

# Top Breathing Techniques for Better Health

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## STORY AT-A-GLANCE

- › The way you breathe — fast or slow, shallow or deep — sends messages to your body that affect your mood, stress level, blood pressure, immune function and more
- › One of the most basic of all breathing techniques is to make sure you're always breathing through your nose. Mouth breathing decreases tissue oxygenation, elevates your heart rate and blood pressure and has many other adverse health effects
- › Most people chronically over breathe. Breathing less is a sign of better health. Conversely, the more you breathe, the more likely you are to experience significant health problems
- › Another near-universal breathing abnormality is breathing vertically rather than horizontally, which triggers your sympathetic nervous system and makes you feel stressed
- › Several breathing techniques are reviewed, including proper breathing basics, a technique to improve your body's tolerance to carbon dioxide, the 4-7-8 breathing method to improve sleep, the Buteyko Breathing Method to ease stress and anxiety, and many more

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Breathing wields incredible power over your health, as it supplies your body with oxygen and removes excess carbon dioxide (CO<sub>2</sub>) to keep you alive. However, the way you

breathe – whether fast or slow, shallow or deep – also sends messages to your body that affect your mood, stress level, blood pressure, immune function and more.

What's interesting about breathing is that it's both a voluntary and an involuntary process. While your body breathes automatically, you also have the ability to consciously control your breathing – the speed, the depth and whether you breathe through your mouth or your nose.

So, simply by changing the way you breathe, you can actually influence your health in a variety of ways. Here, I review some of the most important basics of proper breathing, and share several effective controlled breathing techniques shown to have a positive impact on health and psychological well-being.

## **Always Breathe Through Your Nose – Even During Exercise**

Perhaps the most basic of all breathing techniques is to make sure you're always breathing through your nose. Mouth breathing tends to promote hyperventilation, which actually decreases tissue oxygenation. Mouth breathing also results in diminished levels of CO<sub>2</sub> in your body and a decreased ability to filter toxic pollutants from the air.

Your body needs a balance of oxygen and CO<sub>2</sub> for optimal function. CO<sub>2</sub> is not just a waste product but has actual biological roles, one of which is assisting in oxygen utilization. When your CO<sub>2</sub> level is too low, changes in your blood pH impair your hemoglobin's ability to release oxygen to your cells (the Bohr effect).<sup>1,2</sup>

Mouth breathing can also elevate your heart rate and blood pressure, sometimes resulting in fatigue and dizziness.<sup>3</sup> The elasticity of your lungs also depends on nasal resistance, which you only get from nasal breathing due to the smaller diameter of your nasal passages.<sup>4</sup> Poor breathing is even associated with poor posture.

So, breathing through your nose helps maintain your health in a number of important ways. While huffing and puffing through your mouth may be particularly tempting during physical exertion, really try to avoid this tendency. You should be exercising only to the extent that you can continue breathing through your nose the vast majority of the time.

If this means backing off on intensity, then that's what you need to do, realizing that it's only temporary until your body begins to adjust to your slightly increased CO2 levels, which will happen fairly quickly. You just have to get used to "air hunger" (an admittedly uncomfortable feeling of mild suffocation), and realize it's normal and safe.

So, the rule of thumb is to not push yourself to the point where you are unable to maintain nasal breathing. If you feel the need to open your mouth, then slow down and recover. This helps your body to gradually develop a tolerance for increased CO2.

## Assess Your CO2 Tolerance

There's a simple self-test for estimating your body's tolerance to CO2. Dr. Konstantin Pavlovich Buteyko,<sup>5</sup> a Russian physician, discovered that the level of CO2 in your lungs correlates to your ability to hold your breath after normal exhalation. You can use a stopwatch or simply count the number of seconds to yourself. Here is the process:

1. Sit straight without crossing your legs and breathe comfortably and steadily.
2. Take a small, silent breath in and out through your nose. After exhaling, pinch your nose to keep air from entering.
3. Start your stopwatch and hold your breath until you feel the first definite desire to breathe.
4. When you feel the first urge to breathe, resume breathing and note the time. The urge to breathe may come in the form of involuntary movements of your breathing muscles, or your tummy may jerk or your throat may contract.
5. Your inhalation should be calm and controlled, through your nose. If you feel like you must take a big breath, then you held your breath too long.

