18 to 75.⁵

One way slow breathing works is via its effect on the autonomic nervous system (ANS). Your ANS controls both your body's sympathetic nervous system (SNS) – the part that triggers your "fight-or-flight" response – as well as its parasympathetic nervous system (PNS), which triggers the relaxation response.

Any type of external stressor – everything from an argument with a loved one to a night of lost sleep – will prompt a reaction from the ANS, which signals to your brain's hypothalamus to either ramp up into overdrive or calm down.⁶

An imbalanced ANS — specifically increased SNS activity and decreased PNS activity, plays a role in the development of high blood pressure,⁷ but slow breathing helps remedy this. The Frontiers in Physiology team explained:⁸

"According to research, slow breathing lowers sympathetic tone and raises parasympathetic tone. This could be partially mediated by alterations in intrathoracic pressure, stimulation of arterial and cardiopulmonary baroreceptors and pulmonary afferent stretch receptors or by central interactions between respiratory and cardiovascular centers in brainstem modulation of vagal activity during breathing."

Five-Minute Breathing ‘Workout’ for Blood Pressure Health

Spending just five minutes on focused breath training can also help lower blood pressure, according to a separate study by researchers from the University of Colorado Boulder and the University of Arizona.

The team split 128 adults aged 18 to 82 years into two groups. One group did high-resistance inspiratory muscle strength training (IMST) training consisting of 30 breaths a day for six weeks. The other group did a low-resistance sham breathing exercise for the same period.⁹

IMST is used for recovery in people who have been on a ventilator, as well as to support breathing in those with asthma, chronic obstructive pulmonary disease and other breathing disorders.¹⁰ While no changes in SBP or DBP occurred in the placebo group, those doing the high-resistance breathing exercise had an average reduction of 9 mmHg in systolic blood pressure.¹¹

According to study author Daniel Craighead, the reduction is similar to what may be achieved with medication and potentially more effective than weight loss or reducing sodium in your diet. He told Insider, "People can expect fairly rapid results. We would expect that if you went longer, blood pressure would go down even more." He

recommended the technique for those with high blood pressure and those hoping to prevent it:¹²

"What's really exciting about this is that it's helpful for a wide range of adults. People with blood pressure at an unhealthy level could stand to benefit from adding this to their routine now. But someone could start in their thirties and stick to it for years to help delay or prevent hypertension."

The breathing exercise takes just five to 10 minutes a day, with benefits noticeable within two weeks. It involves the use of an inhaler-like device, which provides resistance as you take a breath, causing your respiratory muscles to get a workout. While the trial used a \$500 device, less expensive models are commercially available.¹³

According to the study, "These compiled findings from multiple independent trials provide the strongest evidence to date that high-resistance IMST evokes clinically significant reductions in SBP and DBP."¹⁴

Also noteworthy, the participants did the breathing exercises for six weeks, then took a six-week break. When their blood pressure was tested after the break, it was nearly as low as it was immediately after the exercise session ended. The researchers are also looking into whether a "maintenance dose" of the breathing exercise could help extend the blood pressure reductions even longer.¹⁵

Stress Raises Blood Sugar Levels – Can Breathing Help?

Stress and anxiety activate the SNS response that plays a role in high blood pressure as well as blood sugar levels. When you're stressed, it causes the SNS to release hormones such as norepinephrine and epinephrine, which stimulate glucose produce and reduce insulin, affecting your blood sugar levels.¹⁶

Stress is another factor in high blood pressure and relieving it may offer some relief. This is another mechanism by which controlled breathing may help blood pressure. The way you breathe – whether fast or slow, shallow or deep – is intricately tied to your

body as a whole, sending messages that affect your mood, your stress levels and even your immune system.

In early 2017, researchers discovered breathing may directly affect your brain activity, including your state of arousal and higher-order brain function.¹⁷ As such, controlled breathing exercises may modify stress coping behaviors and initiate appropriate balance in cardiac autonomic tone, which is a term that describes your heart's ability to respond to and recover from stressors.¹⁸

By lowering stress levels, breathing exercises could therefore help not only your blood pressure but also potentially your blood sugar levels.

