

## **PROPER BREATHING TECHNIQUES**

Learn to breathe correctly. It is called diaphragmatic breathing with pursed-lips during exhalation. Once you've mastered it, it will aid you in the other exercises and assist you in any form of exertion. This will become your normal way of breathing.

Diaphragmatic breathing is not a new idea and not the exclusive concern of people with COPD. Athletes, singers, yoga enthusiasts and many others learn how important proper breathing techniques are. They experience how relaxing it can be and gain additional energy from this form of breathing.

Diaphragmatic breathing will make you aware of the diaphragm. Normally the diaphragm does about 80% of the work of breathing; however, people with COPD have often let the upper chest and neck muscles take over much of the work of breathing. This rapid, shallow way of breathing requires more oxygen; therefore, it is essential to retrain the diaphragm and use it properly for easier breathing.

Pursed-lip breathing will slow down the breathing rate and will create a back pressure which helps the airways in the lungs to remain open, thus, aiding in the removal of trapped air. Pursed-lip breathing is easier to learn than diaphragmatic breathing and should never be omitted when you are experiencing shortness of breath. It is not necessary, however, to always exhale through pursed-lips. When you are resting, relaxing or sleeping, inhaling and exhaling through the nose is usually all that is required for comfortable breathing.

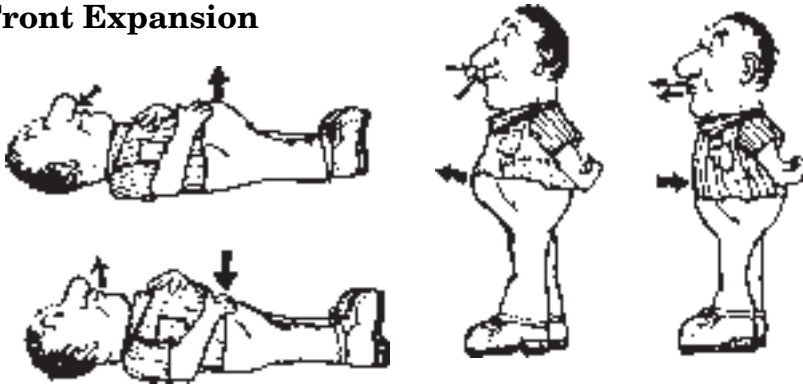
These techniques of breathing do not change what is basically wrong with the lungs but will significantly improve the breathing pattern. It is also important to understand that this type of breathing is effective only while it is being practiced.

**To make you conscious of the diaphragm, take time right now to find it and feel it working:**

- Place one hand on the upper portion of the stomach just a few inches above the navel, below the breast bone.
- Sniff in several small inhalations per breath through the nose. The movement in that area is the diaphragm - working at its best.

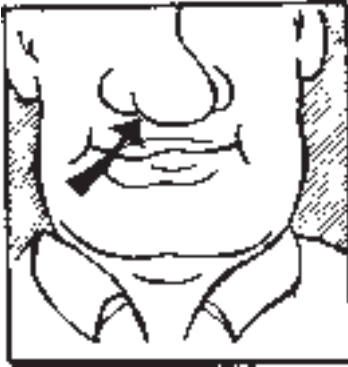
## **How To Breathe Diaphragmatically With Pursed-lips**

### **Front Expansion**



1. Lie down, sit or stand. A reclining position is usually the easiest for beginners.
2. Place one hand on the upper portion of the stomach in order to feel the diaphragm working and to feel the stomach filling up as if with air. Place the other hand on the upper chest in order to detect movement in that area. Too much movement of the upper chest should be avoided. Upper chest breathing is tiring and not as productive.
3. Purse lips slightly as if to whistle.
4. Exhale slowly through pursed-lips while slightly contracting your stomach muscles, taking care not to force all the air out.

