

MEDICATIONS



You are probably taking some type of medicine for your lung condition. It is very important for you to understand what the medicine does, how to take it, how much or how little to take, and the possible side effects. If you don't take your medication or are inconsistent in taking it out of fear, distrust, or simple forgetfulness, you will not do as well.

Of course, only generalizations regarding medications can be made here. Ask your doctor and pharmacist for specific details about your own medication(s).

Drugs generally have two or more names: a generic (chemical) name and a brand (company) name. There is only one generic name; but, the same drug may be manufactured by many different companies, each giving the drug a brand name of the company's own devising. A certain medication has a specific chemical composition; but, several drug companies may manufacture it. Each company gives this drug a brand name. A similar situation exists among foods and household cleaners. Ordinary bleach, for example, may be called Clorox or Purex or whatever.

Your pharmacist may ask if you would care to substitute a brand name medication for the generic substitute. This is usually to your benefit because it can save you money; however, be certain you check with your physician before using generic substitutes. The reason for this is that if you have been taking a prescribed brand drug and your pharmacist changes to the generic drug, it is possible you

could become ill or not do quite as well. Although this is not likely to occur, an upset from the generic drug or various brand drugs could occur.

Identical medications may vary in potency, purity and quality in spite of such regulatory agencies like the FDA (Food & Drug Administration). Generic and brand drugs, although claiming to be identical in strength, etc., may contain various adjuncts (additives). These are used to improve the overall activity of the medication. One might increase or decrease the rate of absorption from the intestinal tract into the bloodstream, its rate of spread into the tissues, or some other action. Buffers are adjuncts to aspirin which increase the rate of absorption into the bloodstream. Some adjuncts are inactive. Types of adjuncts used in making medications are: binders, buffers, colors, diluents, emulsifiers, flavors, lubricants, preservatives, and stabilizers.

If you use a fair number of medications, it is good to keep a record of how you feel, whether good or bad, so that your doctor can see that you are being treated with the proper drugs. Another important thing to remember is the names of your medications. If you suddenly developed a rash, changed doctors, went on a trip or had to go to the emergency room, both you and the doctor would need to know exactly what medications you are currently taking. It is a very good idea to make a list of your medications and carry it with you or carry a sample of the medications you are currently taking.

A general consideration to be thought of while taking medications, especially a new medication, is your age. With age the liver steadily decreases in size; and, there is also a reduction in the amount of blood circulating through the kidneys. Many drugs are disposed of by these organs; and, if these systems do not properly eliminate residual drugs, you may experience increased side effects. It is advised to take your medications as prescribed by the doctor; however, it would be wise to confirm with him that the dosage is appropriate for your age.

Another consideration to be taken when using medications is dosage. If you miss a dose and remember within an hour or so of the missed dose, take it right away. But, if you do not remember until much later, do not take the missed dose and do not double the next one. Instead, go back to your regular dosing schedule.

It would be impossible to list all the drugs and their side effects. Ask your pharmacist for the manufacturer's literature on any particular drug you are taking, look it up in the Physician's Desk Reference (PDR) at your library, or ask your doctor or pharmacist.

Help The Medicine Go Down

It is sometimes quite difficult to swallow pills. The size and shape of many pills may cause them to get caught in the esophagus or at least irritate it while the pills are going down. To help eliminate this problem, take some banana and chew it well. The fruit sweeps the esophagus clean as it descends into the stomach.

Record Of Medications

You may be taking a number of medications for your lung condition; and, if so, it can be quite confusing to remember whether you took the medication or not or when to take the medication. Many physicians and pharmacists advise their patients to record all medications when taken regularly.

A record of medications will be helpful to prevent confusion when taking quite a number of medications. See the following directions and example for making your own record of medications.

Record of Medications Directions

It is conservatively estimated that more than 70 percent of patients who take prescribed medications do not take their medication properly. People forget if they took the drug or not, took it on time, took an extra pill or completely forgot the medication.

You may find this record keeping time consuming in the beginning; but, it will simplify your life in the long run.

* Draw vertical lines according to the following sample on a notebook or legal pad, etc.

* Record name, dose, time and frequency drug is to be taken and purpose of medication. Do this with each medication.

* Check before taking a dose to make sure you have not already taken the medication. Get into the habit of checking (√) the proper square immediately after taking the medication.

