

Optimize Breathing—Pandemic Era and Beyond

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The current deadly wave of coronavirus has left us gasping and worried. Hospitals in many countries are operating under dreadful conditions, barely coping with the sheer influx of COVID cases. With a scarcity of necessary equipment and supplies, particularly supplemental oxygen, it is imperative to focus on ancillary solutions. Integrating efficient breathing practices with conventional medicine is critical in reducing the burden and keeping people healthy.

This article will analyze this dire situation from a variety of angles. We will discuss problems such as poor breathing habits and comorbidities, which increase the likelihood of complications from COVID. In addition, we suggest proper breathing techniques practiced through the ages by our sages and validated by modern medical science. We will outline the advantages of slow-nose-belly breathing and describe specific and *breathtaking methods*, along with their respective benefits. Finally, we will address comorbidities that can exacerbate breathing problems.

Dysfunctional Breathing Habits

Although breathing is an essential biological function of an inherently automatic nature, most people do not comprehend the full benefits of proper breathing. COVID-19 has acted as a magnifying glass highlighting pervasive sub-optimal breathing habits that erode our health day-in and day-out. The pandemic has exacerbated tremendous differences in health outcomes tied to faulty breathing habits such as:

- Shallow, irregular breathing, predominantly using upper chest and neck muscles
- Mouth breathing and over-breathing (hyperventilation) of more than 20 breaths per minute. This poor technique can (a) increase stress (b) impair blood flow to the cells, tissues, and brain (c) deplete carbon dioxide. CO₂ is not entirely a waste gas. It is a catalyst for oxygen-carrying hemoglobin to release O₂ molecules to tissues
- Inhalations that are unnecessarily forceful and heavy

Proper Breathing Methods— Better Health with Each Breath

Research indicates that making adjustments to the way we inhale and exhale can rejuvenate internal organs while alleviating medical conditions such as asthma, snoring, and obstructive sleep dyspnea. These comorbidities worsen the clinical picture of COVID.

Proper breathing practice reduces stress, anxiety, and depression while improving mental, physical, emotional, and spiritual states. Proper breathing starts with gentle inhalation through the nose as the diaphragm contracts and the belly expands for air to flow into the lungs. This improves lung sac capacity.

Nose breathing provides a myriad of key benefits, including:

- Filters, warms, and humidifies the air, protecting the lungs in cold or dry environments
- Defends against viruses and other microorganisms
- Improves lung capacity and helps the diaphragm to work properly
- Increases oxygen uptake and circulation
- Slow nasal breathing increases the amount of oxygen entering the bloodstream by about 15%
- Stimulates the release of nitric oxide and endorphins

Descriptions and Benefits of Breathing Techniques

1. 4-7-8 Breathing for Relaxation and Optimal Health

When you are sad, stressed, or scared, you can sit, stand, or lie down to inflate and deflate the abdomen like a balloon. This breathing practice activates the parasympathetic nervous system while reducing anxiety and anger responses.

*Inhale for 4 seconds thru the nose. Hold for 7 seconds. Exhale for 8 seconds by breathing out *as if breathing through a thin straw*. Prolong the exhale, letting out air with a “whoosh” sound. Repeat for a few minutes to allow a buildup of carbon dioxide, which calms the nervous system. Breath-holding helps to increase lung capacity. If you feel agitated or stressed, lengthen your exhales.

2. Alternate Nostril Breathing

Alternate nostril breathing is a diaphragmatic breathing practice called *Anulom Vilom* (*Anu* means with, *Loma* means the grain or natural). This technique helps cleanse your breathing channels, referred to as *Nadi Shuddhi* (*Nadi* means pathway of energy, *Shuddhi* means purification).

*Close the right nostril with your right thumb and inhale deeply through the left. At the peak of the inhalation, close off the left nostril with the ring finger and retain the breath. Then exhale through the right nostril. Keeping the left nostril closed, inhale deeply through the right. At the peak of the inhalation, close off the right nostril with your right thumb and retain the breath. Then exhale through the left nostril. Breathing in and out should be done gently

without any force. To experience more relaxing and calming, you can follow the ratio of inhalation (4 counts), retention (7 counts), and exhalation (8 counts).

