

NORMAL BREATHING, COPD & YOGA PRACTICE

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Normal Breathing

Each lung is between 10 and 12 inches long. The two lungs are separated by heart, esophagus, and blood vessels. The lungs are covered by a protective membrane called the pulmonary pleura.

Lung function normally peaks in the late teens and early twenties. After the early twenties, lung function declines about 1 percent a year over the rest of a person's lifetime. Lung function decreases about 2 percent a year for people who smoke.

In order to understand breathing impairment more fully let us first review the process of healthy lung breathing.

Inhalation: Air enters through the nose into the windpipe (trachea), flowing through the large airways (bronchial tubes) and then down the small airways (bronchioles) into the air sacs (alveoli) attached to the small airways. Diaphragm, the primary breathing muscle contracts to expand the chest, creates negative air pressure and thus draws air into the lungs.¹ Oxygen (O₂) from the air passes through the air sacs into the blood vessels and the blood then carries the oxygen to all parts of the body.

Air flows in without obstruction or restriction in the healthy lungs because of the following: 1) airways are unblocked and undamaged 2) air sacs are elastic, that is, expand and come back to original position 3) the diaphragm muscle is strong and flexible, that is, can contract effectively and 4) the ribcage and chest muscles are strong and flexible to expand and elevate to allow room for the lungs to expand.

Exhalation: Diaphragm relaxes and the chest contracts to force waste air out of the lungs. Waste air including carbon dioxide (CO₂) is carried by the blood vessels back to the air sacs and expelled through the airways and out through the nose. Air flows out unobstructed because of the following: 1) the diaphragm is flexible enough to relax 2) chest and ribcage muscles are strong and flexible to release and restore to the original position 3) Air sacs are able to return to normal, that is their pre-inhalation size to expel the air and 4) airways are elastic and open and do not collapse during exhalation.

Pulmonary Diffusion (exchange of gases in the lungs)

Pulmonary circulation is the movement of blood from the heart, to the lungs, and back to the heart again..

The veins bring waste-rich blood back to the heart, entering the right atrium throughout two large veins called vena cavae. The right atrium fills with the waste-rich blood and then contracts, pushing the blood through a one-way valve into the right ventricle. The right ventricle fills and then contracts, pushing the blood into the pulmonary artery which leads to the lungs. In the lung capillaries, the exchange of carbon dioxide and oxygen takes place. The fresh, oxygen-rich blood enters the pulmonary veins and then returns to the heart, re-entering through the left atrium. The oxygen-rich blood then passes through a one-way valve into the left ventricle where it will exit the heart through the main artery, called the aorta. The left ventricle's contraction forces the blood into the aorta and the blood begins its journey throughout the body.

The average adult's lungs contain about 600 million of spongy air sacs surrounded by capillaries.. The inhaled oxygen passes into the alveoli. Diffuses through the capillaries into the arterial blood. Meanwhile, the waste-rich blood from the veins releases CO₂ into the alveoli and exhaled

What is Chronic Obstructive Pulmonary Disease (COPD):

Lung impairment can be divided into two categories:

1. Restrictive—when patients have difficulty in getting the air IN because the lung or the chest is stiff and hard to move
2. Obstructive—when the airways are narrowed and patients have difficulty in getting the air in and out, but mainly getting the air OUT.

Examples of restrictive disease: Pulmonary fibrosis, lung cancer or pneumonia.

Examples of obstructive disease: Chronic bronchitis, chronic obstructive bronchitis, emphysema and asthma.

Note: Progressively deteriorating asthma observed in some adults is sometimes a combination of restrictive and obstructive disease

In 2001 estimated 35 million suffered from diagnosed or undiagnosed Chronic Obstructive Pulmonary Disease (COPD).ⁱⁱ COPD is currently the fourth leading cause of “chronic morbidity and mortality”

Chronic lung disease can grow insidiously for years with or without the overt symptoms such as the chronic cough, excessive mucus, breathlessness or noticeable functional impairment. We tend to blame shortness of breath on age, weight, heart, hypertension or some unknown medical reason. Lung disorder as a possible cause is hardly suspected until the impairment has taken a significant toll. By the time a person is diagnosed with COPD, often 50% of the lung function is already destroyed. Perhaps someone you love and care about or you yourself may already be affected in some way by asthma, COPD or another other respiratory disorder. If you experience breathlessness or decreased exercise capacity, ask your doctor for spirometry (measurement of breathing capacity) to know how your breathing capacity compares with other people of your age

