



Chronic Obstructive Pulmonary Disease (COPD) December 1998

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CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

WHAT IS COPD?

Chronic Obstructive Pulmonary Disease (COPD) is a term used to describe lung diseases in which there is difficulty getting air into and out of the lungs. COPD includes the following lung problems: emphysema, chronic bronchitis or a mixture of both. Although emphysema and chronic bronchitis differ in the way they cause problems with air exchange, they have similar symptoms. The next few pages describe the specific problems of emphysema and chronic bronchitis.

HOW IS THE DIAGNOSIS MADE?

- review of your symptoms
- physical examination
- chest x-ray
- pulmonary function tests
- blood tests

WHAT CAUSES COPD?

The causes are numerous, and heredity may be a factor in a person's tendency to develop these diseases. One of the main and most controllable causes is cigarette smoking. Other causes include occupational exposure to respiratory irritants, and air pollution. All forms of respiratory disease may be made worse by smoke, air pollution, occupational hazards, dust, fumes and infections.



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WHAT HAPPENS WHEN WE BREATHE?

Air rich with oxygen enters the respiratory system through the nose (primarily) and the mouth, where air is filtered and warmed before it travels to the windpipe (or trachea). Air then travels through a series of airways or tube-like structures that get smaller and smaller (the bronchi and bronchioles). These tubes end in the air sacs or alveoli. The alveoli are balloon-like thin walled structures. It is here where oxygen is exchanged for carbon dioxide in the blood. The blood is then circulated through the arteries to give cells the oxygen they need.

WHAT HAPPENS WITH COPD?

In emphysema, the air sacs are damaged and distorted. This can interfere with oxygen getting into the blood and carbon dioxide being removed.

In chronic bronchitis, there is long-standing irritation of the airways. In addition, there is excessive mucus production. As in emphysema, both oxygen intake and carbon dioxide removal can be impaired and distorted.



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WHAT IS EMPHYSEMA?

Emphysema is a chronic condition in which the air sacs (alveoli) become enlarged or damaged.

Signs and Symptoms

- uncomfortable breathing
- rapid breathing especially with exertion or increased activity
- lowered concentration of oxygen in the blood. In some cases, carbon dioxide levels may be increased.
- cough
- fatigue, lack of energy
- decrease in appetite

Onset

- Gradually develops over time



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WHAT IS CHRONIC BRONCHITIS?

Chronic bronchitis is a chronic inflammatory condition of the airways. It results in increased mucus production and a chronic cough.

Signs and Symptoms

- excessive mucus production
- uncomfortable breathing
- rapid breathing especially with exertion or increased activity
- lowered concentration of oxygen in the blood. In some cases, carbon dioxide levels may be increased.
- cough
- fatigue, lack of energy
- decrease in appetite
- shortness of breath
- wheezing

Onset of Symptoms

- Gradually develop over time



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HOW IS COPD TREATED?

Goals of treatment are to:

- restore normal oxygen levels
- decrease airway narrowing
- control cough and sputum production
- avoid irritants
- reduce inflammation
- improve exercise tolerance or ability to perform activities of daily living



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METHODS OF TREATMENT

Medications

Bronchodilators

- drugs that relax the airway muscles
- major types of bronchodilators include:
 - 1) sympathomimetics
 - 2) xanthines
 - 3) anticholinergics

Steroids

- drugs that decrease inflammation

Chest Physical Therapy

- helps raise secretions
- helps control coughing
- helps with breathing techniques
- helps increase ability to exercise

Occupational Therapy

- helps with organizing home and work environments to conserve energy and decrease shortness of breath

Oxygen Therapy

- may be useful in some cases



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MEDICATIONS

The following is an overview of the common types of medications used to treat COPD. These medications include: steroids which are used to decrease inflammation and bronchodilators which are used to open the airways. A list of commonly used medications is attached. Information sheets on specific drugs are available. Ask your nurse for a copy.

STEROIDS

- can be given in inhaled form, using a MDI (Metered Dose Inhaler) orally or by IV. The form most commonly used is the aerosol form although; in some cases, oral or intravenous (IV) forms may be needed.
- not used to treat an acute attack.

AEROSOL STEROIDS

- taking steroids in an aerosol or inhaled form reduces the side effects that may occur when these drugs are taken orally.
- follow your doctor's instructions closely.
- take exactly as prescribed. There is no evidence that taking more than the recommended amount will reduce the frequency of attacks.
- the most common side effect that can occur is thrush, a local fungal infection in the mouth. Thrush and hoarseness can usually be decreased by using a spacer. Side effects such as weight gain, fluid retention, decreased immune system or reduction in the amount of cortisone the body normally produces can occur but are less likely when steroids are taken in an aerosol form.



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- if your condition is not controlled with inhaled steroids, it may be necessary to use other drugs in addition to them or take the steroids in tablet form.

