

## Improving lungs' efficiency to fight covid-19

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### Abstract

The coronavirus, emerged in China. The infection is fit for individual to individual transmission. Till now, no medicine or vaccine is available to treat this disease. Prevention such as hand wash, maintain physical distance and cover mouth and nose with mask, to be accounted.

Coronavirus enters from Nose mainly and travel up to lungs, through the respiratory system and thereby affect this system. To prevent or for the treatment, we have to strengthen our respiratory system and immune system.

Lungs are the most important in this system, so we have to focus on strengthening of lungs and to enhance the lung capacity. And for all this we have to go back to the Indian tradition of Yoga and Deep breathing. Indian Yoga darshan is the best remedy for corona like viruses.

**Keywords:** coronavirus, lungs, immune system, respiratory system, yoga

### Introduction

The corona virus which is known as novel corona virus, Covid – 19, emerged in the city of Wuhan, China, in December, 2019. This virus is concealed virus with a positive sense, single stranded RNA genome with a nucleocapsid of helical order. The infection is fit for individual to individual transmission, spreading to at any rate. It is identified with the SARS and MERS corona viruses.

Risk factors for the infection incorporate close contact with somebody who has visited Wuhan, China; and different urban communities encountering this flare-up; close contact with anybody determined to have the infection; and interacting with emissions from a contaminated individual. Sign and symptoms: Therapeutic analysts gauge that the hatching period differs from 2 days to around 14 days. Side effects may start like this season's cold flu virus yet proceed to create fever, hack, and brevity of breath that is sufficiently serious to warrant hospitalization in numerous patients. Albeit from the get-go right now, analysts recommend that individuals who are tainted yet don't show side effects might be infectious. This permits the infection to spread all the more adequately from individual to individual and makes it progressively hard to detach contaminated patients.

Treatment: Until now, there is no antiviral medicine or vaccine to treat this disease. Indication alleviation and steady consideration are present treatment strategies. Nonetheless, early strong consideration complications associated with this virus infection which includes difficulty breathing (may require a breathing machine), high fever, pneumonia, severe cough, organ failure and death.

Prevention: Wash your hands often with soap and water at least 20 seconds. If soap and water are not available, use an alcohol-based hand sanitizer, avoid touching eyes, nose, and hands, avoid close contact with sick people, stay home when feel sick, cover cough or sneeze with a tissue, and then throw the tissue in the trash, clean and disinfect frequently

touched objects and surfaces, etc.

### Mechanism of Lungs

For the treatment of Corona virus, we have to understand the respiratory system, focusing on the lungs mechanism. The lungs are located in the chest area, in the rib cage, on either side of the heart. They are roughly conical in shape with a rounded point at their apex and a flatter base where they meet the diaphragm. They are a

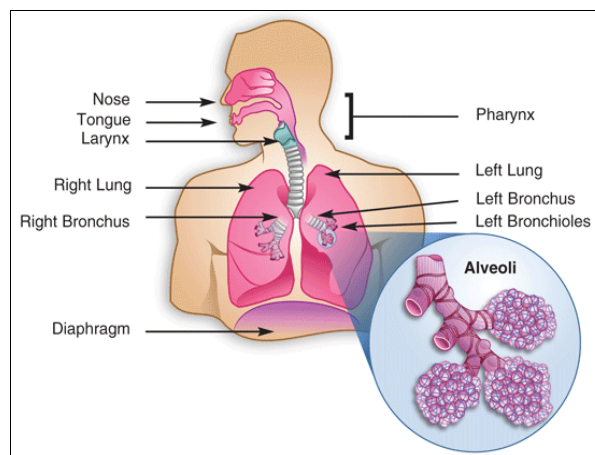


Fig 1

Pair, but not of same size. The right lung is shorter to allow space for the liver below. The lungs are surrounded by two membranes, known as the pulmonary pleurae. The inner layer directly lines the outer surface of the lungs and the outer layer is attached to the inner wall of the rib cage. The space between the two membranes is filled with pleural fluid.

The main function of the lungs is the process of gas exchange, called respiration. In respiration, oxygen from incoming air enters the blood, and carbon dioxide, a waste gas from the metabolism, leaves the blood.