Breathing Exercises Lower Oxidative Stress

Excessive oxidative stress (OS) leads to an accumulation of free radicals and inflammation linked to aging and disease. But breathing exercises are known to improve oxidative stress in healthy young adults as well as those with diabetes, high blood pressure and chronic obstructive pulmonary disease.¹⁹

Further, in a systematic review and meta-analysis, breathing exercises increased protective superoxide dismutase (SOD) and glutathione (GSH) activities and decreased malondialdehyde, an oxidation product. The researchers, from Weifang Medical University in China, explained:²⁰

"SOD is converted into hydrogen peroxide by catalyzing oxygen reduction, which is then converted to water by GSH. It can effectively remove oxygen free radicals, protect endothelial cells from damage, relax vascular smooth muscle by increasing NO [nitric oxide] release, thus achieving the purpose of lowering OS."

Different Types of Breathing Exercises

There are many different types of breathing techniques available. Some, like IMST, involve using a device to assist you in slowing down your breathing. RESPeRATE is another form of device-guided slow breathing found to "significantly lower BP." According to a scientific statement from the American Heart Association:²¹

"One device has received US Food and Drug Administration approval for over-the-counter distribution "for use in stress reduction and adjunctive treatment to reduce blood pressure." This interactive system uses a belt around the thorax to monitor breathing rate, which feeds real-time data into a small battery-operated controller box, which in turn generates musical tones into headphones, corresponding to inspiration and expiration.

Studies support that most people find it easy to use the device and experience a prompt and effortless reduction in respiratory rate as they match their breathing pattern to the musical notes."

The downside of such devices is they cost hundreds of dollars. But there are other options available that don't cost anything. At the most basic level, you can start by breathing only through your nose.

This helps you avoid mouth breathing, which tends to promote hyperventilation, decreasing tissue oxygenation. Mouth breathing can also elevate your heart rate and blood pressure, sometimes resulting in fatigue and dizziness.²² The Buteyko Breathing Method is one way to reverse health problems associated with improper breathing, the most common of which include over-breathing and mouth breathing.

When you stop mouth breathing and learn to bring your breathing volume toward normal, you have better oxygenation of your tissues and organs. The Buteyko Breathing Method allows you to retain and gently accumulate CO₂, which calms breathing and reduces anxiety:

1. Take a small breath into your nose, followed by a small breath out
2. 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

More Simple Breathing Techniques

There are other options you can try as well. Box breathing is one such technique that triggers the parasympathetic nervous system to help manage stress. This technique, also called square breathing or four-square breathing, is used by Navy SEALs to help reduce stress in high-pressure situations.

It involves nose breathing to slow over-breathing and raise CO₂ levels to balance oxygenation. To begin practicing box breathing, get in a quiet place where you can concentrate and maintain good posture. Work up to using the technique for five-minute increments:²³

- **Step 1** – Begin by exhaling the air out of your lungs to a slow count of four. Some recommend exhaling through your mouth, others through your nose.
- **Step 2** – Hold your breath for a slow count of four.
- **Step 3** – Inhale slowly to a slow count of four through your nose, keeping your back straight and breathing through your abdomen so your shoulders do not rise.
- **Step 4** – Hold your breath for a slow count of four and return to step 1.

You can also try the 4-7-8 method, known for relaxation and promoting restful sleep.²⁴ First, exhale all your breath. Then inhale through your nose to a count of four. Hold your breath for seven seconds, then exhale, making a whoosh sound, for a count of eight. Repeat the process three times.

There are also specialized forms of yogic breathing, such as nadi shodhana, or alternate nostril breathing.²⁵ To try it, use your right thumb to close the right nostril, then inhale through your left nostril. Next, close the left nostril and exhale through the right. The next inhalation should be done through right nostril. Then, close the right nostril and

breath out through your left nostril. This is one round. You can repeat the procedure for the desired number of rounds.

As noted by the Frontiers in Physiology team, "Slow deep breathing is easy for people of all ages and does not have to be expensive."²⁶ This is what makes it such a useful tool to embrace, not only for lowering blood pressure and related heart attack risk but also for general relaxation, stress relief and well-being.

Sources and References

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- ¹⁶ [Cureus. 2019 Aug; 11\(8\): e5474](#)
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- ²⁶ [Front Physiol. 2023; 14: 1048338., Conclusions](#)