ORAL STEROIDS

- may be needed in some cases, especially if symptoms are increasing.
- follow your doctor's instructions exactly.
- if they are to be discontinued, the dose may be tapered (slowly reduced each day) to prevent problems.
- should be taken with food or milk to reduce stomach upset.
- side effects include those listed for inhaled steroids. Effects such as weight gain, fluid retention, decreased immune system response or reduction in the amount of cortisone the body normally produces are more likely to occur if taken orally for a period of time.
- side effects not usually a problem if taken for short period of time.

IV STEROIDS

- used in an emergency/hospital setting.



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BRONCHODILATORS

- drugs that relax the airways.
- there are two major categories: Sympathomimetics and Xanthines.

Sympathomimetics

- act to dilate or expand the bronchial walls, allowing more air to move in and out of the lungs.
- are naturally occurring hormones that act on many parts of the body including the heart and blood vessels, but newer aerosol forms act mainly on the respiratory system.
- can be given several different ways including inhaled forms, tablet form or intravenously (for emergency use only).
- most common side effects include nervousness, tremors, loss of appetite, dry mouth and restlessness. In some cases the heart rates may change.
- most common side effects usually only last a short time and most people can tolerate them.
- if possible danger signs, such as palpitations, chest tightness or unusual feeling in the chest occurs, contact your doctor.
- in some cases, they may only be used on an “as needed” basis.
- resistance to these drugs can develop so **do not** use more than the recommended dose. If you notice that this medication does not work as long or as well as it had in the past, call your doctor.



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Xanthines (Aminophylline and Theophylline)

- forms used include tablet or liquid form.
- dose needs to be carefully monitored and blood levels should be taken regularly; too little will not have any effect and too much will cause unfavorable side effects.
- may interact with other medications, especially antibiotics, so tell your doctor what medications you are taking including over the counter medications such as diet pills, cold and cough medicines.
- side effects (possible danger signs) include restlessness or irritability, nausea, vomiting, headache and diarrhea. Contact your doctor if these symptoms occur.

Ipratropium (Atrovent)

- is a bronchodilator
- ipratropium's mechanism of action is different than the sympathomimetics or xanthines. Ipratropium inhibits the vagus nerve.
- for best results, it should be used on a regular basis.
- should not be used to treat an acute episode of bronchospasm
- side effects (possible danger signs) can include dry mouth or throat.



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Leukotriene Receptor Antagonist (used for Asthma)

- new drugs that decrease inflammation (narrowing) of the airways.
- used to prevent attacks and, if prescribed, should be taken even if you have no symptoms.
- not intended to treat an acute asthma attack.
- may rarely be taken in combination with inhaled steroids and/or bronchodilators.
- may cause headache, but usually not severe enough to require the drug be stopped.
- other side effects (possible danger signs) may include stomach upset or liver problems. Report any flu-like symptoms or yellowing of the skin (signs of liver problems) to your doctor.
- may interact with several drugs so tell your doctor and pharmacist all drugs you are taking.



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LIST OF MEDICATIONS USED TO TREAT COPD AND ASTHMA

Aerosol Inhaler Steroids

GENERIC	BRAND NAME
budesonide	Pulmicort, Rhinocort
beclomethasone	Vanceril, Beclovent
flunisolide	Aerobid, Aerobid M
triamcinolone	Azmacort, Nasacort (nasal)
fluticasone	Flovent

Oral Steroids

GENERIC	BRAND NAME
prednisone	Deltasone, Orasone, Liquid Pred (liquid), Sterapred

Bronchodilators

Beta Antagonist

GENERIC	BRAND NAMES
albuterol	Proventil, Ventolin
metaproterenol	Alupent
pirbuterol	Maxair
salmeterol	Serevent (long acting form)
isoproterenol	Isuprel
bitolterol	Tornalate

Xanthines

GENERIC	BRAND NAMES
aminophylline	Aminophylline
terbutaline	Brethine



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theophylline	Elixophyllin, Slo-Phyllin (Slo-bid), TheoDur, Theo-bid, Theolair (Uniphyl)
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Miscellaneous

GENERIC	BRAND NAMES
nedocromil	Tilade
Ipratropium	Atrovent
Cromolyn sodium	Intal
Ipratropium + albuterol	Combivent

Leukotriene Receptor Antagonist

GENERIC	BRAND NAME
Zafirlukast	Accolate
Zileuton	Zyflo
Montelukast	Singulair

Mucolytic

GENERIC	BRAND NAME
Acetylcysteine	Mucomyst



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AEROSOL THERAPY

- a quick and effective way to deliver medication directly to your airways and lungs.
- because the normal airways are designed to protect your lungs from inhaled particles, proper technique is essential when using aerosol medications.
- medications commonly given via aerosol are:
 - steroids
 - bronchodilators
 - anti-inflammatory medications

Types of Aerosol Therapy Devices

- metered dose inhalers, also known as MDIs (most commonly used).
- dry powder inhalers.
- small volume or hand-held nebulizers.