* Understand the use of all your medications before leaving the doctor's office in order to complete the record of medications properly. Write it down or take the chart with you.

* Here are some commonly used abbreviations used in writing prescriptions:

a.c. - before meals

qtts - drops

Mg. or mgm - milligram

qd - every day

q 6 h - every 6 hours

qid - four times a day

qod - every other day

PRN - when required

bid - twice daily

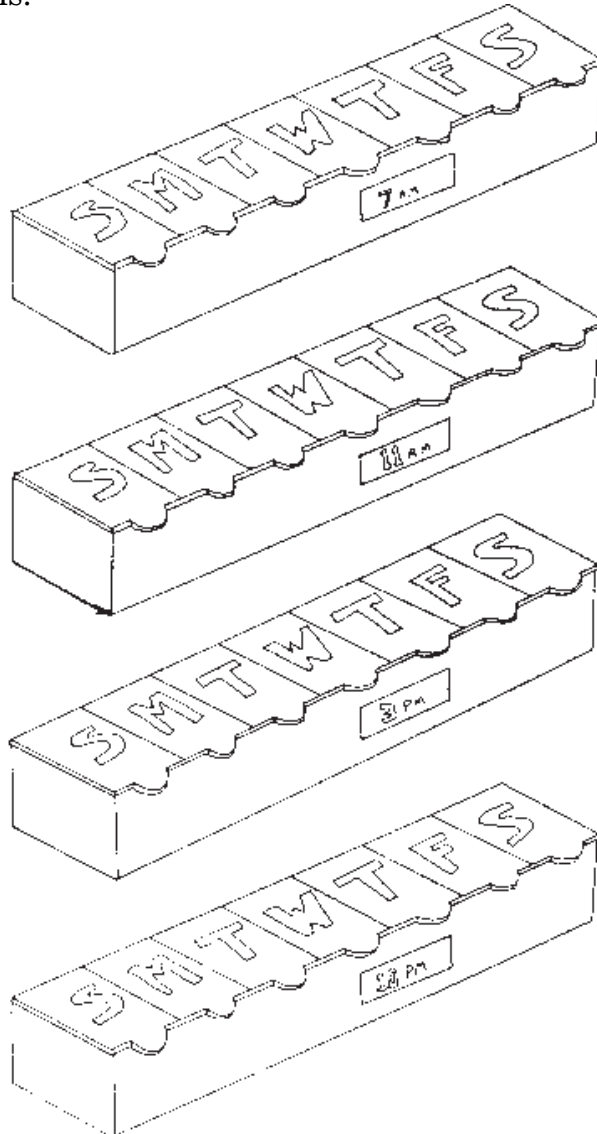
q.a.m.-every morning

tid - three times a day

P.O. - by mouth

* Be consistent. Use your record regularly and feel confident that you are taking your medications properly.

Another suggestion for properly taking your medications is to purchase plastic containers specifically designed to keep your medications straight. One type is divided into seven days and comes in four different colors. (There is also a container for all seven days of the week.) You can organize your medications for the week by simply labeling the dispenser(s) for the appropriate times. See the following illustrations.



Bronchodilators

These drugs affect the muscles that form the bronchial tubes causing the airways to relax and widen in order to relieve restricted breathing. Bronchodilators help if you are short of breath or are wheezing; they assist in maintaining open airways.

Thus far, no study with large numbers of people have found one bronchodilator to be the best or one particular device for taking the bronchodilator to be the best. The point being made is that improvement can be demonstrated by all forms of bronchodilator therapy provided the patient uses the bronchodilating medications according to instruction.

Some of the bronchodilators used are *theophylline* or *aminophylline* which are available in many tablets and capsules and many trade names, e.g. *Somophylline*, *Constant T*, *Theodur*, *Bronkodyl*, *Theolair*, *Uniphyl*. . . . These preparations come in short acting or long acting products making it convenient for the patient. The newest form of some of the *theophylline* bronchodilator tablets is in a controlled, longer lasting, release tablet. This form of *theophylline* is usually taken once a day in the morning by most patients.

Blood samples are used to check the amount of *theophylline* in the blood stream. Your doctor can find out whether there is enough theophylline in your body. There is a therapeutic serum level which may vary from patient to patient. See page 141 for more information.