The time you just measured is called the "control pause" or CP, which reflects the tolerance of your body to carbon dioxide. Here are the criteria for evaluating your CP:

- **CP 40 to 60 seconds** – Indicates a normal, healthy breathing pattern and excellent physical endurance.

- **CP 20 to 40 seconds** – Indicates mild breathing impairment, moderate tolerance to physical exercise and potential for health problems in the future (most folks fall into this category).

To increase your CP from 20 to 40, physical exercise is necessary. You might begin by simply walking with one nostril occluded. As your CP increases, begin incorporating jogging, cycling, swimming, weightlifting or anything else to build up an air shortage.

- **CP 10 to 20 seconds** – Indicates significant breathing impairment and poor tolerance to physical exercise; nasal breath training and lifestyle modifications are recommended. If your CP is less than 20 seconds, never have your mouth open during exercise, as your breathing is too unstable. This is particularly important if you have asthma.
- **CP under 10 seconds** – Serious breathing impairment, very poor exercise tolerance and chronic health problems.

Short CP times correlate with low tolerance to CO<sub>2</sub> and chronically depleted CO<sub>2</sub> levels. As a result, the shorter your CP, the more easily you'll get breathless. The good news is that you will feel better and improve your exercise endurance with each five-second increase in your CP.

## **Improve Fitness and Endurance by Raising Your CO<sub>2</sub> Tolerance**

The first step to increase your CP is to learn how to unblock your nose with the following breath hold exercise. While this exercise is perfectly safe for most, if you have any cardiac problems, high blood pressure, are pregnant, have Type 1 diabetes, panic attacks or any serious health concern, then do not hold your breath beyond the first urges to breathe.

- Sitting up straight, take a small breath in through your nose and a small breath out. If your nose is quite blocked, take a tiny breath in through the corner of your mouth.

- Pinch your nose with your fingers and hold your breath. Keep your mouth closed.
- Gently nod your head or sway your body until you feel that you cannot hold your breath any longer.
- When you need to breathe in, let go of your nose and breathe gently through it, in and out, with your mouth closed.
- Calm your breathing as soon as possible. Repeat this exercise several times in succession, waiting 30 to 60 seconds between rounds. Also, be sure to do it on a regular basis, ideally daily.

## **Breathe Less and More Lightly**

While "breathe less" might sound like a terrible recommendation, most people chronically over breathe, meaning they breathe more than is needed, which depletes their carbon dioxide reserves. Typical characteristics of over breathing include mouth breathing, upper chest breathing, sighing, noticeable breathing during rest, and taking large breaths prior to talking.

Clinical trials<sup>6</sup> involving asthmatics show they breathe between 10 to 15 liters of air per minute and people with chronic heart disease tend to breathe between 15 to 18 liters of air per minute. On the other hand, normal breathing volume is between 4 and 7 liters of air per minute, which translates into 12 to 14 breaths.

This suggests breathing less is a sign of better health. Conversely, the more you breathe, the more likely you are to experience significant health problems. What's more, if you are breathing through your mouth during the day, odds are you're also doing so at night, which can lead to health problems such as dehydration, snoring and sleep apnea.<sup>7,8,9,10,11,12</sup> Mouth breathing is associated with several other health problems, including:

- Bronchial asthma and exercise-induced asthma — In one study,<sup>13</sup> asthma patients had remarkably reduced asthma after exercising while breathing through their

noses. However, they did experience moderate bronchial constriction after exercising while mouth breathing.