Chronic Bronchitis

In chronic bronchitis, airways remain chronically inflamed and swollen producing large amount of mucus which can make breathing difficult. The insides of the swollen airways become narrow or closed in. Mucus may remain trapped in the swollen and narrowed airways. Prolonged exposure to tobacco smoke and/or other noxious chemicals and gases can irritate the airways and cause them to secrete extra mucus. The "smoker's cough" of current or past smokers may be a symptom of chronic bronchitis. The warning signal of “morning smokers cough” even a mild one, should never be ignored.

Chronic bronchitis should not be confused with *acute bronchitis*, which is often caused by chest cold or respiratory infection that normally lasts only for a week or two. Chronic bronchitis, on the other hand is defined as the “presence of cough and sputum

production for at least 3 months in each of 2 consecutive years,” and is not necessarily associated with airflow limitation.ⁱⁱⁱ

When chronic bronchitis is associated with airflow limitation, it is called *chronic obstructive bronchitis*.

Emphysema

The word, “emphysema” is derived from a Greek word which means “inflation.” In emphysema lungs are inflated or enlarged because the patient is only partially able to get the air out of the lungs. The air sacs like the tiny balloons are “blown” with old and stale air trapped inside them. This makes it harder for fresh air to get in and the stale air much harder to go out. Air sacs and small airways (bronchioles) are impaired and lose their elasticity. As a result, air sacs are never able to return to their normal size. The blood vessels around air sacs are also diminished and impaired which reduces the amount of oxygen from reaching the blood stream and carbon dioxide from getting out of the body.

COPD

Previous definitions of COPD included the terms “chronic bronchitis” and “emphysema,” but the GOLD panel of experts say that these terms are not interchangeable with the term “COPD” for the following reasons:

1. Emphysema describes only one of several structural abnormalities present in a person with COPD
2. Chronic bronchitis does not reflect the major impact of airflow limitation on morbidity and mortality in COPD patients.
3. GOLD document further states that chronic cough and sputum, chief characteristics of chronic COPD, do not always precede the development of airflow limitation; some patients develop significant airflow limitation without chronic cough and sputum production.” (GOLD 2006, p.3)

In summary, “COPD” is the term we all should use because it is a more accurate description of the impairment in the lungs and its impact on the rest of the body. The term COPD is inclusive of emphysema and chronic bronchitis.

“Is It Asthma or COPD?”

If there is no overlapping between asthma and COPD pathology, that is, the “purest form,” we can differentiate asthma and COPD as follows:

1. Airflow limitation is reversible in asthma but irreversible or only partially reversible in COPD.
2. Asthma is characterized by episodes or attacks of allergic asthmatic reactive inflammation and narrowing of small airways. Many elements can trigger asthma attacks such as allergens (e.g., pollen), infections, exercise, changes in the

weather, and exposure to airway irritants (e.g., tobacco smoke). Asthma attacks can range from mild to a life threatening episode.

COPD is *characterized by chronic airflow limitation that is not fully reversible.*”

Chronic airflow limitation is caused by chronic inflammation of the lungs which results into the following:

1. “Airway disease,” which refers to the structural changes and the narrowing of the small airways, also called, “obstructive bronchiolitis.” (Bronchioles=small airways).
2. “Parenchymal destruction. The term “parenchyma” refers to “tissue mass” hence, the “destruction of the lung mass.” Parenchymal destruction translates into two major problems: a) loss of alveolar attachments. Air sacs are attached to small airways, which are called “alveolar attachments.” Loss of alveolar attachments results into significant loss of support for the small airways; b) “decrease of elastic recoil” of the lung, and therefore further difficulty in getting stale air out of the lungs. In order to appreciate this change, picture the air sacs as tiny balloons or rubber bands. Balloon inflates when the air is filled and it deflates when the air is released. Likewise, rubber band stretches when pulled and snaps back when released. When the air sacs lose their elastic recoil means that after taking the air in and inflating, they don’t “snap back” to their normal size.