Benefits of Anulom Vilom include:

- Relaxes the mind and body, creating mental and emotional harmony
- Enhances respiratory functions and bolsters endurance
- Activates the parasympathetic nervous system
- Balances the right and left brain hemispheres resulting in equanimity
- Increases nitric oxide and carbon dioxide

3. *Bhramari Pranayama / Humming Bee Breath*

Bhramri means bee. This technique involves making a high-pitched humming sound in the throat during inhalation followed by a low-pitched humming sound during exhalation. Throughout this entire process, the lips are closed, and the ears remain closed with the fingers. This gently vibrates the tongue and sinuses, increasing parasympathetic activity, which helps relieve stress, agitation, and anger. The acoustic vibrations calm your body and mind, especially before meditation or sleep.

4. *Ujjayi / Ocean/Victory Breathing*

The name implies conquering or being victorious over the mind, which assists in synchronizing your movements along with your breath.

*By gently contracting your throat while nose breathing, a slight hissing sound is made in the throat. The resulting “ocean” sound and vibrations help to soothe, energize, and relax your body, mind, and emotions. The vagal stimulation also helps to relieve stress, build stamina, and increase endurance.

5. *Resonance Breathing*

Slow, nasal diaphragmatic breathing at a rate of about 4 to 7 breaths per minute helps to lower stress by sending impulses to the brain to calm down and relax. This is the breathing rate that Buddhist monks and yogis naturally enter into while meditating (however, even at rest, most people breathe more than 15 times per minute).

Resonance breathing supports the innate ability of our body, nervous system, and emotions to restore themselves by balancing the complementary branches of our autonomic nervous system. It promotes a calming balance between the sympathetic (which moves us towards activity like *fight or flight*) and the parasympathetic (which moves towards *rest, repair, regenerate, and digest*). Increased tone of the vagus nerve helps lower blood pressure, anxiety, and depression. It also improves heart rate variability (HRV) and helps with physiological and emotional balance.

6. *Kapalbhati breathing or Skull Shining Breath (also called the breath of fire)*

This technique involves taking short explosive exhalations generated by powerful contractions of the lower belly. It thus helps push air out of the lungs and strengthens the diaphragm and abdominal muscles. The focus is on forceful exhalation with contraction of the abdomen, followed by passive inhalation and effortless abdomen release.

7. *Pursed Lips Breathing*

This breathing technique is designed to enhance your breathing by making your breaths slower and more intentional. A slower breathing rate helps to relieve shortness of breath (dyspnea).

*Breathe in, through the nose, as if you are smelling a rose for two seconds and then exhale as if you are blowing out a candle for four seconds through pursed lips.

8. *Breathing & Coughing Relieves Excess Chest Secretions in Prone position*

Prone positioning (face down on the abdomen) can be easily implemented. Lying prone can improve breathing comfort and get more oxygen into the body. The higher density of pulmonary vessels in the dorsal (back part) lung region improves ventilation and helps open up these partially deflated areas.

It also relieves pressure on the heart and the diaphragm, helping the forced cough to be more effective. It helps to remove mucus buildup in the lungs. Excess mucus can block the ability to breathe and increase infection vulnerability. Self-proning and alternating positioning in a semi-propped position with assistance improves breathlessness. Additionally, using pillows or rolled towels increases comfort and relieves pressure on the bones.

*In prone or child-pose (*balasana*) follow the “rule of threes” — Inhale normally, exhale completely, and then hold for three seconds. Repeat three times. Then cough forcibly three times. Repeat the entire process three times.