- Abnormal facial development – Children who breathe through their mouths tend to develop longer faces with altered jaw structures.<sup>14,15,16,17,18,19</sup>
- Poor oral hygiene – Loss of moisture dries out your saliva and contributes to poor oral hygiene; dehydration causes your airways to constrict and makes nose breathing even more difficult, creating a vicious cycle.
- Reduced oxygen delivery to your heart, brain and other tissues due to constricted arterial blood flow.<sup>20</sup>
- Crooked teeth, poor concentration, allergies, poor sports performance and ADHD have also been linked with mouth breathing.

The trick to minimize these problems is to breathe more lightly, and this happens automatically when you shift from breathing through your mouth to your nose. Remember, the deeper and more quickly you breathe, the more constricted your blood vessels will be and the less oxygen will be delivered to your tissues.<sup>21</sup>

Breathing through the nose, on the other hand, slows down and regularizes your breathing, thereby improving oxygenation. Nasal breathing also has a calming effect because it activates your parasympathetic nervous system.<sup>22,23</sup>

## **Three Steps to Proper Breathing**

The following steps will help your breath become lighter, such that the hairs in your nose barely move. Again, this type of light breathing helps you to enter and remain in a calm, meditative state while lowering your blood pressure and reducing nasal congestion for easier breathing.

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.

1. Place one hand on your upper chest and the other on your belly; feel your belly move slightly in and out with each breath, while your chest remains 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.

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.

## **Breathe Horizontally, Not Vertically**

Another near-universal breathing abnormality is breathing vertically rather than horizontally. This is something clinical psychologist Belisa Vranich points out in her book "Breathe," which details her breathing program.

Vertical breathing makes you feel a bit taller on the in-breath, as it raises your chest and shoulders. The problem is that this kind of breathing actually triggers your sympathetic nervous system, basically signaling your body that you're stressed.

Correct breathing will cause your midsection to widen, while not raising your shoulders or puffing out the upper part of your chest. This is the horizontal breath. At first, you may find it difficult to take a proper breath, as your midsection and diaphragm may be tight. To relearn proper horizontal breathing, Vranich suggests the following exercise:

- Begin by relaxing and unbracing your midsection.

- Take a deep breath in and actually feel the middle of your body get wider. Let your belly go.
- 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. A related problem here is feeling short of breath, which is caused by insufficient exhalation that leaves 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. You can also train yourself to exhale more fully by making sure your exhale is slightly longer than your inhale, and by engaging your diaphragm to really squeeze the air out as you allow your midsection to collapse inward.

In the 4-7-8 exercise below, for example, your exhale is twice as long as your inhale. The condensed version of Vranich's interview is included above for your convenience.

## **Improve Sleep With the 4-7-8 Breathing Exercise**

Deep breathing activates your parasympathetic nervous system, which induces the relaxation response.<sup>24</sup> There are many different breathing practices that will accomplish this, but the following is both powerful and easy to perform.

I first learned this exercise when I attended a presentation by Dr. Andrew Weil at the 2009 Expo West in California. Here's a quick summary of the process.<sup>25</sup> Weil also demonstrates the technique in the video above.

1. Sit up straight.
2. Place the tip of your tongue up against the back of your front teeth. Keep it there through the entire breathing process.
3. Breathe in silently through your nose to the count of four.



4. Hold your breath to the count of seven.
5. Exhale through your mouth to the count of eight, making an audible "whoosh" sound.
6. That completes one full breath. Repeat the cycle another three times, for a total of four breaths.

You can do this 4-7-8 exercise as frequently as you want throughout the day, but it's recommended you don't do more than four full breaths during the first month or so of practice. Later you may work your way up to eight full breath cycles at a time. The benefits of this simple practice are enormous and work as a natural tranquilizer for your nervous system.

## **Ease Stress and Anxiety With Controlled Breathing**

Another powerful technique is the Buteyko Breathing Method, which will help reverse health problems associated with improper breathing, the most common of which are overbreathing and mouthbreathing. When you stop mouthbreathing and learn to bring your breathing volume toward normal, you have better oxygenation of your tissues and organs, including your brain.