5. Inhale (sniff) slowly through the nose. Remember how you felt the diaphragm work. Feel the stomach rising.

*Inhalation**Exhalation*

6. Pause slightly. Note: The slight hesitation is as long as it takes to purse the lips for exhalation.
7. Exhale slowly through pursed-lips. Note: As you become more aware of pursed-lip breathing, you will notice the stomach muscles slightly contract.
8. Inhale through the nose. Pause. Exhale through pursed-lips. In 1. 2. Out 1. 2. 3. Note: Exhalation should be just slightly longer than inhalation.

### **How To Inhale Through The Mouth**

There are many times when it is impossible to inhale through the nose. Mouth breathing may seem easier. However, when inhaling through the mouth, a person has the tendency to breathe with the upper chest. While talking, we inhale through the mouth. Have you ever become short of breath simply talking?

If you have a sinus condition or other blockage of the nasal passages, it is very difficult to inhale through the nose; and, certainly, when you are short of breath, inhaling through the nose is almost impossible.

Become a good mouth breather when it is necessary

to inhale through the mouth by practicing diaphragmatic breathing as just described. Follow all steps except when directions say inhale through the nose, inhale through the mouth. It is important to practice mouth breathing daily because there will always be occasions when you will need to inhale properly through the mouth. Note: A person can even better improve mouth breathing when it is necessary and also strengthen the diaphragm as well by exercising with the Breather. (See pages 42-45.)

### Side Expansion

This is another method for practicing diaphragmatic breathing in which you will notice expansion of your lower ribs.

1. Sit comfortably with good posture or stand.
2. Place your hands on your sides at the base of your ribs, thumbs to the back - fingers pointed forward.
3. Exhale slowly through pursed-lips. Feel your rib cage sink down and in.
4. Inhale slowly through the nose. Feel the pressure on your hands as your rib cage expands.
5. Pause slightly. Note: The slight hesitation is as long as it takes to purse the lips for exhalation.
6. Exhale slowly through pursed-lips taking care not to force all the air out.



7. Inhale through the nose. Pause slightly. Exhale through pursed-lips. Inhale 1. 2. Out 1. 2. 3. Note: Exhalation should be just slightly longer than inhalation.

### **Helpful suggestions For Learning Proper Breathing**

1. Begin the breathing cycle with exhalation through pursed-lips. Pursed-lip breathing causes the stomach muscles to slightly contract, helping to push the diaphragm upward to aid in exhalation.
2. Do not continuously hold the stomach in as it is important for the stomach to relax during inhalation.
3. When practicing, if you wish, lie down and place weights up to 10 pounds on the mid-portion of the stomach. This will strengthen the diaphragm and the abdominal muscles. Abdominal muscles play a very important role in both breathing and coughing.
4. If you can, hold your breath for a split second before exhaling. This will allow for even better gas exchange to rid the lungs of excess carbon dioxide and pick up additional oxygen.
5. When practicing diaphragmatic breathing, exaggerate each step. Allow the stomach to come out as far as it can during inhalation. Contract the stomach muscles, pulling them in as much as possible during exhalation. Once mastered, this technique of breathing will become automatic; therefore, it will not be necessary to exaggerate each breath unless breathing becomes out of control or during practice for better conditioning.
6. During each breathing cycle, you should not try to inhale or exhale as much air as possible. This could cause you to overventilate; however, sighing or yawning is nature's way of giving you very large

- breaths when the body needs additional air.
7. Some people may find diaphragmatic breathing quite difficult especially while standing or walking. In such a case, simply leaning slightly forward will allow gravity to pull the stomach outward during inhalation.
  8. Pursed-lip breathing should be practiced often, especially if you become short of breath when you walk, exercise or exert yourself. Pursed-lips breathing causes the stomach to slightly contract forcing the diaphragm upward to aid in better exhalation and to minimize trapped air.

### Review Of Proper Breathing

1. Place hands on chest and stomach.
2. Inhale through the nose.  
... pause slightly.
3. Exhale through pursed-lips.



### Why should you practice diaphragmatic ?

1. It helps you relax.
2. It strengthens and reactivates the diaphragm.
3. It helps to overcome upper chest breathing and promotes deeper breathing.