When the air enters the nose or mouth, it travels down the trachea, also called the wind pipe. After this, it reaches a section called the Carina. At the carina, the wind pipe splits into two, creating two mainstream bronchi. One leads to the left lung and the other to the right lung. From there, the pipe-like bronchi splits into smaller bronchi and then even smaller bronchioles. This ever-decreasing pipe work eventually terminates in the alveoli, which are like air sacks endings.

Here gas exchange occurs.

**Surfactant in the Lungs**

Special cells in the alveoli produces a compound known as pulmonary surfactant. It is composed of lipids, proteins and carbohydrates. Surfactant has both hydrophilic & hydrophobic regions. Pulmonary surfactants serve a number of vital functions. These include:

Allowing better breathing efficiency.

Preventing the alveoli from collapsing on themselves.

Each alveoli is like a plastic bag that is wet inside. If there were no surfactant, the bag would collapse in on itself. Pulmonary surfactant carries out its role by reducing the amount of surface tension. By doing this, it reduces the effort necessary to inflate the alveoli.

### **Other functions of the lungs**

**pH balance:** Too much carbon dioxide can cause the body to become acidic. If the lungs detect a rise in acidity, they increase the rate of ventilation to expel more of the unwanted gas.

**Filtering:** The lungs filter small blood clots and they can remove small air bubbles, known as Embolisms.

**Protective:** The lungs can act as a shock absorber for the heart in certain types of collision.

**Protection from Infection:** certain membranes within the lungs secrete Immunoglobulin A. This protects the lungs from infections.

**Mucociliary Clearance:** The mucous that lines the respiratory passage traps dust particles and bacteria. Tiny hair like projections, known as cilia, moves these particles upward to a position where they can be coughed out or swallowed and destroyed by the digestive system.

**Blood Reservoir:** The lungs can vary how much blood they contain at any moment. This function can be useful during exercise. The amount of blood the lungs contain can vary from 500 to 1000 ml. The lungs interact with the heart and can help the heart function more efficiently.

Pranayama, means “to extend the vital life force”, or prana, is an incredibly rich practice made up from many breathing techniques. Patanjali in his Yoga Sutra, describes pranayama as a process by which you can break your unconscious breathing pattern and make the breath long, easeful, and smooth. These breathing patterns can activate the sympathetic nervous system. Corona virus affects our respiratory system. Our lungs are same as the hive of honey bees. The air sacks get packed by mucous, which formed by the carbon dioxide and water. This mucous form a sticky layer on these air sacks (alluvial) of lungs. Recovering lung function is possible but requires therapy and Yoga practices for months. On practicing Deep Breathing Pranayams, this cough / mucous got exit from there and this result in the opening and expansion of lungs.

### **Benefits of Breathing Exercises**

Deep breathing can help restore diaphragm function and

increase long capacity. The goal is to build up the ability to breathe deeply during any activity, not just while at rest.

Breathing exercises are an important part of managing some respiratory condition. The main aim of such exercises are to clear the lungs of sticky mucous, coordinate breathing with medication to deliver the optimum dose and to keep the airways open. Deep breathing enables the erythrocytes to pick up sufficient oxygen from the lungs and transports it to the body’s tissues. This is important because an adequate supply of oxygen is vital if the organs are to function properly.

In deep breathing, the diaphragm expands and as a result lungs got ample space, lung volume increases and now lungs have a capacity to have more air/oxygen. This increases the flow of blood in the body, which is a sign of better functioning of heart. Immune system gets a booster dose.

### **Several Simple Techniques**

#### **Suryabhedhi Pranayam**

Hatha Yoga Pradipika defines Suryabhedhi Pranayam or Right Nostril breathing as one of the most beneficial techniques of yoga. Prime focus of this pranayama is to activate the Sun element in the body. The Sun piercing technique involves right nostril or ‘pingla’ which depicts the vitality of the Sun. Suryabhedhi pranayama is a relaxing technique. Body should remain calm. This is a silent viloma pranayama. Make yourself comfortable in Siddhasana or Padmasana, with eyes closed and spine, neck and back must be straight. Close left nostril with Ring finger and little finger. Inhale slowly and deeply through right nostril. After inhalation, close the right nostril with the thumb. Now exhale through left nostril, keeping right nostril closed. It is one complete cycle of Surya bhedi Pranayama. Repeat it for 10 times. It increases the flow of gall and reduces phlegm and gas in the body, improves blood circulation and purification, improves digestion. It cures the insufficiency of oxygen in the blood. It also cleans the frontal sinuses and destroys intestinal worms, keeps body warm. Also, it generates lots of energy by enhancing metabolism. It is good for cold, cough and asthma recovery.