With all three types, it is important that you use them correctly and use proper breathing techniques.



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METERED DOSE INHALERS (MDIs)

- small pressurized canister containing several hundred metered doses of medication.
- to be effective, you must coordinate your breathing pattern with release of the medication. Improper technique may cause medication to not reach airways or lungs.
- if taking both a bronchodilator and a steroid, use bronchodilator first. Use the steroid a few minutes later. The bronchodilator “opens” the airway so the steroid can penetrate.

SPACERS are devices that are used with MDIs to help ensure that medications are delivered to airway and lungs. They also reduce side effects like thrush and voice changes.

- allow time for aerosol to shrink to a smaller size and prevent them from depositing in back of throat instead of lungs.
- recommended for steroid inhalers to help minimize the development of thrush, a local fungal infection.
- greatly simplify the coordination need for proper metered dose inhaler use.

Following are the proper techniques for using a Metered Dose Inhaler (MDI) alone or with a spacer.



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Use of MDI without Spacer

1. Warm canister to room temperature by holding it in your hand.
2. Assemble canister into mouthpiece and remove cap.
3. Shake canister vigorously.
4. Hold inhaler upright.
5. Open mouth.
6. Hold mouthpiece of inhaler about 1-2 inches from mouth.
7. Exhale fully.
8. Activate MDI.
9. Begin to breathe in slowly.
10. Continue to breathe in until your lungs are full.
11. Hold your breath for 4-10 seconds.
12. Wait 3-10 minutes between prescribed puffs.
13. Rinse mouth and throat if using steroid inhaler.
14. Follow separate instructions for MDI care.



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Use of MDI with Spacer

1. Warm canister to body temperature by holding it in your hand.
2. Shake canister vigorously.
3. Remove caps; assemble MDI mouthpiece and spacer.
4. Hold canister upright.
5. Place mouthpiece in mouth.
6. Close lips around mouthpiece.
7. Exhale fully.
8. Activate MDI.
9. Breathe in slowly from spacer.
10. Continue to breathe in until your lungs are full.
11. Hold your breath for 4-10 seconds.
12. Repeat inspiration with breath hold if indicated by spacer manufacturer.
13. Wait 3-10 minute between prescribed puffs.
14. Rinse mouth and throat if using steroid inhaler.
15. Follow separate instructions for MDI care.



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CARE OF MDIs

Cleaning

1. Rinse mouthpiece daily in water to keep it clean.
2. Once each week, disinfect the mouthpiece assembly:
 - prepare solution of $\frac{1}{2}$ white vinegar and $\frac{1}{2}$ water (equal parts)
 - soak mouthpiece assembly in vinegar-water solution for 20-30 minutes
 - rinse well with water
 - allow to dry thoroughly

To determine how full the canister is:

1. **Preferred method:** Calculate expected last dose and mark on box or calendar.
For example:
 - Container has 200 activations
 - You use 2 puffs 4 X a day = 8 activation/day
 - $200 \div 8 = 25$ days
2. Float canister in a bowl of water to determine level of contents (about 200 puffs per canister). **DO NOT DO THIS WITH THE MEDICATION "INTAL".**
 - **Full:** canister sinks or completely submerges, nozzle down
 - **Half-full:** nozzle down in water, flat end above surface
 - **Empty:** canister floats on side of surface of water



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SMALL VOLUME NEBULIZERS (SVN)

- Hand-held, gas powered aerosol generators designed to hold a small volume of liquid medication with a diluting solution.
- Requires a nebulizer and a portable compressor.
- Used for cases when MDI are not suitable.
- Important to follow manufacturer's cleaning instructions.

PROBLEMS ASSOCIATED WITH AEROSOL THERAPY

- Irritation of nose and mouth.
- Voice changes
- Infection from improperly cleaned equipment.
- Poor response to medication if not used properly. Proper technique is very important.
- If using steroid without a spacer, increased risk of thrush (throat infection).

HELPFUL HINTS

- Check your MDIs mouthpiece before each use to make sure it is free from foreign objects.
- Rinse your mouth thoroughly after taking an inhaled steroid.
- **DO NOT** increase dose (either number of puffs or frequency) without your doctor's approval.



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DIAGNOSTIC TESTS

Pulmonary Function Tests evaluate the amount and flow of air that a person is able to breath in and out. A special device called a spirometer is used to measure the flow of air through the lung. You will be asked during the test to perform various breathing maneuvers. You will be given specific instructions by the technician administering the test. Results can suggest lung diseases such as emphysema and chronic bronchitis.

Arterial Blood Gas

- this test is used to determine the levels of carbon dioxide and oxygen in the blood.
- may be done both while in the hospital or as an outpatient to determine lung function and to plan and evaluate treatment.
- a blood sample from an artery (usually from an artery in the wrist or arm) is taken and analyzed.