### Is there any additional therapy that can be done to increase the strength of the diaphragm?

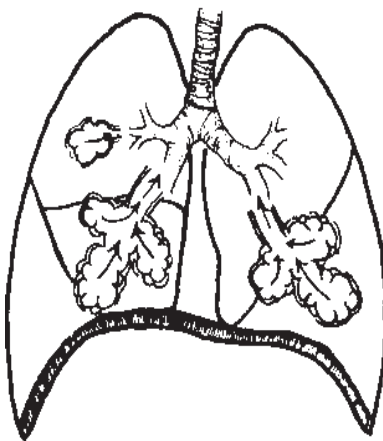
The diaphragm and some of the other respiratory muscles (small muscles between the ribs) may increase in

strength and endurance with inspiratory muscle training. This training is achieved via a mechanical aid (The Breather) by inhaling through progressively smaller resistances for prescribed periods of time. It is important to follow the manufacturer's instructions when using the Breather. (See pages 42-45.)

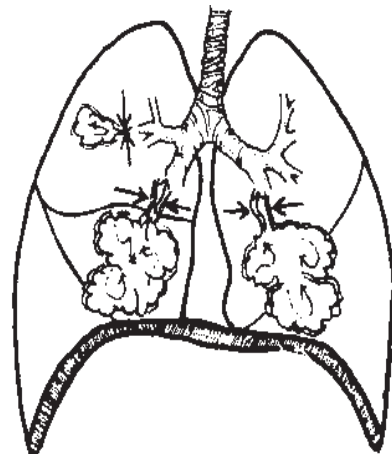
### Why should you practice pursed-lip breathing?

1. It significantly slows down the breathing rate.
2. It increases intrabronchial pressure (pressure inside the airways). This increased pressure helps the airways of the lungs to remain open, thus, aiding in the removal of **trapped air** from the lungs.

This is an enlarged illustration of air sacs and bronchial airways within the lungs demonstrating the effect of pursed-lip breathing and the effect of breathing without pursing the lips.



*Bronchial tubes remain open.*



*Bronchial tubes collapse.  
air becomes trapped  
in the lungs.*

## **How do you know if you have trapped air in the lungs?**

This is sometimes difficult to recognize; however, you should realize that trapped air in the lungs can be destructive. The air may become trapped behind weak bronchial tubes and/or mucous plugs or trapped during bronchospasm. With more air entering the lungs during every inhalation and not enough air leaving during exhalation, trapped air results.

The following may help you to detect trapped air:

1. Increased tightness across the upper chest.
2. Inability to take a deep, diaphragmatic breath.
3. Increased tightness between the shoulder blades.
4. Rapid breathing.

## **How can you avoid trapped air?**

It may be impossible to avoid trapped air completely; however, try to avoid it by using proper breathing as much as possible and by doing the Panic Control Techniques when trapped air becomes a problem.

(Appendix C)

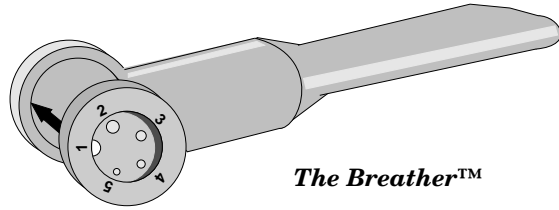
## **Inspiratory Resistive Breathing Training**

Specific respiratory muscle training has been shown to improve strength and endurance of the respiratory muscles of patients with chronic obstructive pulmonary disease. It has been demonstrated that respiratory muscle training can improve the maximal inspiratory and expiratory forces as well as the maximal sustained ventilatory capacity (MSVC), which are objective measures of respiratory muscle work capacity.

While there are several inspiratory resistive breathing devices available, the Breather is represented in this

manual. In addition to inhalation resistance, the Breather includes expiratory resistance to prevent air trapping. Expiratory resistance comfortably mimics “pursed-lip breathing” which is necessary for COPD patients.