“The airflow limitation is usually progressive”

Airflow limitation is usually progressive but that progress can be slowed down by optimal utilization of treatment, exercise, nutrition and self-care and avoiding all tobacco smoke and other noxious agents. Many people with COPD have an asthmatic component as well. This problem may be helped by bronchial dilator medications. Airflow limitation caused by asthma related inflammation is reversible. Reversal of the reversible airflow limitation should be a target of every individual afflicted with breathing impairment.

People with COPD, often express their breathing discomfort in such terms as “I have to try so hard to breathe;” “can’t catch my breath” “I feel I am hungry for air,” or “gasping for breath”

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- The airways and air sacs lose their elastic quality.
- The walls between many of the air sacs are destroyed.
- The walls of the airways become thick and inflamed.

- The airways make more mucus than usual, which tends to clog them

The "airways" are the tubes that carry air in and out of the lungs through the nose and mouth. Healthy airways and air sacs in the lungs are elastic—they try to bounce back to their original shape after being stretched or filled with air, just the way a new rubber band or balloon does. This elastic quality helps retain the normal structure of the lung and helps to move the air quickly in and out.

In people with COPD, the air sacs no longer bounce back to their original shape. The airways can also become swollen or thicker than normal, and mucus production might increase. The floppy airways are blocked, or obstructed, making it even harder to get air out of the lungs:

Caution:

1. What is helpful for obstructive breathing in some cases can be harmful for restrictive breathing. Therefore, don't ask people with pulmonary fibrosis (restrictive disease) right away to "Breathe slowly!" They have to take short and rapid breaths for their oxygen-starved body because that is the most mechanically efficient way to breathe with this condition. After learning relaxation and more effective breathing over time, they may be able to take fewer breaths per minute.
2. Don't ask people with COPD right away to "Take a deep breath" because they might not be able to get rid off of the excess air and with a few long and/or deep breaths may experience breathing discomfort. In most cases people with COPD and chronic asthma can benefit by slowing the breathing and lengthening exhalation.

Designing Yoga Practice for People with COPD (obstructive breathing)

Abstract: Overall goal, objectives, strategies, adaptation guidelines for a “breath friendly” asanas (yoga postures) strength and flexibility and breathing techniques for slowing the breathing and lengthening the exhalation are provided so yoga teachers and therapists can design appropriate practices for their students.

Introduction

Medical science has just begun to recognize that COPD is not just a disease of the lungs, it is a systemic ("body wide") problem. Airway disease and the destruction of the lungs mass (i.e. parenchyma) significantly reduce the ability of the airways to remain open during exhalation. It can be beneficial to develop a **breathing pattern of slower and longer exhalation** to empty the lungs more efficiently according to your capacity.

Because the airflow limitation is slowly progressive, people with COPD, health professionals and self-care specialists should make optimal use of the treatment, rehabilitation program, exercise, breathing training, meditation, relaxation, nutrition, support groups and self-management to **slow down the “progress” of the disease and reverse the reversible airflow limitation**

Yoga is a holistic system that engages the mind, body and breath. When adapted to the specific needs of a person with COPD and practiced safely, it can provide a more comprehensive physical and mental self-care system than a narrowly defined care set of exercises and/or breathing techniques. A mind-body system is ideal for a mind-body condition!

If breathing impairment was diagnosed earlier and benefits of yoga fully exploited, physical and emotional and extra-pulmonary effects could be attenuated and slowed down.

Goal

Increase whole body endurance and strength and improve breathing efficiency

Objectives

- Reduce shortness of breath and breathing discomfort
- Minimize the use of neck and shoulder muscles during breathing
- More efficient filling and emptying of lungs
- Increase breath awareness and breath control
- Increase chest and abdominal excursion (mid-section of special interest for diaphragmatic flexibility and movement)

- Increase strength and flexibility of the intercostals (lower ribs of special interest for side rib breathing)
- Increase strength and flexibility of the inspiratory and expiratory muscles (forced expiration of especial interest)
- Increase strength and flexibility of the back muscles
- Increase strength and flexibility of the upper and lower extremities
- Improve posture and balance