Pulse Oxymeter

- painless sensor is usually clipped on a finger tip or ear lobe.
- uses light beams to determine hemoglobin oxygen saturation.
- can also determines pulse rate.
- helpful in determining oxygen status and used to help determine adequacy of oxygen therapy.



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Monitoring Peak Flow Rate

- refers to the maximum amount of air that can be exhaled with a forced exhalation
- is a measure of condition of the large airways
- regular home measurement is an important part of asthma treatment since it can pick up problems before symptoms occur
- is important in anticipating acute attacks and identifying worsening of symptoms
- an individual's best "peak flow" rate is the reference point; this personal best is usually determined as the highest peak flow measured in the afternoon during a 2-3 day period when asthma is under control
- regular measurements are compared to personal best
- measurements are compared to three zones established for each person



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ZONES

ZONES	RANGE	INFORMATION
Green	80-100%	All clear; no symptoms present
Yellow	50-80% of personal best	May indicate acute attack or condition is not well controlled; requires re-evaluation of treatment plan
Red	less than 50% of personal best	Inhaled broncodilator should be taken immediately and doctor called if peak flow does not quickly return to and remain in yellow or green zone

MY PERSONAL BEST IS _____

Green Zone (80-100%) _____

Yellow Zone (50-80%) _____

Red Zone (less than 50%) _____



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OXYGEN THERAPY

- cells and tissues require adequate supply of oxygen for survival.
- with COPD, there can be a decreased oxygen available to cells and tissues.
- oxygen therapy is used to increase the oxygen level in the lungs and blood.
- oxygen therapy may be prescribed to be used at home if patients have significantly decreased blood oxygen levels.

Types Of Oxygen Delivery System

- there are three (3) ways that home oxygen therapy may be supplied:
 - compressed gas cylinders
 - liquid oxygen container
 - oxygen concentrator
- your doctor and respiratory therapist will help you decide which type is best for you.
- the most common way oxygen is administered is by using a nasal cannula. This mixes a low flow of oxygen with room air.
- other devices such as oxygen conserving devices or pulsing devices may be ordered if appropriate.

Oxygen Safety Tips

- oxygen is generally safe, but it is important that you follow your doctors instructions precisely; too much oxygen can be harmful to persons with COPD.
- the major hazard with oxygen use is fire and explosion; smoking by anyone must be avoided when oxygen is in use.
- special care must be taken to handle and store oxygen containers properly.



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Safe Ways to Manage Oxygen

1. Always turn off the oxygen unit completely when you're not using it. Keep gas and liquid cylinders away from direct sunlight, which can cause the temperature to rise and the liquid to evaporate.
2. Keep your oxygen unit at least 5 feet away from televisions, radios, and other appliances, space heaters, steam pipes, furnaces, and radiators. If you use a gas stove, don't use oxygen while cooking.
3. Keep matches, cigarettes, candles and other sources of flame at least 10 feet away from any place where you use or store an oxygen unit. Don't smoke, and don't allow others to smoke in your home.
4. Don't place or store liquid oxygen cylinders on their sides. This interferes with the built-in vent, and the liquid inside the tank can evaporate.
5. Don't use vapor rubs, petroleum jelly or any lubricants when using oxygen. They are flammable. Don't oil oxygen equipment, and don't use it with oily or greasy hands.
6. Don't use aerosol sprays, such as air fresheners or hairspray, near oxygen equipment. Aerosols are very flammable.

Traveling with Oxygen

- for short car trips, place oxygen cylinder upright on the floor or on the seat beside you, secured in a seat belt.
- for longer trips, discuss needs with your home care company; factors to be considered include: flow requirements, length of trip, availability of refills, type of vehicle and need for portability of equipment.



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- air travel requires careful planning as FAA regulations prohibit using your own oxygen units. Arrangements need to be made with individual airlines. Supplies for both destination and in-between flights must also be arranged.



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COPD EXERCISE PREPARATION TECHNIQUES

People with pulmonary conditions may experience shortness of breath or have excessive secretions in their lungs. Learning proper breathing techniques and how to clear your lungs of secretions can improve both your everyday functioning and your ability to exercise.

CONTROLLED BREATHING TECHNIQUES

Three techniques which may improve the efficiency of your breathing are:

- pursed lip breathing
- diaphragmatic breathing
- paced breathing

These techniques encourage complete emptying of your lungs and slower, deeper breaths, which improves the efficiency of your breathing.



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PURSED LIP BREATHING can be used just prior to and during activities that have made you short of breath in the past. It is good to use pursed lip breathing when walking on inclines, up stairs and during any exercise or exertion. Pursed lip breathing can also be used during recovery from shortness of breath.

What It Is

A technique to help you exhale more completely because it slows your respiratory rate and helps to keep your airways open longer.

When To Use It

- just prior to and during activities that have made you short of breath in the past.
- while walking on an incline, up stairs and during any exercise or exertion.
- can be used during recovery from shortness of breath.

