

Breathing for Health: Breathwork and Breath Control

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The way you breathe can affect you physically and mentally because there are close ties between breathing and the part of the nervous system that controls the involuntary mechanisms of the body. As discussed in the previous article of this series, it is the correct *balance* of oxygen to carbon dioxide (CO₂) in the blood that is important. Many consumer sources of information claim that lots of deep breathing with the diaphragm is healthy, ridding the body of toxins and increasing the supply of oxygen to the blood. In fact, there is considerable scientific evidence that too much oxygen is actually more harmful than slightly more CO₂ in the balance.

In a typical day, people often become very focused on a task and hold their breath or forget to breathe properly.¹ Shallow chest breathing is also common. When the demands of the body require little oxygen, such as when we are resting, sleeping, or working at the computer, breathing naturally becomes slower.² However, shallow chest breathing and forgetting to breathe is not healthy. If you need something to help you remember to be aware of your breathing, there are numerous options: 1) a small battery-operated timer from www.breathminder.com for \$20 that has a silent reminder and comes with instructions on 4-7-8 breathing¹, as discussed later in this article, 2) a basic “egg” timer, 3) a countdown timer available on many watches, or 4) a break reminder on your computer.

Why Bother?

Breathing is truly a bridge between the mind and the body.³ Practicing breathing techniques can have a powerful effect on blood pressure, a racing heart, or a frantic mind. Breathing affects the Autonomic Nervous System.³ For example, if you breathe as if you are calm, you will become calm.

Catching Air

There is a considerable dispute over using the diaphragm, the ribcage, or the shoulders in breathing. Breathing techniques often emphasize use of the diaphragm, but it is actually healthy and natural to use all three body parts because they are all important in expanding and contracting the chest cavity.^{4,5,6} In traditional Yogic breathing, the breath starts with the diaphragm, and continues up through the ribcage area and into the shoulders.⁶ If you are breathing shallowly into your upper chest, you are not using your full lung capacity down into your abdomen. Correcting your posture and breathing into your abdomen will increase the effectiveness of each breath.^{5,7,8,9} Chest breathing is very inefficient because there is less blood flow in the upper lobes of the lungs.⁵ There is much more blood flow and oxygen transfer in the lower lobes of the lungs.⁵

Correct Posture

Posture is important when you breathe.⁴ Breathing is not as efficient or effective if you are in an awkward position. Movement of the body, including the expansion and contraction of the chest cavity, can help prevent computer-related injuries.⁴

Notice all of the movements of your spine and body when you inhale and exhale.⁴ As you inhale, imagine a balloon in your belly, and notice your spine straightening. As you exhale, allow your head and seat to naturally move closer together.⁴ These are small movements, but being aware of them and how they affect your body is viewed by many as movements of energy within your body.⁴

A good way to realign your spine and open your chest for breathing is to roll up a towel and place it on the floor.¹⁰ Lie down with the towel lengthwise along your spine.¹⁰ Over time, lying in this position will help your shoulders drop back towards the floor and your head may move back into a better position.¹⁰ There is a foam roll in the Away-sis (AG331) for this purpose. If you find this position painful or uncomfortable, you should adjust the towel to a more comfortable position. If it continues to be uncomfortable, consult a health care practitioner to find out the source of the problem. This should not be an uncomfortable position!

Clear Nose and Sinuses

It is important to have clear nasal passages and sinuses in order to breathe effortlessly.² Although it seems strange to most Westerners, the use of a neti pot or nasal irrigation can be very helpful, especially for people with allergies and asthma.^{2,11} It can also reduce sinus infections and the need for medication.¹¹ In this method, a mild saline solution (1/4 teaspoon of plain non-iodized table salt to 1 cup lukewarm water) is poured into one nostril so it runs out the other. You might initially be revolted by this concept if you have inhaled water while swimming, but people with the same experience have tried it with huge success. Normal, healthy breathing is restored and sinuses become completely clear. Nasal irrigation can be used as often as needed without the side-effects of medicines. If water gets trapped in the sinuses after using the neti, tilt your head in various positions to drain them, or try dropping your head down to your knees for a few seconds and stand up (with Kleenexes ready).

Breathing Techniques

Many breathing techniques have been a part of meditation, spiritual practices, and cultures for hundreds or thousands of years. New techniques may or may not be credible, since selling breathing workshops and videos has become a money-making enterprise rather than a spiritual practice. There is much misinformation about breathing.

There are two types of breathing techniques: Deep Breathing and Rhythmic/controlled breathing, such as Pranayama and Sudarshan Kriya, Qigong, Eucapnic Buteyko, Holotropic breathwork and Dr. Andrew Weil's breathwork.