Strategies/Techniques

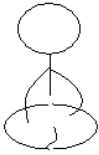
- Prefer gentle and slower yoga
- Prior to performing a practice session, stabilize breathing and facilitate the action of breathing muscles with conscious breathing and relaxed attention
- Promote breath awareness by utilizing such techniques as “counted breaths” “counting the breath duration” and “tracking the movement of breath in the body.”
- By utilizing the above breathing awareness techniques, help the individual to slow the breathing and lengthen the exhalation. Work on achieving exhalation at least equal or longer than inhalation.
- Prefer fewer repetitions and longer stay in the poses to keep the blood flow for a longer period in the targeted areas.
- As far as possible, move the spine in five directions (forward bending, backward bending, inter-vertebral extension, lateral flexion and twist) in each session
- Coordinate the spinal directional movements with inhalation and exhalation to optimize the effects for spinal flexibility and strength and breathing efficiency.
- Progressively slow the duration of specific movements in the yoga poses to increase endurance for the exercised body parts
- Progressively increase the length of exhalation and inhalation in small increments to coordinate with the slowing of the movements in the yoga poses

Adaptation Guidelines for a “breath friendly” practice

- Pause and rest as needed. Some individuals with respiratory challenges need more rest pauses.
- Prompt de-tensing: Relax any excessive or uncalled for tension during and after the completion of the pose.
- Modify intensity and pacing: Scale down the intensity of the exercise and pace as needed. If shortness of breath (SOB) is experienced, utilize Pursed Lip Breathing (PLB) or pause to stabilize the breath
- Modify rules of inhalation during movement: Traditional rules of breath and movement coordination may be modified to suit the student’s need. For example, a backbend may be during exhalation instead of inhalation. If needed, what is done on inhale can be done on exhale. Instruct the individual to exhale while moving into and out of the pose and inhale during the stationary position.

However, when possible, backward bending should be performed during inhalation to strengthen the inspiratory muscles.

- Accommodate excessive neck and shoulder rigidity: For those with excessive tension and rigidity in the neck and/or excessive involvement of neck and shoulder muscles during breathing or those who experience SOB or pain in raising the arms above shoulder level or neck turning, modify an asana to keep

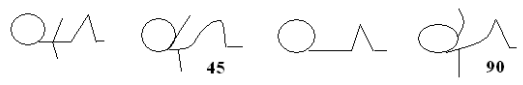

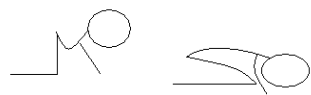
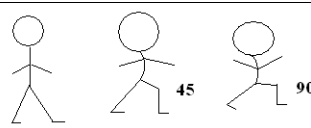
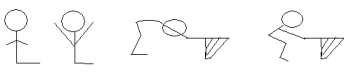
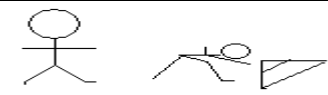
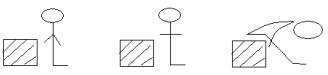

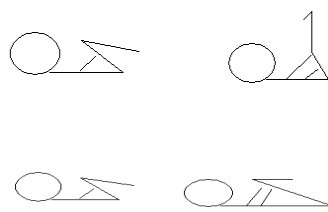
1.)	(Supine supported or seated) conscious breathing	6x	
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arms and hands at or below the shoulder level and avoid neck turning. For example, in the Triangle pose, ask the student to keep the hand behind the back and look at the floor or the front wall.

- Use of props and support: Props and supports should be considered in the interest of safety and effectiveness for the desired effect of an asana and/or more efficient breathing. Prefer props which minimize strain on the breathing, maximize blood flow into the targeted muscles and organs, and augment breathing. Avoid props that are effort-intensive, expensive or require assistance of another individual in order to utilize them.

Yoga for COPD Segment 2-week 3 &4 (“Mild” practice appropriate for some people with moderate to severe COPD) Designed by Gary Kraftsow* with a few modifications by the author

NOTE: Specific instructions are provided to coordinate the movement with exhalation or inhalation. However, if inhalation during a movement(s) challenges your breathing, do the movements while exhaling and inhale during the stationary position.