Comorbid Conditions

The severity of COVID infection and the likelihood of recovery appear to be linked to older age and pre-existing health problems and lifestyle issues such as hypertension, diabetes, and heart-lung diseases. COVID-19 targets the lungs and makes it difficult to ventilate. Serious cases can lead to pneumonia or acute respiratory distress syndrome. Therefore, it is essential to proactively manage respiratory illnesses such as a) chronic obstructive pulmonary disease (COPD) in which a blocked airway impairs breathing, b) asthma, c) pulmonary fibrosis (damaged or scarred lung tissues). Smokers are also at an increased risk because their lungs

are already weakened. By identifying dysfunctional breathing habits, we can systematically replace them with healthy breathing patterns mitigating some of these comorbidities.

Enhanced Breathing Affects Almost Every Aspect of Our Life

- Practice self-care and preventive measures with every breath. Conscious breathing is our anchor during meditation
- Inhale and exhale with mindful awareness—*mind-body connection*. Psycho-neuro-immunology (PNI) focuses on how our nervous system, hormones, and the immune system interact with one another. Our innate self-healing abilities modulate the immune system by regulating its natural inflammatory response and increasing natural killer cells
- Mind-body techniques (MBT), with diaphragmatic breathing, mindfulness, and yoga, reduce mental stress and inflammatory conditions
- Deep, slow, belly breathing through the nose facilitates the movement of lymph through the body, helping remove metabolic waste and toxins. It strengthens the immune response
- Breathing practices with relaxation aid removal of unnecessary thoughts, helping with meditation and inner peace
- *Breathe Light to Breathe Right*. Practicing slow, light, nose abdominal breathing *day in and day out* reduces breathing difficulties during sleep and minimizes snoring. It also decreases stress, anxiety, and agitation
- People with allergies and/or asthma can reduce the excess mucus buildup by using a saline nasal spray or *Jal Neti*
- Hot shower and chest percussion help to thin out the mucus, facilitating removal
- Incentive spirometry facilitates slow, sustained deep inhalations, supporting lung expansion
- Erect posture with relaxed shoulders enhances lung capacity and stimulates blood flow, providing more oxygen to tissues. Poor postures adopted while being hunched over a computer or sitting on a couch watching TV for prolonged periods lead to incorrect breathing
- As we get older, our lung capacity and cardiac output decline, primarily because the rib-cage loses elasticity
- Tightly laced clothing, belts, and corsets restrict breathing and compress abdominal organs, causing poor digestion, back muscle atrophy, and rib cage deformity

- Long-term exposure to polluted air increases the risk of infection. To improve respiratory health, stop smoking, and avoid indoor and outdoor air pollution. Air purifiers and wearing a mask will help, especially if you continue to breathe in and out through the nose
- Stretching exercises and walking are advisable. Regular exercise can help develop muscles that work more effectively to increase lung capacity and oxygenation, while stimulating blood flow and decreasing inflammation
- Improve respiratory health by addressing *lifestyle factors* such as proper diet, adequate sleep, healthy relationships, regular medical checkups, and immunizations

Conclusion

Although it is intuitive, many of us pay little attention to the way we breathe and if we are breathing correctly. Chronic stress, sedentary lifestyles, and an unhealthy diet lead to adverse respiratory conditions. Complementary holistic approaches are of paramount importance for optimum health and wellbeing. The breathing methods and behavioral strategies outlined should be introduced in our educational systems, societal institutions, occupational settings, and workplaces. Improving health and resilience of individuals will help reduce the burden on our healthcare system.

A Parting Word of Caution

- One should practice breathing techniques on an empty stomach. The correctness of the methods should be verified with a yoga expert since each person's body and health circumstances may vary.
- Go easy, go slow. Always *listen to your body* but be willing to go a little bit beyond your comfort zone. Strive to be “comfortably uncomfortable.”
- This article does not constitute or substitute for medical advice *but may complement conventional care*.
- Work with your healthcare team to develop a fitness plan that works for you, especially if you have shortness of breath while resting, an irregular heartbeat, chest pain, or related symptoms.

Throughout decades of study, Swami Jyotirmananda's teachings on yoga and *pranayama* as well as Swamiji's art of explaining complex thoughts practically and humorously have left an indelible impression on Dr. Shroff—and clarified his understanding of how health and well-being are enhanced when *pranayama* and breathing practices are integrated into healthcare settings.