Other forms of bronchodilators may be taken in aerosol form, metered-dose inhaler, capsules or tablets: *metaproterenol* (*Alupent*) comes in all three forms; *isotherine* (*Bronkosol*) comes in liquid for aerosolization and in the metered-dose inhaler; *terbutaline* (*Brethine*, *Bicanyl*) comes in tablets and the metered-dose inhaler (*Brethaire*); *albuterol* (*Ventolin*, *Proventil*) also comes in all three forms - tablets, metered-dose inhaler and liquid for aerosolization; *bitolterol mesylate* (*Tornalate*) comes in the metered-dose inhaler.

The drug *ipratropium bromide* (*Atrovent*) which is available in the metered dose inhaler appears to have significant relief for patients with COPD. One of its disadvantages, however, is that its peak bronchodilator activity does not occur until approximately 60 minutes after inhalation; therefore, it is not indicated for the initial treatment of an acute bronchospasm. When *Atrovent* is used with other bronchodilators, it acts primarily on larger airways while other bronchodilators, such as *Metaprel*, work predominately on the smaller airways. Dry mouth and bad taste in the mouth have been noted by some patients; however, there is no significant side affect.

As mentioned, many of the above bronchodilators may be taken in aerosol form. A prescribed amount of the medication is dropped into the reservoir of the nebulizer. This usually amounts to 1/4, 1/3, or 1/2 ml of a bronchodilator in 3 cc of a normal saline solution. It can be awkward to put the exact amount of medication into the resevoir. If it is difficult for you, ask your physician to prescribe premeasured unit doses which Medicare and many insurance companies presently approve.

Bronchodilating preparations, especially in capsule or pill form, may cause upset stomach and heartburn; and, any of these drugs may cause nervousness, heart palpitations and increased heart rates. Many of these symptoms usually subside; however, if they continue or increase, check with your physician.

Alcohol, smoking and coffee may interfere with many bronchodilating drugs. Your doctor should be aware of your habits in order to make any adjustments in your medications.

Antibiotics

These medications are used to fight and sometimes to prevent bacterial infections. Some generic names for antibiotics are *penicillin*, *sulfa drugs*, *erythromycin*, *tetracycline*,

cephalosporin, and *oxyquinolone* which are effective against all organisms except for the most exotic. Sometimes it is necessary for your doctor to order a sputum culture test done in the laboratory; however, under most circumstances your physician will prescribe routine antibiotic therapy without a sputum culture. It has long been advised for COPD patients to initiate antibiotic therapy at the first sign of infection. In addition, many physicians prescribe with regularity antibiotics for preventive medicine. Like all drugs, you should take these drugs as prescribed and usually for 7 to 10 days. If you stop taking the drug before the prescription has run out, or if you skip doses during the time you are supposed to be taking them, you can actually make the infection last longer or become worse.

Some antibiotics, such as the *tetracyclines*, are absorbed better if the stomach is empty. Thus, if they are taken with meals, or even between meals with milk or antacids, absorption will be greatly decreased. *Doxycycline*, which is a synthetic derivative of *tetracycline*, may be taken with food including milk or carbonated beverages; however, it should not be taken with an antacid. *Erythromycin*, on the other hand, should be taken with food since it may cause gastric irritation. *Penicillin* or *sulfa drugs* may also be taken with food. If you are uncertain when to take an antibiotic, always check with your doctor or pharmacist. There are two new antibiotics, *Ciprofloxacin* and *Norosin*, belonging to the newest family of antibiotics, *oxyquinolone*. This is the broadest spectrum of antibiotics which enables your physician to now prescribe medications which can fight against major infections in your lower respiratory system.

Antibiotics can also have side effects. Some people are allergic to certain types of antibiotics and develop a rash, swelling or itching, and may become sensitive to sunlight. Others suffer with diarrhea, stomachache or sore mouth and tongue. Call your doctor for advice if you experience any of these side effects.

Expectorants

Water is believed to be the best expectorant. Unfortunately not enough attention has been given to water although it is the best for helping the lungs to get proper hydration. If you are not restricting your fluids under doctor's orders, 8 to 10 **extra** glasses of water per day - not including your regular liquids is not too much.

Some expectorants contain antihistamines which cause dehydration and *codeine* which suppresses the cough. If your doctor prescribes this type of expectorant, take it sparingly and under his direction only. You want to get the mucus out - not cause it to thicken. You do not want to completely suppress the cough since coughing is the mechanism for bringing up the mucus.