2.)	(Supine) arms movement (variation)	3-6x	
3.)	(Supine) bridge pose	3-6x	
4.)	(kneeling) cat-child pose (Optional: Uttanasna after Cat-child)	3-6x	
5.)	(standing) warrior I Poses (A & B)	3-6x each leg	
6.)	(standing) forward bend to chair Optional: Tree Pose	3-6x	
7.)	(standing) triangle with chair	3 x each leg	
8.)	(chair) forward bending	3-6 x	
9.)	(supine) bridge pose (same as #3)	3-6x	
10.)	(supine) knee to chest		

B. Breathing

* cited with permission of G. Kraftsow

Exercise # 1: Supine/seated conscious breathing (*description bottom of the page)

Exercises #2 Arms movement: pillow may be used under the neck to relax the neck and shoulders. If strenuous, arm raise may be done on exhale.

Exercises #3 Bridge Pose: If strenuous, both pelvic raising and lowering may be done on exhale. Only if you feel up to it, you may do other arm variations such as moving over the head or sliding arms up and down in the stay position

Exercises #4 Cat-Child Pose: Going all the way on the heels may be hard on the joints and for breathing. If so, keep a blanket or pillow on the ankle tendons.

Optional Standing Forward Bend (Uttansana): If desired, a student may do 1-6 repetitions of Uttansana with bent knees and sliding hands up and down the legs while moving in and out of the pose.

Exercises #5 Warrior Pose: Keep the hands at the abdominal level in order to keep the shoulders down. If suitable, other arms and hands variations such as pelvic level or mid-chest level may be utilized to augment the effects

Exercises #6 Forward Bend to Chair: Keep the chair against the wall for safety. Avoid arm raise for a student with neck and shoulder rigidity. If standing and sitting each time for forward bending is strenuous, bend with hands resting on the chair and perform dynamic Ardha Utkatasana-like movements)

Optional Supported Tree Pose: Stand near the wall/ chair and raise your foot at or below the knee for 1-4 breath. Then switch to the other leg for 1-4 breaths. If you feel unstable, rest your hand on the chair to steady yourself.

Exercises #7 Triangle with chair: Keep the chair against the wall for safety. Unlike the traditional Triangle, look down or at the front wall. Only if comfortable, turn up the neck towards the ceiling.

Exercises #8 Forward Bending from Chair: Entire set of forward bending may be performed while sitting in the chair. For a more challenging pose, you may stand and sit down every time to bend forward.

Exercises #9 Bridge Pose: If strenuous, pelvic raising and lowering both may be done on exhale. Only if you feel up to it, you may do other arm variations such as moving over the head or sliding arms up and down in the stay position

Exercise # 10 Knee to Chest: Both the knee pressing and legs raising may be done on exhale. In such a case, press the knees to the chest while exhaling. Bring the knees away from the chest while inhaling. Raise legs towards the ceiling while exhaling.

***Description of Exercise # 1 (Supine/Seated) Conscious Breathing:**

Lie down and make yourself comfortable. Put a folded blanket under your back to raise the lower and upper chest. Use additional blanket or small pillow under your neck and knees to be comfortable. Feet are comfortably apart and turned out. If you feel stress in the back, bend your knees and place feet flat on the floor. Arms at sides, palms turned up, few inches away from the body and shoulders in contact with the floor and relaxed. Relax your forehead and the entire face. Relax both arms and shoulders. Relax both legs and hips. Relax the entire upper body. Relax the whole body from head to toes. Don't go to sleep. Stay AWAKE but relaxed!

Bring your attention to your breath and let it relax. As you inhale feel the breath moving down from chest into the abdomen and pelvis. As you exhale, feel the breath moving upward from pelvis and abdomen to the nostrils. Maintain the feeling of breath flowing downward as you inhale and the breath flowing upward as you exhale. Take 6-12 breaths with such a feeling.

Adaptation: If lying down is not comfortable, sit in a chair and follow the above guidelines for relaxed and conscious breathing.

B. Breathing:

1) (Supine) "joint breathing"	3-5 minutes
2) (sitting) humming breath	6 x
3) (sitting) vowel singing	6 x

1. Supine/Seated "Joint Breathing:"

(3 breaths each joint—approximately 5 minutes)

Lie down and make yourself comfortable. Use rolled blanket or small pillow under your neck and knees to be comfortable. Feet are comfortably apart and turned out. If you feel stress in the back, bend

your knees and place feet flat on the floor. Arms at sides, palms turned up, few inches away from the body and shoulders in contact with the floor and relaxed. Relax your forehead and the entire face. Relax both arms and shoulders. Relax both legs and hips. Relax the entire upper body. Relax the whole body from head to toes. Don't go to sleep. Stay AWAKE but relaxed!