The Buteyko Breathing Method and many other controlled breathing methods are also very effective for controlling anxiety and quelling panic attacks. As reported by Scientific American:<sup>26</sup>

*"[R]espiratory techniques do not work only for acute stresses or sleep problems; they can also relieve chronic anxiety. They are particularly effective in people with psychiatric disorders such as phobias, depression and post-traumatic stress disorder ...*

*Breathing exercises also help to counter the accumulation of minor physical tension associated with stress. Therapists recommend doing them regularly during the day, during breaks or at moments of transition between two*

*activities: you simply stop to adjust your posture and allow yourself a few minutes of quiet breathing.*

*Therapists often suggest the '365 method': at least three times a day, breathe at a rhythm of six cycles per minute (five seconds inhaling, five seconds exhaling) for five minutes. And do it every day, 365 days a year.*

*Some studies even suggest that, in addition to providing immediate relief, regular breathing exercises can make people less vulnerable to stress, by permanently modifying brain circuits."*

Research<sup>27</sup> also shows the relaxation response enhances "expression of genes associated with energy metabolism, mitochondrial function, insulin secretion and telomere maintenance," and reduces "expression of genes linked to inflammatory response and stress-related pathways."

Scientific American lists six breathing techniques shown to relieve stress, anxiety and panic attacks, including alternate nostril breathing and abdominal breathing. The Buteyko Breathing Method is also indicated for this, as it allows you to retain and gently accumulate CO<sub>2</sub>, 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

## **For Better Health, Control Your Breath**

Typically, the respiratory rate of humans is about 10 to 20 breaths per minute. Slowing your breathing down to a rate of four to 10 breaths per minute appears to offer many benefits, however, including effects on the respiratory, cardiovascular, cardiorespiratory and autonomic nervous systems.<sup>28</sup>

Further, according to research<sup>29</sup> published in the medical journal *Breathe*, optimized respiration in humans may be in the range of six to 10 breaths per minute, done in a way that activates your diaphragm. The researchers also note that nasal breathing (such as taught by the Buteyko method) "is also considered an important component of optimized respiration," and that:

*"Controlled, slow breathing appears to be an effective means of maximizing HRV [heart rate variability] and preserving autonomic function, both of which have been associated with decreased mortality in pathological states and longevity in the general population ...*

*This is easily achievable in most individuals with simple practice and there is yet to appear in the literature any documented adverse effects of respiration in the 6 to 10 breaths per minute range."*

Aside from the techniques already mentioned, there are many others. Following is a short list of a few additional breathing methods you can try, all of which are backed by scientific evidence<sup>30</sup> showing their beneficial influence on human health.

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**Nadi Shodhana/Nadi Shuddhi (alternate nostril breathing)** – With your right thumb, close the right nostril and inhale through your left nostril. Closing the left nostril, exhale through the right, following which, inhalation should be done through the right nostril. Closing the right nostril, breathe out through your left nostril. This is one round. The procedure is repeated for the desired number of rounds.

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**Surya Anuloma Viloma (right uninostril breathing)** – Closing the left nostril, both inhalation and exhalation should be done through your right nostril, without altering the normal pace of breathing.

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**Chandra Anuloma Viloma (left uninostril breathing)** – Similar to Surya Anuloma Viloma, breathing is done through your left nostril alone, by closing the right nostril.

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**Surya Bhedana (right nostril initiated breathing)** – Closing the left nostril, inhalation

should be done through your right nostril. At the end of inhalation, close the right nostril and exhale through the left nostril. This is one round. The procedure is repeated for the desired number of rounds.

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**Ujjayi (psychic breath)** – Inhalation and exhalation are done through the nose at a normal pace, with partial contraction of the glottis, which produces a light snoring sound. You should be aware of the passage of breath through your throat during the practice.

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**Bhramari (female honeybee humming breath)** – After a full inhalation, closing the ears using your index fingers, you should exhale making a soft humming sound similar to that of a honeybee.

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