It may be difficult to isolate exactly what part of a training program could make a patient with COPD feel better - stronger. Whole body exercise is important. Your arms and legs need exercise. So



*The Breather™*

to do your breathing muscles. When you exert yourself, you have an increased demand for more oxygen; and, you may have to limit your exercise because you breathe too fast and feel you cannot get in enough air. Inspiratory resistive breathing training can help you overcome the feeling of losing your breath.

Most exercise programs concentrate on arm and leg movements almost exclusively and neglect the need to mobilize the ribs and strengthen the muscles of respiration. As a person becomes older, chest mobility and the strength of the respiratory muscles become weaker and this, in turn, limits the rest of the body to do work. Your total body fitness program can become easier if your respiratory muscles become stronger.

By simply using the Breather approximately 30 minutes a day, your respiratory muscles can increase in strength and endurance when trained by specific respiratory maneuvers. The theory behind the Breather is if energy supplied to a muscle (that muscle being the diaphragm) is less than the energy demand, the muscle fatigues - gets tired. The other chest muscles must do the work of breathing and these muscles are not as strong as a properly functioning diaphragm. The diaphragm can increase in strength and endurance via the Breather by inhaling against progressively greater degrees of resistance. (*Figure 1*) The effect of

inspiratory resistive breathing is a combination of how long you are willing to practice and with what degrees of resistance. The resistance you use should be easily tolerated for 30 minutes daily; however, your physician, nurse or therapist may wish to help

you select a desired inspiratory resistance setting and a recommended initial training time to begin training.

To date, it is emphasized that long term conditioning, rather than short term conditioning is advisable. That means conditioning for the rest of your life! But it is easy. **People even call the Breather the lazy man’s way to exercise.**

The Breather is constructed of 5 parts - the T shaped manifold, the mouthpiece, the inhalation and exhalation port hubs, and the rubber diaphragm on the exhalation side of the breather. The material of the Breather is made of GE Lexan, grade H P which is a medical grade. This means it cannot be ruined while easily disinfecting it in either boiling water or a disinfecting agent. The inhalation resistance is set by rotating the hub numbered 1 through 5, with setting #1 providing the least resistance. (See Figure 1.) Exhalation resistance is a function of the settings of both hubs. The exhalation hub has a valve (the rubber diaphragm) which prevents

inhalation through it; whereas, the inhalation hub has free flow during inhalation and exhalation. (See Figures 1 & 2.) Therefore, it is possible to have a greater exhalation area than inhalation area. In other words, exhalation resistance

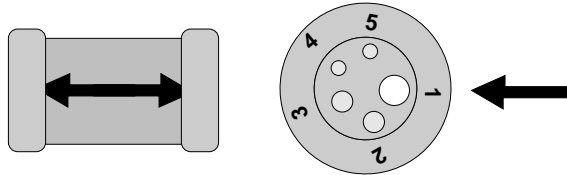


Figure 1, Inhalation

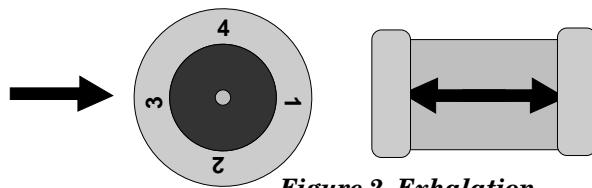


Figure 2, Exhalation

is not as great as inhalation resistance. The combination of inhalation and exhalation resistances will vary greatly depending on your needs and program training.

You probably are beginning to realize how the Breather works. You inhale against varying degrees of resistance for a period of time in order to improve the strength of your breathing muscles. Now, you may be questioning why is there resistance during exhalation. **This exhalation resistance is what makes the Breather so unique. It is the only resistance trainer on the market which so cleverly combines both inhalation and exhalation resistances creating total breathing comfort while exercising.** You recall how important pursed lip breathing is, especially if you are exercising or are short of breath? It is the exhalation resistance which mimics your pursed-lip breathing that helps you to prevent trapped air, stale air, which is low in oxygen.

Please use your Breather only as directed for best results; and, if you should experience shortness of breath, increased heart rate or any respiratory problems, consult your doctor, nurse or therapist. Resume your training program with their approval.