Potassium iodine and *glycerol guaiacolate* (generic names), act by liquifying the secretions so that it is less viscous and can be more easily expectorated. Iodine preparations have a 20% side effect rate which is why it is not prescribed frequently.

Antihistamines

Antihistamines (*Actifed*, *Allerest*, *Benadryl*, *Coriciden*, *Dimetane*, *Seldane*) are very effective to relieve or prevent symptoms of hay fever and other types of allergy. In addition, some of these medications are also used to prevent motion sickness, nausea, vomiting, and dizziness. Antihistamines may thicken bronchial secretions; therefore, they should be taken only under doctor's orders especially if you have congestion or infection in the lower respiratory tract. Antihistamines may also cause drowsiness.

Decongestants

Decongestants (*Congespirin, Dimetapp, Tussar-2, etc.*) act on the capillaries which line both the nasal area and the bronchial tubes. When these capillaries are filled with maximal blood flow, they are congested. The congestion causes increased swelling thereby obstructing air flow into the lungs. Decongestants work well for congestion in the upper respiratory tract but may cause drying and thickening of secretions in the lower respiratory tract making it very difficult for a person to clear the lower airways. They should be taken only under doctor's orders.

Steroids

Steroids are related to corticosteroids called *cortisone*. (You may know it by the brand name *Prednisone*.) Steroids are used to decrease acute and chronic inflammation and swelling of the respiratory tree, therefore, dilating the bronchial tubes. The specific anti-inflammatory action of these drugs affecting the bronchial tubes is unknown; however, it appears that bronchodilators often work better after steroid therapy is used.

Steroids have many metabolic and physiologic side effects which usually are correlated to the amount you take. Infection may be masked, enhanced or activated by steroids. A person using these may develop an infection and not know it since the medication may suppress the fever which is usually symptomatic. An increase in appetite, weight gain and "puffiness" are reported by most patients using steroids.

Steroids may worsen some chronic diseases such as diabetes, glaucoma, and high blood pressure. Many physicians recommend that you see your eye doctor twice a year

for early detection or treatment of glaucoma and/or cataracts. In addition, steroids may cause increased gastric acidity, speed up the formation of cataracts, and weaken the bones. This bone complication (known as osteoporosis) is more common in women than in men. The bones may become less dense allowing them to fracture easily as in the hip of the leg bones, or the bones of the spine may compress causing chronic back pain. Bone complications can be kept to a minimum if you exercise adequately, drink a quart of skim milk daily and take calcium supplements.

Osteoporosis is not only caused by steroid therapy. It is a chronic condition which is not totally understood; however, it is known that steroids aggravate this condition and proper consultation by your physician is necessary while taking steroids. It is very important that you take this medication only as directed and never stop this medication abruptly.

Beclomethasone (Beclovent, Vanceril) and triamcinolone (Azmacort) are aerosolized steroids for topical use in the respiratory tree. Evidence indicates that little of the steroid is absorbed systemically when used properly thus eliminating the side effects of steroids. These steroids are not to be used in place of other steroids; however, in some cases, it is possible for you to take a smaller amount of oral steroids or perhaps to take no other steroids when using the inhaled type. This is called “weaning” the patient down or off steroids and should be done carefully under a doctor’s supervision. These inhaled steroids should not be used in place of a bronchodilator and are never to be used during a bronchospasm.

It usually takes between 2 to 8 weeks before one notices the effectiveness of these inhaled steroids. To use them properly one should first use a bronchodilator according to direction, wait for dilation of the bronchial tubes to occur (10 to 20 minutes), and then administer 2 puffs of whichever steroid is prescribed at one minute intervals between each inhalation. Always rinse your mouth thoroughly after use.

Cromolyn sodium

Intal is a brand name for *cromolyn sodium* and is usually taken via an inhaler. It helps to prevent asthmatic attacks in particular individuals, especially young people.

An asthmatic attack occurs when particular cells in the bronchial tree are irritated by certain mediators. Histamines are a type of mediator produced by the body which, when released, cause constriction of the bronchial tubes. *Intal* helps to prevent the release of histamines and other mediators before an attack begins. *Intal* should not be confused with bronchodilators, anti-histamines, or steroids which have been described earlier in the chapter.