How To Do It

1. Breathe in slowly through your nose to a count of 2. Relax the muscles of your neck and shoulders as much as possible.
2. Form your lips into a narrow slit, as if you were blowing on hot soup to cool it off. Blow out gently and slowly through this narrow slit to a count of 4.
3. Always blow out longer than you breathe in, so your lungs may empty as much as possible, but do not breathe out forcefully, as this may make breathing more difficult.



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DIAPHRAGMATIC BREATHING decreases the work of breathing by reducing the use of smaller, less efficient muscles of the neck and shoulders.

What It Is

A technique that utilizes the main muscle of inspiration, the diaphragm, while encouraging relaxation of smaller, less efficient respiratory muscles. Using the diaphragm allows more air to move into the lungs with each breath.

When To Use It

- In conjunction with pursed lip breathing.

How To Do It

1. Sit or lie down in a comfortable position, such as on your side, or on your back with your knees bent. Relax the muscles of your neck and shoulders.
1. Place one hand over your breast bone and one hand above your navel. Breathe in through your nose for a count of 2. As you breathe in, your stomach should move out, but the hand on your breastbone should remain still. If you have difficulty isolating the diaphragmatic movement, perform a series of 3 sniffs and your abdomen will rise automatically. Carry this movement into 1 continuous breath.
2. Breathe out slowly through pursed lips to a count of 4. As you blow out, push up and in on your stomach with your lower hand.



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Once you have mastered diaphragmatic breathing in a sitting position, try performing it while standing, and finally while walking.



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PACED BREATHING

What It Is

A technique that involves coordinating your activity with your breathing pattern.

When To Use It

- Paced breathing could be used when walking long distances, up inclines and especially on stairs.
- Use pursed lip and diaphragmatic breathing along with paced breathing.

How To Do It

1. Count while breathing. You should exhale (breathe out) for twice as long as you inhale (breathe in). For example: breathe in for a count of 3, and out for a count of 6.

Example:

Paced breathing works especially well when climbing stairs. Stand still and take a breath in through your nose, and as you blow out through pursed lips, climb up 4-5 steps. When you feel the need to breathe in again, stop and stand still as you inhale. Begin moving up again only when you blow out. Continue this pattern until you reach the top of the stairs.



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RECOVERY FROM SHORTNESS OF BREATH

If an activity leaves you feeling very winded or short of breath, follow these steps:

1. Stop the activity and either sit or stand.
2. Bend forward from the waist and support your arms on your legs or a firm surface.
3. Use pursed lip breathing and diaphragmatic breathing, blowing out twice as long as you breathe in.
4. Breathe initially at whatever speed you need to regain control of your breathing. Slow down gradually.
5. Do not panic. Using these techniques will help you gain confidence in your ability to handle shortness of breath.



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CLEARING THE LUNGS OF SECRETIONS

A cough is the way our bodies clear our lungs of secretions. However, uncontrolled or excessive coughing is very tiring and may produce shortness of breath. Secretion clearance techniques are different methods that move secretions closer to your throat so they can be coughed out more easily. A variety of methods can be used and your physical therapist can help you decide which work best for you.

HOW TO DO SECRETION CLEARANCE TECHNIQUES:

If you take bronchodilator medications, it is important to take them prior to secretion clearance. Bronchodilator medications open the airways and secretion clearance is more likely to be successful.

METHODS:

HUFF COUGHING is one method of secretion clearance. Huff coughing is a modified form of the cough, which used lower pressure changes in the chest to clear secretions.

To perform huff coughing, follow these steps:

1. In the seated position with both feet on the floor, place your folded arms across your upper abdomen.
2. Breathe in through your nose and take a medium sized breath. Hold this breath for a count of 2, without straining.
3. Lean forward and perform 1-2 short, sharp “huffs.” Making a “huff” sound as you breath out helps to ensure that your airways remain open. Push on your abdomen with your folded arms to add extra force to the “huff” cough.



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POSTURAL DRAINAGE is sometimes recommended for people who produce unusually large quantities of secretion. Postural drainage utilizes gravity to help move secretions from outer areas of the lung to larger airways. Once the secretions have reached the larger airways, they can be removed by “huff” coughing. Each segment of the lung uses a different body position to facilitate drainage of secretions. It is important to know which positions will be most beneficial for you. Your physical therapist or doctor can help you learn these positions.

Once secretions have moved to your throat, perform huff coughing to remove them.

Some people also benefit from using the techniques of “percussion” or “vibration” while they are in a postural drainage position.

PERCUSSION AND VIBRATION - **Percussion** involves rhythmically tapping the chest wall in the appropriate area with a cupped hand. **Vibration** is performed only when you are blowing out and it involves performing a rapid, vibratory motion over the chest in the area of the lung being drained of secretions. Both techniques can be performed either by an individual on him/herself, or be done by another person, such as a family member.

ACTIVE CYCLE OF BREATHING is another method of clearing secretions that involves breathing in at two different depths of inspiration.