Deep breathing

Simply breathing deeply using the diaphragm is encouraged in an alarming number of websites, books, and articles.^{5,12} Breathing deeply often or too fast can result in hyperventilation, which has serious negative effects.^{7,137} However, an occasional deep breath is not going to wreak havoc on your body or your Autonomic Nervous System. In fact, a couple of long, slow deep breaths has a calming effect, which we tend to do naturally by sighing.⁵

Hyperventilation induces sympathetic stimulation and results in a large number of changes in circulation, gastrointestinal effects, and emotional responses sometimes including panic attacks and epileptic seizures.¹³ Although oxygen is very important, it appears that a surplus of oxygen from rapid breathing causes potentially dangerous responses, especially if you are prone to epilepsy, heart conditions, panic, asthma, glaucoma, cancer or high blood pressure.¹⁴ Before proceeding, we caution that casual and uninformed practice of deep or rapid breathing is not advised.

We recommend that you use one of the controlled breathing techniques discussed below since they are less likely to have harmful effects on your body.

Rhythmic/controlled breathing – Ancient techniques

Pranayama and Sudarshan Kriya

Breathing exercises are called Pranayama in yogic practice. The word prana has two meanings: breath and soul.² In the word Pranayama, it means breath, although the two are obviously linked.²

Pranayama techniques have been practiced for centuries in India.² The origins of pranayama stem from the ideas that our life span is dependent on how many times we breathe. In order to live longer, we must reduce the number of breaths we take.²

One of the basic presumptions of yoga is that the breath (prana) and the mind (chitta) are not separate, but actually different expressions of a single entity.² Everything that leads to contentment, happiness and enjoyment is a result of a peaceful mind and our reaction to the world around us.² Although it is very difficult to control the mind directly, it can be controlled indirectly by controlling the breath. When the breath is silenced, so is the mind.² Yogis control breath to have peace of mind.

Of course not every disorder can be cured with Pranayama. The deepest benefits achieved by yogis require total devotion and an ascetic life, but Pranayama has proven to be extremely helpful even when the techniques are adapted to the average person.²

Sudarshan Kriya (SK) has been described as a crash course in Pranayama.¹⁵ It makes Pranayama accessible to the average person with a career, kids, and other interests. SK is a yogic breathing technique of well defined sequence of rhythmic breathing with paced breathing at varying rates and depths interspersed with definite pauses.^{13,16} The specific rhythms of breath used in SK have been used to eliminate stress, support the various organs and systems within the body, transform overpowering emotions, and restore peace of mind.¹⁶ One study using physicians and medical researchers as subjects found that

those in the group practicing SK displayed significantly greater mental alertness (beta activity in the left frontal, occipital, and midline regions of the brain; $p < 0.05$) than those who did not. Several studies have demonstrated significant falls in cortisol levels among those who regularly practice SK (note: cortisol is a stress hormone).¹⁶

Other research has found in people who practice SK:

- A significantly higher level of natural killer cells in cancer patients ($p < 0.001$).¹⁶
- Improved antioxidant status and enhanced defense against oxidants.¹⁶
- Significant drops in total cholesterol and LDL (bad cholesterol) as well as increases in HDL (good cholesterol).¹⁶
- 65%-73% success rate in the treatment of depression determined by psychiatric evaluation and standard psychiatric measures, suggesting that SK normalizes patients' brain-wave patterns, increases a well-being hormone (prolactin), and is as effective as standard anti-depressant drugs, but without the cost and side-effects.¹⁶
- A reduced need for asthma medications.¹¹

There are three ways that breathing can be modified according to Pranayama practices:²

- By inhaling and exhaling rapidly and shallowly
- By inhaling and exhaling slowly taking long or deep breaths
- By stopping the act of breathing totally

There are many variations of Pranayama techniques involving the three modifications and use of alternate nostril breathing.² A steady, comfortable seated position is important in all of them. To explore these further, please refer to Reference IndianGyan.

Qigong

Qigong is one part of the practice of Tai Chi. Breathing is just one part of the practice of Qigong, but it is an essential part.