If your doctor prescribes an *Intal* inhaler, it is absolutely imperative that you follow his instructions carefully. During your trial period, usually two to four weeks, you must use *Intal* regularly and record any asthmatic attack, sneezing, coughing, etc. At the end of this period, your doctor will evaluate how effective *Intal* works for you.

Remember, to get the full benefit from *Intal*, you must use it regularly according to your doctor's prescription. The usual starting dose is two metered sprays inhaled four times daily at regular intervals. *Cromolyn* may also be taken in aerosol form with a bronchodilator.

Diuretics

Diuretics are used to eliminate excess body fluid (edema). Edema or swelling can show up most anywhere in the body and it can be felt in the joints of the body. Sometimes avoiding foods high in sodium will reduce edema; but, your doctor will make that decision. Diuretics may cause a loss of potassium from the body. To help prevent this, your doctor may want you to eat or drink foods high in potassium (citrus, other fruits - especially bananas) or to take a potassium

supplement. A doctor's prescription and advice is necessary.

Potassium Supplements

Potassium is given when you do not have enough potassium in your diet, have lost too much potassium because of illness, or have taken or are using certain medicines such as "water pills." This potassium loss may cause weakness and heaviness of the legs, listlessness, fall in blood pressure, and cardiac arrhythmias. *Potassium* supplements or foods high in potassium can counteract the side effects of potassium loss.

Digitalis

Digitalis improves the strength and efficiency of the heart. It may also control the rate of the heart beat. This increase in strength allows the heart to better circulate the blood which helps to reduce swelling of hands and ankles for those who have this problem. *Digitalis* is available only by prescription.

Tranquilizers & Sedatives

Tranquilizers and sedatives are for temporary relief of anxiety, tension and sleeplessness. These drugs are very dangerous if overused since they depress breathing. Also, overuse of these drugs may be counter productive since this may intensify nervousness and anxiety, whereas, the proper amount relieves these symptoms. If you are taking these drugs the effects of alcohol and other central nervous system depressants may very well be increased.

Flu & Pneumonia Vaccines

Flu and pneumonia vaccines are available at your doctor's office and most clinics. It is advisable to be vaccinated 6 to 8 weeks prior to flu season since it takes this time for your body to build up a resistance to these "germs." To help prevent a reaction from the vaccine, it is advisable to take the injection in the late afternoon. You should rest at your doctor's office approximately 20 minutes after the injection before going home. This helps to minimize adverse reactions to the vaccines. These vaccines should not be given in the presence of any febrile, respiratory illness or other active infection.

If you cannot take the flu vaccine because of an allergy or fail to take the injection in time and get the flu, there is still a medication which can lessen the symptoms. *Amantadine* should be started immediately after the symptoms have begun and then be continued for 7 days.

New Medications

There are several new medications which are currently being used in Europe and Canada that are going to be made available in the United States. *Fenoterol* (*Berotec*) which is closely related to *Metaprel* has been available in Europe for more than ten years; and, a great amount of information has been gathered. *Fenoterol* has been shown to work more quickly, last longer and have minimal side effects. Another drug, *ketotifen* (*Zaditem*) will be the first drug to help prevent asthma attacks that may be taken orally on a twice-a-day schedule. Currently, *cromolyn sodium* is used to help prevent attacks; however, it is not as easily used and must be taken more often. Like *cromolyn sodium*, the exact mechanism of action of *ketotifen* is unknown; and, the only major side effect appears to be sedation, which does not even occur regularly.

Oxygen

Oxygen is a drug which must be prescribed by your doctor. It may be recommended to use supplemental *oxygen* continuously, while sleeping or during exercise. To determine if supplemental *oxygen* is needed, an arterial blood gas test is taken to check the amount of oxygen and other factors such as carbon dioxide (CO_2) in arterial blood. Too low a level of oxygen in the blood, referred to as hypoxia, can cause malfunctions of the entire body and leave you feeling anxious, depressed and weak.

For many with COPD there is an extra burden on the right side of the heart. This side of the heart quite often must pump with more force in order to push the blood through the lungs so as to pick up oxygen. Administration of *oxygen* can ease the burden on the heart and can help control extra blood formation which occurs to compensate for the decreased amount of oxygen in the blood.