- First, shallow relaxed breathing is done for 2-3 minutes, emphasizing expansion into the bases of the lung, much like diaphragmatic breathing.
- Next, 4 deeper breaths are performed, expanding the chest in the area of congestion, expanding either the upper chest or the bases of the lung.



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- These two steps are repeated until the secretions are raised to the point where they can be removed by a “huff” cough.
- This technique can be done in any position.

FLUTTER VALVE (SCANDIPHARM) is a device that uses the up and down motion of a steel ball to create a vibratory sensation in the airways as one exhales through it. The flutter device is designed to raise secretions to the level of the larger airways where they can be expectorated by either a spontaneous or flutter-triggered cough. The physician may order instruction in use of the flutter valve for selected patients.

WHEN TO DO SECRETION CLEARANCE TECHNIQUES:

Use these techniques whenever you feel congested or are coughing excessively.

If you feel you may be coming down with a cold, be sure to contact your doctor.



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EXERCISE AND COPD

The importance of exercise for people with COPD has become better appreciated over the years. People who experience shortness of breath or fatigue during exercise or exertion may gradually give up these activities. Soon they find themselves short of breath at lower and lower levels of exertion. The less one does, the less one is able to do. It is very important to remain as active as possible to prevent your muscles from becoming deconditioned.

Exercise can

- improve your ability to perform activities of daily living.
- improve your endurance.
- increase your sense of well being.
- reduce depression.

Before beginning an exercise program, anyone with COPD should consult their primary care physician. Some questions to discuss with your doctor include:

- How should I coordinate my medications with my exercise regimen?
- How high can my heart rate be during exercise?
- (If you are still smoking) What resources are available to help me stop smoking before I begin to exercise?
- Do I need to use oxygen when I exercise?



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SAFE EXERCISE PROGRAMS

All exercise programs should contain three components:

1. **WARM-UP (5 minutes)** - This should include gentle stretching exercises to loosen your muscles and prepare them for exercise. It can also include slow walking.
2. **AEROBIC EXERCISE (this should last as long as the exercise can be comfortably managed; initially it may be only 1 - 2 minutes at a time).** Aerobic exercise is any form of exercise that uses oxygen continuously during its performance. Some examples include:
 - walking (indoors or outdoors)
 - treadmill walking
 - stationary cycling
 - swimming
 - video workouts
 - stair climbing/stepping machines
 - rowing machines
3. **COOL DOWN/STRETCHING (5 minutes)** It is important not to stop exercise abruptly, as this may cause lightheadedness. To cool down, you should walk slowly, and repeat some of the gentle stretching exercises you did during the warm-up. Performing a cool-down session allows your heart and lungs to gradually return to normal.



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KEY POINTS

- Pick aerobic exercises that you enjoy and exercises that address the areas that are limiting your ability to be more active in your daily living. For example, if walking is difficult for you, choose an exercise program that works on walking or strengthening the muscles in your legs.
- Don't worry about speed, start slowly and move in a relaxed manner as you exercise. Try to gradually increase the length of time you exercise from 1-2 minutes to 2-3 minutes, then 5-6 minutes, if possible. Some people may be able to progress to 20-30 minutes of continuous exercise, but for those who cannot, it is now believed that even shorter exercise sessions of 5 minutes or more are beneficial to your health. If you exercise for less than 20 minutes at a time, try to repeat the shorter exercise session following a rest period, one or possibly two more times.

REMEMBER: Short exercise sessions are better than none at all!

- How often you exercise depends on how long each session lasts. If you can exercise for 20-30 minutes at a time, exercising 3-4 times a week is good. This will allow a day of rest between exercise sessions. If you exercise for 15 minutes or less, these shorter exercise sessions can be repeated 5 days a week.

INTENSITY OF EXERCISE

Monitoring your heart rate by taking your pulse is the most common measure of intensity. To take your pulse, place your index and third finger on your wrist at the point where your wrist and thumb meet. Count the number of pulses in 15 seconds and multiply this number X 4 to obtain your heart rate per minute. Your heart rate should stay below the maximum heart rate number given to you by your physician when you exercise.



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Another method for estimating the intensity of your exercise, is to think about your breathing effort. It is good to continue exercising if you are just mildly short of breath, but do not exercise to the point where you become severely short of breath. You still should be able to speak and carry on a short conversation if you are exercising at an appropriate intensity.

GUIDELINES FOR STOPPING EXERCISE

Exercise is something that should be increased gradually, and at first should be done at a slow speed so your body can gradually adjust to the new workload. If you experience any of the following symptoms, you may be exercising too hard and you should stop exercising.

- Exceeding heart rate limit given by your physician
- Excessive breathlessness
- Dizziness/lightheadedness
- Extreme fatigue
- Leg or foot cramping
- Anxiety or increasing worry about the level of breathlessness being experienced.