Bring your attention to your breath and let it relax.

- Every time inhale "as if" inhaling through the crown of your head and exhale "as if" through the joint mentioned each time
- Inhale as if through the crown and exhale as if through the toes (3 x)
- Inhale as if through the crown and exhale as if through the ankle joints (3 x)
- Inhale through the crown and exhale through the knees (3 x)
- Inhale crown and exhale hip joints (3x)
- Inhale crown and exhale pelvis and perineum (3 x)
- Inhale crown exhale solar plexus (3 x)
- Inhale crown Exhale heart region (3 x)
- Inhale crown exhale pit of the throat (3 x)
- Inhale crown exhale center of the eyebrows (3 x)
- Inhale crown exhale back to the toes (3 x)
- Inhale! Exhale as if the whole body is breathing (3 x)
- Open eyes and take a gentle stretch

***If your breathing is not stabilized yet, do a few more repetitions of the whole body breathing.**

2. (Sitting) Humming Breath (6 breaths):

In a seated position, press the tip of your tongue against the hard palate and make a soft humming sound such as "hummm....." As you begin to approach the end of your breath, exhale without the humming sound. Instead of producing humming sound of the beetle, if you prefer, you may sing a short line of your favorite song. Again, as you approach the end of your breath, exhale without the humming sound.

3.(Sitting) Vowel Singing (6 breaths)

In a seated position, sing the vowels (Ah, EE and OO) slowly and gently. As you begin to approach the end of your breath, exhale softly without the vowel sound.

"Ā Ā Ā Ā" 2 x

"EEEE....." 2 x

"0000....." 2 x

Exercises for Breath Awareness and Controlled Breathing

Breath awareness is instrumental for assuming control of breathing. For example, it helps to know the number of breaths you normally take in a minute, the length of your normal exhalation and inhalation, and how much these numbers change when you are under stress and excitement.

Breathing in Stillness

In order to perform the exercises for breath awareness and breath control, sit or lie down in a comfortable but in a straight and well aligned posture. Relax mentally and physically, preferably in a state of deep relaxation or meditation. To measure the length of your breath, count silently in your head, e.g. “One thousand one” “One thousand two” “One thousand three.” It takes approximately one second to silently say, “one thousand one,” but you may utilize other methods for tracking time such as a stopwatch or a metronome beep.

Never strain your breath. Stay within your comfortable capacity. If your experience heart start racing, shortness of breath or rapid breathing, stop! Take a few normal breaths or do PLB until you are breathing normally.

1. Determine your usual breathing rate: Count the number of breaths you take in one minute at rest in different body positions, namely, sitting, lying down and standing. Simply count the number of your exhalations for one minute to calculate the total number of breaths in one minute.
2. Determine your breathing rate under stress: Count the number of exhalations for one minute when you are feeling anger, anxiety, sadness, excitement and mental, physical or emotional stress.
3. Determine the normal length of your inhalations and exhalations (I/E): Count silently as you start inhaling, for example, “One thousand one” “One thousand two” “One thousand three” and so on until the end of the inhalation. Count similarly during the exhalation.
4. Lengthen your exhalation relative to inhalation as I/E 1 to 1.5 or 1: 2. For example, if your inhalation is to a count of 4 seconds, gradually increase exhalation to a count of 6 seconds and then for 8 seconds, if possible.
5. Lengthen both your inhalation and exhalation while maintaining the I/E ratio of 1 to 1.5 or 1:2
6. Practice “cyclical breathing.” Let your inhalations smoothly transitions into exhalation and vice versa forming a continuous cycle of smooth breathing.
7. Relax and count your exhalations backward starting from 10 to 0. Over time increase the top number such as 20 to 0 or even 30 to 0. When lose track of the count, start all over again.
8. Work on slowing down your breathing from 12-15 b/m to down to 6-, 5- or 4 b/m still maintaining exhalation longer than inhalation. For example, in 4 breaths a minute, inhalation may be for 6 and exhalation for 9 seconds.
9. Practice “end-inhalation breath holding.” After normal inhalation, briefly hold your breath for 1-4 seconds. Gradually over time increase the breath holding time (BHT) to 5 or 6 seconds.
10. Practice “end-exhalation breath holding.” After normal exhalation, briefly hold your breath 1-2 seconds. Gradually, over time, increase BHT to 3 seconds or longer.
11. Practice both “end-inhalation breath holding” and “end-exhalation breath holding” in the same breath cycle. You may keep end-inhalation BHT longer than end-exhalation BHT. Be patient and take your time in increasing BHT.
12. Practice under breathing. Deliberate and conscious under breathing is opposite of what yogis usually ask “Take a long breath” or “Breathe deeply.” But during times when you are constantly breathing rapidly, lungs are hyper inflated and CO2 level is going down lungs, taking small and shallow breath and prolonging the pause between in breath and out breath may help you to slow down your breathing. Mindfully and gradually take small and shallow breaths and when the breath seems to be calming down, work on lengthening the pause.
13. Practice 2-stage exhale (*Viloma Krama*). Inhale! Exhale first half of the breath while gently contracting abdomen from pubic bone to the navel and then exhale the second half of the breath while gently contracting from navel to sternum.