Oxygen therapy is nothing to be frightened of and, like other drugs, should be used as prescribed. If you took too much *oxygen* without the direction and knowledge of your doctor or other properly informed professionals, it could do more harm than good.

Properly functioning lungs respond to the sensitive respiratory center at the base of the brain which stimulates it according to increases in carbon dioxide (CO_2) and decreases of oxygen (O_2) in the blood.

In more advanced COPD, the center at the base of the brain is no longer functioning properly. There are, however, O_2 chemoreceptors in certain blood vessels of the chest and neck which stimulate your breathing because of lower levels of O_2 . This low level of O_2 may be your only stimulus to breathe. If you should turn up your flow meter thinking it will help you to breathe easier, it could actually cause you to breathe less because the O_2 chemoreceptors are “satisfied” with the amount of O_2 passing by them in the blood. The chemoreceptors say, “Slow down the breathing rate.” Unfortunately, improper use of *oxygen* has caused some tragedies permitting the respiratory system to cease functioning.

Oxygen Systems

If your physician has prescribed *oxygen*, you will be quite amazed and pleased to learn of the versified systems available. You will learn that *oxygen* is safe. It is not addicting; and, it will make breathing easier when used as prescribed.

The newest system of oxygen on the market is the oxygen concentrator. This supplemental oxygen source draws room air in through a filter by an electrically powered fan. The oxygen passes through a membrane filtering system and out to a flow meter which you can regulate. Nitrogen is vented out into the air. This system is extremely safe and works off of any standard 110-



115 volt electric outlet. For short trips, if you need continuous *oxygen*, you will need small cylinders as described further. In addition, a small cylinder may be used as a back up oxygen tank if you live in an area where electrical failure is common. For longer trips you may take it with you as baggage.

You may even have your car's electrical system modified so you can use it while traveling. It may be used anywhere you have standard electric outlets.

Oxygen can also be compressed in cylinders. For moderate or continuous use of oxygen, one could use large "H" size cylinders. You would control the amount of oxygen with a flow meter attached to a pressure regulator on the



cylinder. The flow rate is determined in liters per minute (l/m) and will be prescribed by your doctor.

Smaller “D” and “E” size cylinders may be used for portable oxygen. An aluminum size “E” tank is most commonly used. It weighs approximately 13 pounds and will run up to 5 hours at 2 l/m. The smaller “D” tank will supply approximately 3 hours at 2 l/m.

And finally, *oxygen* is available in a liquid system. Very cold, liquid oxygen is compressed in a thermos like container which can be refilled easily by an oxygen equipment company. A portable walker unit can also be filled from the main O₂ source. This gives you freedom to leave you home for up to eight hours at one to two l/m. The liquid reservoir which refills the portable unit contains a 4 to 7 day supply of *oxygen*, depending upon oxygen usage. Caution: Do not touch the steam which slowly escapes this system for it is extremely cold and may burn you.



Note: A humidifier (bubble jar) is often connected to the flow meter on any type of *oxygen* used continuously. Oxygen is a dry gas; therefore, you may want additional humidity so that the delicate tissues lining the nose do not become irritated. Recent studies, however, indicate that with liter flows of less than 3 l/m of *oxygen*, supplemental humidity is not necessary. It is felt by these researchers that the person inhales along with the supplemental *oxygen* a sufficient amount of ambient air which contains humidity.

Making Oxygen Last Longer

The portable unit of liquid *oxygen* system is very handy if you are a person always on the go. However, liquid

systems are quite expensive. Two new devices on the market will help conserve *oxygen* allowing you to use the less expensive portable oxygen tanks or allow your liquid system to last longer.

The Oxymizer Pendent will allow you to take less *oxygen* from the tank to get the same amount of oxygen into your body. The manufacturers say you can use as much as 75% less *oxygen*, depending on the flow rate, than if you were using a standard nasal cannula.

The Oxymatic electronic oxygen conserver allows *oxygen* to be delivered at the instant inhalation begins. No oxygen is wasted during exhalation. There are four settings on the Oxymatic which makes it possible to deliver only a very small amount of *oxygen* to achieve the desired liter flow. At the opportune moment, it very quickly delivers a measured pulse of *oxygen* so that it is part of the first air taken into the lungs as inhalation begins.