AEROBIC RECREATIONAL ACTIVITIES

Some recreational activities use oxygen continuously during their performance and may also be considered forms of exercise. Recreational exercise could include such things as dancing (all types) or playing games such as Ping-Pong, darts, shuffleboard or horse shoe toss.



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GENERAL PRECAUTIONS FOR EXERCISE

Eating - Do not exercise just after a heavy meal. Do not exercise without having eaten something during the day. A light snack, including fluids, about 30 minutes before exercise is recommended.

Weather Conditions - Exercise indoors on windy or cold days, and excessively hot and humid days.

Altitude - Do not exercise at high altitudes. Breathing will be more difficult at high altitudes due to the decreased oxygen content of the air.

Pollution - Do not exercise in areas where car exhaust fumes are concentrated or when the air quality is rated as "poor."

Clothing - Dress appropriately for the weather. Wear good foot supporting shoes with shock absorption for walking programs.

TIPS FOR STICKING WITH AN EXERCISE PROGRAM

1. Make exercise fun by choosing activities that you enjoy and vary your routine.
2. Exercise with a friend.
3. Include exercise in every day activities by walking to nearby errands or taking the stairs one flight instead of the elevator.
4. Include household chores with repetitive arm movements as forms of exercise. Some examples include vacuuming or washing windows.
5. Be realistic about your exercise goals and expectations. Increase your exercise gradually so you can feel a sense of accomplishment about your level of activity and your exercise program.



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WEIGHT TRAINING

Recently the importance of adding weight training to the exercise program of people with lung conditions has become better appreciated. Increases in arm strength may improve the performance of activities of daily living. Weight training can also improve the contours of your body and improve your physical appearance.

GUIDELINES FOR WEIGHT TRAINING IN COPD

1. Generally people with COPD should exercise with only one arm at a time, using a light weight of 1-2 pounds.
2. Coordinate breathing with the movement -- breathe in as you lift the arm, and breathe out as you lower the arm. Never **hold** your breath while lifting or lowering weights.
3. Start with a low number of repetitions, 3-5, for a single movement.
4. Alternate arms during exercise. Do **not** do all exercise on one arm before repeating on the other arm.
5. Maintain good posture as you perform weight training, so your lungs may function properly.
6. Allow 48 hours between weight lifting sessions.



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TRIGGERS THAT MAY IRRITATE YOUR AIRWAYS

The following are common triggers that may aggravate breathing problems. You should identify your personal triggers and plan ways to avoid or minimize them.

Check off your triggers:

smoke

dust

pollen

cold air

pets

fumes

aerosol sprays



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LIFESTYLE ADJUSTMENTS

- **DO NOT SMOKE.** Stay out of areas where you may get second-hand smoke.
- Take medications as prescribed.
- Avoid excessive emotional tension.
- Control episodes of breathlessness through techniques of relaxation, breathing, and controlled coughing.
- Build your strength and endurance with a daily walking and exercise program (consult with your doctor before you begin).
- Avoid pets if they are triggers.
- Avoid air pollution from traffic jams, parking garages, dusty work areas and smoke-filled rooms.
- Avoid strong chemicals and aerosol sprays.
- During times of heavy smog, listen to radio or TV news for air pollution alerts and adjust your outdoor activity accordingly.
- Cover your nose and mouth with a warm scarf (or your hand) during cold weather to warm the air you breathe.
- Wear a mask or handkerchief over your mouth and nose when doing tasks such as dusting, sweeping, vacuuming or yard work.
- Avoid infections:
 - Ask your doctor about flu and pneumonia vaccinations
 - Keep your body healthy with daily exercise, nourishing foods, and enough sleep so you can fight germs that cause infection.
 - Keep your lungs as clear of mucus as you can. Drink a lot (2-3 quarts) of water or fluids to keep phlegm (sputum) loose.
 - Avoid crowds of people, especially those with colds or flu.
 - Wash hands often, and keep your nose, throat and teeth clean.



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ENERGY CONSERVATION TECHNIQUES

Energy conservation techniques are methods for performing activities which will conserve personal energy. These methods change or lessen the energy requirements of an activity, in order to conserve the energy. When using these methods during an activity, it may be possible to complete the activity without, or with a lesser degree of shortness of breath.

GENERAL GUIDELINES

Key Points

- Space tasks throughout the day. Monitor how you feel throughout the day.
- Take 20-30 minute rest breaks after meals and throughout the day. Take rest periods before you are exhausted.
- Perform strenuous activities when you feel you have the most energy.