Where do you feel your breathing most?

#1. Hands on lower tummy, middle finger tips touch navel-- 2 breaths

#2 Hands ½ way between navel and breastbone tip– 2 breaths

#3 Pinch and separate the skin at the lower ribs –2 breaths

Spinal direction and breath coordination guideline

<u>Going into pose</u>		<u>Stay (optional)*</u>	<u>Coming out of pose:</u>
Vertical Extn.	Exhale (inhale)	(inhale)	Exhale (inhale)
F.B.	Exhale	(inhale)	exhale (inhale)
B.B.	Exhale (inhale)	(inhale)	exhale
S. B.	Exhale	(inhale)	Exhale (inhale)
Twist	Exhale	(inhale)	Exhale (inhale)

*Inhale in parentheses for dynamic and stay positions is optional for people at higher fitness level. If you are severely challenged avoid them until you've made sufficient progress. If you prefer do continuous soft breathing or PLB while practicing poses all the time or when you suspect your breath and/or heart is speeding up.

To be cautious, exhale while moving in and out of the poses and inhale during the stay or neutral position. But if it is not strenuous inhale while going in, staying or coming out of a pose. Curb the tendency for holding breath unless intentional

Pursed Lip Breathing (PLB):

PLB is clinically reported to improve arterial oxygen saturation (SaO₂) and CO₂ removal as well as relieving dyspnea.^{iv} PLB by patients with COPD promotes a slower and deeper breathing pattern both at rest and during exercise, while prolonging expiratory and total breath durations, particularly at rest. But PLB during exercise is capable of relieving dyspnea for some patients but not others.^v

Whenever you notice the first sign of accelerated breathing or shortness of breath, relax your mind and body and start the PLB. A helpful phrase to remember about PLB is, "Smell the rose and blow out the candle." Smelling the rose with your nose is the inhalation. In order to exhale, purse your lips like you are going to blow out a candle or kiss a baby. However, we need to refine the PLB skill to receive maximum benefits with these guidelines: Exhale slowly, smoothly, evenly and consistently like when the gentle wind blows the light of the candle flickers but does not extinguish. Another helpful imagery is like when you are cooling that hot soup in the spoon you are holding.

When experiencing breathing discomfort, we want to breathe hard and fast to get a relief from but that would be counterproductive. PLB helps because it builds positive air pressure (PAP) in your lungs. You have to fine tune your PLB to determine what works

best for you. For some a helpful PAP is soft blowing and for others a little harder pressure. For example, some like to stiffen their lips while pursing them and others find it helpful to keep their pursed lips soft. Whatever you do, maintain a consistent flow of breath and avoid a “see-saw” breath. Furthermore, your exhalation should smoothly transition into inhalation before you feel rushed to breathe in. Slowly and steadily work on making exhalation slightly longer than your inhalation. Continue PLB until you get a relief from dyspnea.

Utilize body positions that help with dyspnea:

Helpful body positions are those that allow chest expansion, help the diaphragm to move easier and minimize the use of accessory breathing muscles especially the neck and shoulder muscles. Slightly leaning the chest forward while sitting or standing and relaxing the neck and shoulders facilitates the movement of the diaphragm while poor body positions such as tensed up shoulders and “forward head” restricts the breath flow.