#### **Bhastrika Pranayama**

In any physical activity our body needs more oxygen, which signals the heart to pump faster, thus raising the heartbeat. In Bhastrika pranayama, we pump more quantity of oxygen even without the body not asking for it. It is the process of rapid inhalation and exhalation, which gives a boost to the body. So when feeling that body needs energy, try Bhastrika Pranayama.

Sit in a Vajrasana, to make spine erect and better diaphragmatic movement. Make a fist and fold arms, placing them near the shoulders. Inhale deeply, raise your hands up and open the fists. Exhale slightly forcefully, bring arms down next to shoulders and close the fists. Continue for 20 breaths. Relax with palms on thighs. Continue for 2 more rounds.

#### **Extended Exhalation**

Pranayama techniques that foster a long, smooth exhale are more beneficial. They can support the parasympathetic nervous system and activate the “relaxation response”, reducing stress and its effects on body and mind.

The 1; 2 breathing practice, involves gradually increasing

exhalation until it is twice the length of inhalation, relaxes the nervous system. It can reduce insomnia, sleep disturbances and anxiety.

Start with lying on back with knees bent and feet flat on the floor, hip-width apart. Place a palm on the abdomen and take a few relaxed breaths, feeling the abdomen expand on the inhalation and gently contract on the exhalation. Count the length of each inhalation and exhalation. If the inhalation is longer than the exhalation, make them same in next few breaths.

Now gradually increase the length of exhalation by 1 to 2 seconds by gently contracting the abdomen. Continue to gradually increase the exhalation by 1 to 2 seconds once every few breathe, till the breaths feels smooth and relaxed. Make sure for no strain. All here we conclude that, we have to improve our respiratory system and Yoga is the best, easy of all options.

### Shankh Mudra Breathing

Here is one more and even the most powerful, much extended exhalation technique with unique acupressure activity practice.

Breathing in a proper manner is very important, as we know breathing is the only source to intake oxygen (air) from which our lungs and whole bodily systems work properly, including our life line – blood. Oxygen is much important for us. Oxygen fuels our cells and helps provide the basic building blocks that our bodies need to survive. Oxygen is also necessary for constructing replacement cells for our bodies. Oxygen is also a particularly important part of our immune system. It is used to help kill bacteria, and it fuel the cells that make up our body's defenses against viruses and other invaders.

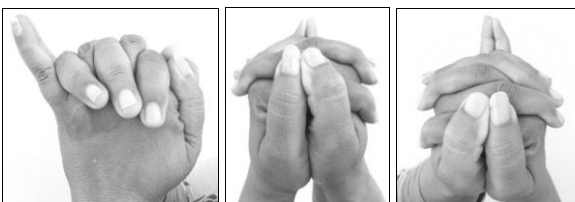


Fig 2

Every human being has his own breathing pattern, which has its impact on his personality and vice – versa. But the actual, right way of breathing is somewhat different and we have to practice that ideal, standard pattern for some hours, every day, to maintain good health.

For this practice, if we have an object or an instrument, we can perform better. That's why we were in search of some instrument and tried to resemble Shankh (Conch, Sea Shell) by hand formation (Mudra) and by blowing this, we get better results. Anywhere, anytime, we can make this Mudra & start blowing, which gives us the results of deep breathing and acupressure both.

“Shankh has an important place, in Hindu rituals & to blow it, is to deliver a message, to start the prayers. In most of the Hindu rituals & in war, Shankh was blown, as an informative start or warning bell to the enemies, and many more. So, it is the best, easily available gift of Nature. My thought process guides me to make the hand formation (Mudra) as of this Shankh and blow it to its fullest, to get all the benefits of the natural Shankh, in deep breathing with acupressure. The entry gates of the respiratory system are

the mouth and nose. This is where air comes into the human body, and this air is then directed toward and down the trachea into the lungs. The diaphragm is the dome shaped muscle located across the bottom of the chest, separating the chest area from the abdominal area. Diaphragm makes the body draw in air through the nose and mouth and then exhale air through the same orifices. Diaphragm is the main muscle used for breathing. It tightens on inhalation, allowing lungs to expand into the space in chest. Intercostals muscles, located near the lungs, helps to create space in chest by contracting to pull ribcage upward and outward during inhalation. The airways transport oxygen rich air into lungs and carbon dioxide out of lungs. Effective use of the respiratory system ensures that we are breathing well and to our maximum capacity.