In Qigong, body postures, movements, sounds, and images are used in addition to breathwork.^{17, 18} Qigong breathing exercises incorporate various patterns of breathing in and out, and holding breath either after the inhale or after the exhale.¹⁸ It is important to visualize Qi (life energy) moving throughout the body as a warm, bright substance.¹⁸ Concentration requires smiling inwardly on your body and organs with loving appreciation, and outwardly, to the world around you to rid you of anger, fear, worries, and other emotions that may interfere with the free flow of Qi.¹⁸

Dantian is a point of focus during the practice of Qigong and other East Asian breathing techniques.^{19, 20} Dantian is capable of storing and generating Qi.²¹ Breathing through the nose with a closed mouth puts Qi in motion. The breathing exercises are used to move Qi through the passages of meridians and pulses of the body.²⁰ Qi can only be led, not pushed. The mind is the force that moves the Qi.²¹ The Dantian is usually located in three

different areas of the body.^{19,21, 22} Some exercises focus on all three dantian to activate circulation of Qi to these areas.²²

- The Lower Dantian is located in the abdomen, three finger widths below and two finger widths behind the navel between the bladder and the rectum.^{19, 20, 21} The lower dantian is associated with physical energy, digestion, elimination, reproduction and sometimes sexuality.^{19, 21, 22} It is known as the sea of air (Qihai) because all the passages/meridians meet there.²⁰ This lower region is generally the area of focus in discussions of breathing control.^{20, 21}
- The Middle Dantian is the Solar Plexus. It is associated with respiration and the health of internal organs.^{19, 21}
- The Upper Dantian is at the Third Eye, between the eyebrows. It is associated with consciousness, the brain, sensory organs, thinking and contemplation.^{19, 21, 22}

One study in 2002 suggested that Spring Forest Qigong (a very simple method) was effective in the treatment of major depression, bipolar disorder, and dysthymia.¹⁷ A review of research that studied the effect of Qigong on hypertension suggests that Qigong may have a positive effect.²³ One of the best studies of TaiChi as an exercise technique looked only at improvements in measures such as flexibility and functional performance and did not appear to focus on the benefits of breathing and the other associated relaxation and mental practices of Qigong.²⁴

A few other studies have looked at the use of Qigong as it benefited the health of humans and animals with regard to movement of Qi in healing.²⁵ From these studies, it is suggested that Qigong (not specifically breathwork) is quite effective in the prevention of stroke and deaths, alleviating various cerebro-cardiovascular risk factors in hypertensive patients. These studies also showed improved bodily functions of cancer patients (i.e., increased liver function, erythrocyte sedimentation, phagocytosis rate, and improved appetite).²⁵ Studies where Qigong masters treated animals resulted in smaller tumor size and increased lifespan in cancerous mice, and increased survival rate of rats infected with pneumocystis (lung bacteria).²⁵

Modern Day Breathing Techniques

Eucapnic Buteyko

Dr. K.P. Buteyko, a Russian physician, developed the theory that chronic hyperventilation and the resulting depletion of carbon dioxide led to the development of defensive reactions in the body.²⁶ By assessing the length of time a person can hold their breath, the Buteyko method assesses the degree of depletion of CO₂.^{26, 27} The conclusion is that most people habitually hyperventilate and have chronically low CO₂ and alkaline blood levels.

Systematic breath holding and underbreathing to the point of experiencing a lack of air allows a rapid accumulation of CO₂ levels.^{26, 27} It is felt that this normalizes systems in

the body that have adapted to chronically low levels of CO₂ due to overbreathing or hyperventilation.²⁶

By training the body to tolerate hypoxia (lack of oxygen), the theory holds that it makes the body better able to utilize oxygen.²⁶ This is true with regard to the Bohr effect based on the information we discussed in the first article. Athletes experience this when they train at high altitude because the body can then utilize oxygen more efficiently at sea level.²⁶

The term Eucapnic breathing is used to refer to the breathing techniques that attempt to normalize CO₂. They utilize the concepts of the Buteyko method but take a broader, more eclectic approach.²⁶ Eucapnic breathing emphasizes hypoventilation techniques to encourage adaptive changes in the body, but also stress the importance of nutrition, exercise, and stress reduction in overall health of the body.²⁶

Holotropic breathwork

Holotropic breathwork uses a certified facilitator guiding an individual to produce altered states of consciousness.^{28,29} This technique utilizes evocative music, art, energy release work, and group sharing.²⁸ The technique was developed by psychiatrist Stanislav Grof, M.D. and Christina Grof in the mid-1970s.^{28,29} The sessions are fairly open-ended, using breathwork to assist people in reconnecting with their self, others, natural world, and spirit. It allows the breath to heal the body and the mind.^{28,29} Participants are not coached on any particular method of breathing.²⁸ The session is largely non-verbal unless the participant feels “stuck” in some way, at which time the facilitator intervenes to help amplify the symptoms being experienced.^{28,29} Certification in the Grof Technique requires 600 hours of residential training that takes 2 years to complete.²⁸ From the description of training,²⁸ it is difficult for us to determine whether it includes education in the physiology behind breathwork and its impact on the Autonomic Nervous System. Therefore, we would advise caution if you have health problems that might be aggravated by hyperventilation

Dr. Weil's (and others) Breathwork

We don't have a classification for this breathwork other than that it is put forth by Dr. Andrew Weil, Joel McPherson (American Fitness Professionals Association), and the American Medical Student Association. It is partly based on ancient breathwork techniques and current research. The techniques are extremely easy to learn and can generally be practiced anywhere at any time. It definitely helps to set aside 10 minutes or more of quiet, undisturbed time in a comfortable place every day to practice these exercises and experience the full mind/body benefits. But they can be called into action any time, especially when you are feeling stressed, angry, or anxious. These are just three of many breathwork exercises you can use. If you find these helpful, please refer to the Resources section for more information.