When experiencing shortness of breath (SOB), do the following:

While standing, rest your hands over your knees, relax, slightly lean forward and do PLB

While sitting, relax, rest your arms on a table (or rest your forehead in your hands), slightly lean your chest forward and do PLB.

Reduce breathing-related anxiety: Anxiety and panicky thoughts, especially related to breathing, are likely to escalate the breathing discomfort.

Breathing related anxiety is one of the reasons why you might avoid some activities or exercise lest the exertion make SOB more severe.

Good news is that the anxiety related to breathing and exertion can be modified. You can learn breathing techniques and anxious thought modifications in order to gain psychological control over your breathing. Be patient and witness progress in your efforts for gaining control over your Dyspnea. Then you begin to feel confident in your ability to control dyspnea at will. By the same token, the anxiety that your breathing will get out of control diminishes. There are Internet sites you can visit for more tips on anxiety and panic related to breathing

Perform a wide variety of exercises and activities:

In addition to your yoga practice of postures and breathing techniques, perform a wide variety of exercises for strength and endurance including such exercises as lifting weights, treadmill, cross country, walking, bicycling, rowing etc. Likewise, engage in a wide variety of activities such as stair climbing, vacuum cleaning, taking the trash, combining mall walking and shopping, etc.

Pacing your breathing with activity/exertion:

Example of poor pacing: Say you begin walking or jogging on a treadmill. You pick up the speed too fast and too soon. As your breathing accelerates you start breathing harder and faster to catch your “running breath.” This would only make the SOB worse. Example of good pacing: However, in the same example, when your breathing accelerates, slow down the treadmill speed. Gain control over your breathing and then gradually, in small increments, increase your speed. In this way, you can exercise longer, handle higher speed and still stay within your comfortable zone. Matching between your breathing rate and the level of exertion is called “pacing.”

Learning how to pace your breathing and exercise or activity is important because this can help you to more fully access the level of exertion and challenge possible within your capacity.

Use the pacing skill while doing yoga postures. Perform yoga poses slowly and steadily while maintaining your breathing in a comfortable range. Avoid trying to do maximum number of poses in the shortest time.

Quit smoking

It is no exaggeration that quitting smoking is the most beneficial thing you can do to prevent further damage to your lungs and to slow down the progress of the disease.

Join a support group

Support groups can be a tremendous source of information, solution-oriented thinking and mutual support. If there is no support group in your area, join an online support group

Attend a pulmonary rehabilitation program (PRP)

If you qualify for PRP and there is one available in your area, join it. Medicare usually reimburses for 12 weeks of PRP for qualified patients. PRP participants are supposed to receive supervised assessment of their exercise tolerance. You would perhaps wear an EKG and an oximeter while exercising and RT or nurse is present to monitor your heart and lungs. In addition to that you would learn about activity pacing, breathlessness control, nutrition and advice on adjustment of supplemental oxygen during exercise

ⁱ Living Well with COPD: Chronic Bronchitis and Emphysema, Patient Education Guide (Product Code 5032) American College of Chest Physicians, Northbrook, IL <http://www.chestnet.org>

ⁱⁱ The National Heart, Lung and Blood Institute (NHLBI) COPD Data Fact Sheet: http://www.nhlbi.nih.gov/health/public/lung/other/copd_fact.htm The Fact sheet states “12.1 million adults ages 25 and over reported being diagnosed with COPD in 2001. About 24 million adults have evidence of lung impairment indicating that COPD is underdiagnosed.” National Emphysema/COPD Association (NECA) and various other patient organizations cite 15 to 19 million people diagnosed with COPD and equal number of people undiagnosed.

ⁱⁱⁱ *Pocket Guide to COPD Diagnosis, Management, and Prevention.*

Summary of patient care information for primary health care professionals. 2006

<http://www.goldcopd.com>

^{iv} Brian L. Tiep MD, Mary Burns R.N., Daniel Kao MD, Roberta Madison DPH and Jackie Herrera: Pursued Lip Breathing Training Using Ear Oximetry, CHEST Vol 90 p 218-221 August 1988 issue

^v Jadranka Spahija, Michel de Marchie and Alejandro Grassino (2005) **Effects of Imposed Pursued-Lips Breathing on Respiratory Mechanics and Dyspnea at Rest and During Exercise in COPD Effects** *Chest* 2005;128;640-650