Pacing and Balancing Your Day

- Monitor how you feel throughout the day
- Take rest periods before you are exhausted
- Alternate light and strenuous activities throughout the day and the week

Work Simplification (involves simplifying the methods of an activity)

- Plan ahead and prepare before starting an activity
- Gather all necessary items before you begin
- Eliminate unnecessary steps of an activity
- Organize the activity area so that all items are within an easy reach; keep things you use most at waist level
- Use assistive devices such as electric can openers, appliances, power tools, lightweight pots and pans



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Body Mechanics and Movements

- Maintain a straight back posture whenever possible
- Use large muscles (leg muscles) when lifting or pushing objects
- Never rush
- Use slow, fluid movements; keep your arms close to your body
- Sit to dress, undress, shave, brush your teeth and comb your hair
- Use a cart with wheels to move household items

Breathing Patterns

- Use breathing patterns before, during and after activities



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DIET AND NUTRITION

Your diet can affect your breathing and energy level. It is important to consume a well-balanced diet with adequate calories and protein to maintain a healthy weight and plenty of fluid to keep mucus thin.

Maintain a Healthy Body Weight

Being overweight can increase shortness of breath. Being underweight can cause a decrease in energy level and make you less resistant to infection.

Eating a balanced diet helps to maintain a healthy body weight. This includes meat and dairy products, fruits and vegetables, and breads and cereals.

If shortness of breath during or after meals is interfering with adequate food consumption, the following is suggested:

Small frequent meals rather than three large ones will help to keep your stomach less full and give your lungs more room to expand.

Avoid gas producing food such as broccoli, cabbage, cauliflower, brussel sprouts, green peppers, legumes and chewing gum.

Excess gas from foods can cause your stomach to swell and press on your diaphragm.

Avoid swallowing excess air by chewing slowly with your mouth closed and avoid using straws when drinking.

Drink Plenty of Fluids

Drinking plenty of fluids will help keep mucus thin, making it easier to cough up.

Drink fruit juices, water, mineral water and decaffeinated beverages.



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Avoid caffeinated tea, coffee, colas, sugar sweetened beverages and alcohol as they may cause dehydration.



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WHEN TO CALL YOUR DOCTOR

Call your doctor if you notice any of the following possible “danger signs” occur:

- increased symptoms such as increased shortness of breath or coughing
- change in color of sputum to yellow or green
- bloody sputum
- fever
- increased secretions
- lightheadedness or dizziness
- blue finger and toe nail beds
- sweating
- unable to do usual activity because of shortness of breath
- chest pain
- any symptom that is worrisome to you
- any other unusual symptoms



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LIVING WITH CHRONIC ILLNESS

Chronic illness can be one of life's most difficult challenges. It may create ongoing stress for you and your family and can affect many aspects of your life.

There are different ways that you may cope with a chronic illness because each of us is unique and individual. Stresses vary throughout the course of illness, as you may find that you cope differently at different points in your illness. You may feel like you are on a roller coaster, sometimes up, sometimes down, other times flat. You may become aware of many emotional responses such as worry, anxiety, and anger. All of these are normal and experienced by many people. You need to know you are not alone.

It is especially important for you and your family members to talk about how each of you feels about the illness. Often it is helpful to discuss your expectations; changes in what you will be able to do and what help you can ask from your family. Requesting reassurance and emotional support from concerned family, friends, and medical staff members can be an important source of strength in facing difficult times.

Once you know your diagnosis, try and obtain as much information about your condition and how your doctor will manage your treatment. This will help you to communicate with your doctors and health care team more effectively. You will be better prepared to understand treatments that are recommended. Awareness and understanding of your condition can lessen anxiety and uncertainty, improving your ability to cope.



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When you are in the hospital, you can ask to speak with a social worker. As a member of the health care team, the social worker can help you and your family deal with the emotional stress and problems related to illness and hospitalization by helping you to better understand your situation, clarify and identify problems and help you to mobilize your supports. There are a number of resources in the community. The social worker can provide you and your family with information on support/self-help groups, and organizations that can provide you with factual help and guidance.

HELPFUL HINTS

- learn all you can (seek out information pertaining to the diagnosis)
- identify sources of support (how can family and friends help?)
- inform people what is happening (good communication is vital in maintaining some stability through the roller coaster ride of chronic illness)
- examine your life-style as this may have an effect on treatment, course or reoccurrence of the illness. Good health practices will contribute to reducing stress and facilitating adaptation.

In summary, good coping techniques can help you successfully manage the emotional and social impact of your illness.



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RESOURCE ORGANIZATIONS

American Lung Association
1740 Broadway
New York, NY 10019
1-800-LUNGUSA (800-586-4872)
Web address: www.lungusa.org

National Allergy and Asthma Network
Mothers of Asthmatics, Inc.
3554 Chain Bridge Road Suite 200
Fairfax, VA 22030
800 878-4403

Emphysema Anonymous
P.O. Box 3224
Seminol, FL 34642
813 391-9977

Asthma and Allergy Foundation of America
1125 15th Street, NW #502
Washington, DC 20005
202 466-7643 - or - 1-800 727-8462
Web address: www.aafa.org

National Jewish Medical and Research Center
1400 Jackson Street
Denver, CO 80206



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800 222-LUNG (800-222-5864) or 800 552-LUNG (Lung Facts)

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