1. 4-7-8^{Breathing1,301}

One of the easiest and best breathing techniques to master is 4-7-8 breathing. It is controlled, slow, and unlikely to result in a dangerous rise in blood oxygen levels. It is a

natural tranquilizer that can be used whenever you feel anxious, stressed, unable to sleep, or are not breathing as you focus on a task or reading too closely.

Follow these instructions: ^{1, 5, 30}

- Start by exhaling completely through your mouth.
- Close your mouth and inhale quietly through your nose to the count of 4.
- Hold your breath for a count of 7.
- Exhale completely through your mouth, making a whoosh sound to the count of 8.
- Repeat the cycle four times. Always inhale quietly through your nose and exhaling with a whoosh through your mouth.

In general, exhalation should be twice as long as inhalation.⁵

2. Breath awareness

Another exercise that can be practiced anywhere is a breath awareness technique called breath counting.³⁰ This doesn't change or influence your breathing pattern at all, but simply brings awareness to your breathing. Sit comfortably with your eyes closed, empty your mind and count each exhale. First exhale, count "one"; second exhale, count "two", etc. until you reach five. Then start with one again. Do not let your mind wander to anything except your breathing; if you do, you will find yourself counting past five! Try this for 10 minutes.

Further awareness of breath involves sitting quietly with your eyes closed and being aware of your breathing in and out, without forcing yourself to get too much or too little oxygen.³¹ Pay attention to your exhale. Many people tend to use effort to inhale, but not to exhale.³¹ At the end of a normal breath, try squeezing as much air out of your lungs as possible.³¹ You will use the intercostals muscles to do this, squeezing the ribcage inwards.³¹

Breathing through your nose is considered important because it limits the amount of air you can intake, so you are less likely to take in too much oxygen.³² Also, the hairs that line the nostrils help clean the air, and the nose helps to warm the air before it enters the lungs.³² Closing your eyes when you practice controlled breathing tends to make you feel less anxious and improves concentration.⁸

3. Bellows Breathing (The Stimulating Breath)⁵

Bellows breathing is a yogic technique that can be used to stimulate energy when needed⁵, but it is not a good idea if you have not had a recent physical exam to rule out the possibility of any of the health problems that can be triggered by hyperventilation. This exercise is done to intentionally stimulate the sympathetic nervous system any time you feel the need for a cup of coffee.⁵ Do not overuse this exercise, do not do it for more than 15 seconds, and make sure you are sitting in a supported position in case you get dizzy from hyperventilating. Sit upright and take very short breaths in and out through your nose (mouth closed). The breath in and the breath out are of equal length. The rate of breathing is as rapid as 2-3 cycles in/out per second, like a dog panting quickly.⁵ With this exercise, you use some chest breathing just as you would if you were under stress.⁵

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This article and all of our articles are intended for your information and education. We are not experts in the diagnosis and treatment of specific medical or mental problems. When dealing with a severe problem, please consult your healthcare or mental health professional and research the alternatives available for your particular diagnosis prior to embarking on a treatment plan. You are ultimately responsible for your health and treatment!

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RESOURCES:

Dr. Weil's Mindbody Tool Kit. With Dr. Andrew Weil (breathwork), Jon Kabat-Zinn (meditation), Martin Rossman (guided imagery), and Kimba Arem (sound therapy). ISBN: 1591794102. Audio CD and booklet. Sounds True, Boulder, CO, January 30, 2006. www.soundstrue.com Available from many retailers including Drugstore.com and Amazon.com. (approx. \$15).

Breathing: The Master Key to Self Healing by Andrew Weil, MD ISBN: 1564557 26X. Audio CD. Also available as tape or audio download. Sounds True, Boulder, CO, Feb 8, 2000. www.soundstrue.com Available from many retailers including Drugstore.com and Amazon.com. (approx. \$15).

Meditation for Optimum Health: How to Use Mindfulness and Breathing to Heal Your Body and Refresh Your Mind. By Andrew Weil, MD and Jon Kabat-Zinn ISBN: 1564558827. Audio CD. Sounds True, Boulder, CO, March 25, 1997. www.soundstrue.com Available from many retailers including Drugstore.com and Amazon.com. (approx. \$15).

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