As air enters the nose and mouth, it is cleansed from impurities such as dust. Tiny hairs in the nose known as cilia, act almost like a brush to catch dust particles and other such things before the air can get into the lungs. Anything that gets past the cilia is trapped in the mucus that lines the trachea and the bronchial tubes that takes air from the trachea into the lungs. The human body is well equipped to trap these particles, but the body works best when air is relatively pure before it is inhaled.

The human circulatory system takes the oxygen throughout the body and brings carbon dioxide back to the lungs. The entire process is repeated with every breath that human beings take.

One of the very easiest and multi beneficial hand formation will be Shankh Mudra for Deep breathing. Specially for the betterment of Lung's functioning. Actually, this hand formation – Mudra, we are creating pressure on many reflex points in hand. Also, we are performing deep breathing, through which Oxygen is stored in our lungs and body and when we exhale the Carbon dioxide by mouth in a slow and long form, it will create pressure on nervous system and facial muscles. All these combinedly creates many wonders, which neither the Mudra will do, nor the deep breathing exercises can separately.

To form this Mudra

- Join the palms and then open them like lotus flower.
- Now, try to interlock (cross) the first three fingers (index, middle and ring) and create a hollow space in the joined palm.
- Join the little fingers by touching their faces.
- Put both the thumbs, as near as possible, on the index fingers, making a little passage or gap (for air blowing), in between the thumbs.
- Make sure that your hands are closer to your chest level.
- Check the formation. It should resemble Shankh (Sea Shell conch).

This is the perfect Shankh mudra with a lot of benefits. As of a Shankh, here is a ‘mouth’ end, gap in our thumb and a ‘flair’ end, our little fingers, like most wind instruments. We blow air into the cavity at the mouth end.

### To Blow

- Place your lips on the gap between the thumbs. Adjust the shape of palms, so that the air may get space to amplify.
- Take a deep breath with your nose, filling up your lungs.

- Hold it for a second, to prevent yourself from getting dizzy or light-headed, when you blow out.
- Blow out forcefully through lips, causing them to vibrate. Use your stomach muscles to blow the air out of your lungs through mouth, keeping lips close together.
- Vibrating lips cause the noise like horn. If you are doing it perfectly, it should feel like your lips are buzzing. Remember to keep taking deep long breaths each time.

**Stimulates the Lymphatic System:** During the exhale in Shankh Mudra, you may feel that breath out is somewhat longer than the inhale. This results the release of more carbon mono oxide (toxins). The more oxygen in the blood, the better the functions of our body. It improves our stamina.

**Lowers Blood Pressure:** When muscles relaxed, blood vessels dilate and this improves blood circulation and lowers the Blood Pressure. Shankh Mudra also slows down and regulates the Heart Beats, Which also helps in lowering Blood Pressure.

In Shankh Mudra breathing, as our body is in stretched fully, our organs gets full space to expand and contract. As during deep breathing, our lungs takes maximum space, diaphragm pulls down, which turn our torso straightens in order for this to be possible. In generalized way, we may feel improvements in our brain (thought process), spinal cord, nervous system, respiratory system, digestion system, our body posture and many more.

When we do Shankh Mudra breathing with controlled breath out, the primordial sound of "OM" emanates from it. This external sound is the origin of all Vedas. It represents the creation and the truth behind this.

As this blowing resembles the Shankh blowing, it also enhances the positive psychological vibrations such as courage, determination, hope, optimism, will power and bliss can be felt by all people assembled there and by the blower.

As and when we get the perfection in this Shankh Mudra, the frequencies of divine energy are emitted into atmosphere due to sound generated by this Mudra. This increases the proportion of energy, ananda and chaitanya in the environment and that's why the negative energies get distressed and runaway.

Another Speciality of the blowing sound of Shankh Mudra is that the vibrations emanating destroys the disease causing germs in the atmosphere. And makes the atmosphere holy, pure & conductive for the spiritual growth of the individuals.

The well-known scientist J. C. Bose has proved that the harmful invisible virus, insects are disappeared by the sound produced by the Shankh shell and the same is with our Shankh Mudra's sound.

Also, the moment we start controlled forceful exhale, our brain emptied of all thoughts. Invariably we will enter state of Tran's, where we are very receptive. This Tran's state is the one with awareness. Blockages in heart will go away and respiratory system gets benefits, by regularly do this Shankh Mudra Breathing.

The pressure in both the hands and in spine and brain, stimulate the body's circulatory, lymphatic and hormonal systems. It also helps the functions of the immune system natural ability to heal itself.

Deep breathing through Shankh Mudra is the unique, easiest, convenient and natural 'Mudra' to combat stress and anxiety, to reduce High Blood Pressure and an aid in digestion. Deep breathing through Shankh Mudra strengthens our respiratory organs, such as lungs, diaphragm, etc in a mark able way. It activates the Thymus gland which helps immune system.

During Shankh Mudra, we take deep and long breath and try to fill more oxygen in our body, so that the resultant exhalation, will create a long passage for the carbon dioxide to come out from the very corners of mind and body cells, in the form of sound be long enough, will do all these wonders. In Shankh Mudra, exhalation is long, forceful & in steps, which provides a chance to the toxins to come out of the body. This detoxifies our body and mind. Reduces tensions and relieves stress. Deep breathing in itself is one of the best ways to lower stress in the body and mind. This is because when we breathe slowly and deeply, a message is conveyed to brain to calm down & relaxed. The brain sends this message to the body and finally the body comes in relaxed mode. 'Mudra', hand formation, has also its own benefits. This is wonderful. A state of Trans. Here the pressure points in hand activates, which gets multiple benefits because of the state, in which more and more carbon dioxide is travelling out. The emptied cell gets violent stimulation and purified blood in nerves boosts up the cleansing or detoxification processes.

### Organ Clock

According to Ayurveda, our body is completely aligned with the times of the day, in regard to our vital organs. Every hour is related to a specific organ(s), and the organ will be at its most powerful energy at its respective times. The time each organ is spiking can reveal to us the best time for treatment, as well as the most likely time an imbalance may occur. This internal body clock or organ clock can help us align our daily activities in order to allow optimal functioning and therefore optimal health. Each of these have a two hour period where the primary meridian is linked to particular parts of the body, thoughts, emotions and other spiritual aspects. They are also partnered together as receiving and expressing energy of an element – Earth, Air, Water, Fire and Space. The 24 hour cycle of Organ, generally starts at 5 AM, which is the time for LUNGS, the foremost organ. Ayurvedic physicians, siddhas, rishis, naturopaths at earlier times used to wake up before 5AM, which is defined as "Brahma Muhurat". Probably, this time is good for breathing exercises, so that lung will gain more energy from universe. The lungs are the first organ of the day that is up for repair and maintenance. Lungs begin loosening the poisoning waste between 3 to 5 AM, and when we awake, this is why we cough sometimes. The energy enters the lung channel at 3 AM. Our lungs are trying to expel the loosened waste. If we are coughing in the morning, this indicates that our diet and lifestyle needs tweaking.



Fig 5

So, we have to eat a balanced wholesome diet to support our organs, providing fuel for replenishment and to increase the vital life force. Incorporate exercise such as walking, running and yoga into the lifestyle. Immerse our self into the nature where we can feel the natural rhythms of the earth. Being in nature balances the natural rhythms of our body and is healing.

**Conclusion**

Deep breathing is the easiest, convenient and natural tool to fulfill the body with extra oxygen, especially in lungs, which do all the wonders. Highly oxygenated blood promotes the organs to function more effectively, including intestines, which digest the food.

When blood is highly oxygenated, it carries and absorbs nutrients and vitamins more efficiently. The cleaner the blood, the harder it is for illness to come.

Breathing has the power to cleanse 70% of the body toxins (30% is through bladder and bowels). If we do not breath fully, our body must work overtime to release these toxins.

In deep breathing, our lungs take up maximum space to expand, diaphragm pulls down, which turns our torso straightens in order for this to be possible. As a result of this expansion, lung volume increases and now lungs have a capacity for more oxygen. Immune system gets a booster dose.

As we practice daily the above mentioned Pranayama and Yoga practices, with managing our breath in & out, we can boost our immunity & can improve lung efficiency and respiratory system.

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