Both units, the Oxymizer Pendent and the Oxymatic may be used with oxygen tanks or with most portable liquid units. Check with your home care company for more information.

Since the concept of oxygen conservation has become so popular in recent years because of the substantial economic cost that *oxygen* therapy adds to health care, transtracheal oxygen therapy has been introduced as the newest mode of delivering continuous *oxygen* directly into the lower airways via a small catheter inserted into the trachea (the windpipe) at the base of the neck. This form of *oxygen* therapy, however, is still considered by the American Thoracic Society to be in experimental stages. While it does allow the patient who requires continuous *oxygen* to be free from wearing a nasal cannula, there is still a degree of risk for those who choose to undergo this form of *oxygen* therapy.

Oxygen Safety

You should know how to use your *oxygen* safely. The room should be ventilated and the O₂ source away from heating pipes, heat radiators and at least 10 feet from open flames or electrical sparks - this includes electric shavers and persons smoking. Also, never change regulators on oxygen tanks with a greasy or oily wrench. Friction could cause a spark creating a potential flash fire. Remember, oxygen supports combustion, that is, oxygen will not burn but will allow other things to burn more intensely.

Oxygen in tanks is under a great amount of pressure, between 1800-2400 psi (pounds per square inch) when filled. If a tank is not properly secured and should topple over, it could take off like a rocket. Also, remember to contact your oxygen equipment company before the pressure regulator on the tank reads 500 psi. This prevents the possibility of running out of *oxygen* in the middle of the night or on a weekend. Use your head when using *oxygen*. Remember not to turn your *oxygen* higher than prescribed merely because you feel short of breath. If you have been exercising or are perhaps stressed in some way, additional *oxygen* will not necessarily help you. The only safe method for detecting the amount of oxygen you need is a blood test. An arterial blood gas test should always be performed before home *oxygen* is prescribed and rechecked routinely so your doctor can prescribe proper therapy.

Supplemental *oxygen* may enable you to lead a more normal life. Using *oxygen* is safe if used properly. You will not become addicted to *oxygen*. If your physician prescribes 1 l/m of *oxygen* during sleep, it does not mean you will require 2 l/m continuously in 6 months. Using *oxygen* is like taking supplemental vitamins. If you need extra vitamins you would take them knowing your body needs an extra boost. This is true if you need supplemental *oxygen*. If your

lung capacity is not quite sufficient to give the body its total requirement of oxygen, a supplemental supply during rest, exercise or perhaps continuous use will be necessary; however, it is also reassuring to know that even if you are a continuous user of *oxygen*, it is perfectly safe to take the oxygen cannula off for brief periods. Check with your physician to see how long he/she feels you may do without your oxygen if you are a continuous user of *oxygen*.

Breathing Medications For Your Child

Just as the adult with lung disease who may feel confused with so many kinds of medications, parents and grandparents of children with asthma and other related lung diseases probably feel overwhelmed as well. A child may feel confused too. He or she may even feel resentful.

There are many medications to treat your child's breathing problem. These medications help clear the airways and reduce inflammation of the airways. They can be given in many forms: IV therapy, shots, pills, liquids, aerosol treatments and metered dose inhalers. Children do not always require continuous medication. This too can be confusing.

The following is a brief overview of children's breathing medications. Emergency medications will not be discussed as this would be beyond the scope of this manual. The primary hope is for you to understand the day to day management of your child's health. Your child's physician should work closely with you and your child to determine how much and with what regularity medication should be taken.

The primary medications for treatment are bronchodilator drugs which open the airways and antiinflammatory drugs which reduce inflammation and mucous secretion.

Bronchodilators

Some bronchodilators most commonly prescribed are albuterol (*Ventolin* or *Proventil*), *isoetherine* (*Bronkosol*), *metaproternol* (*Meteprel*) and *terbutaline* (*Brethine*). These are often given 3 to 4 times a day from a metered dose inhaler for children 6 years of age or older. Younger children may often use them with a spacer or holding chamber. These bronchodilators may also be given via aerosol treatments. Aerosol treatments may be given to children as young as 18 months or even younger. These bronchodilators are also used to help prevent attacks for children who have asthmatic symptoms only following exercise. Two inhalations from a metered dose inhaler immediately before exercise and post exercise often allows your child to normally participate in sports and exercise. Orally taken medications are not very effective as compared to the aerosolized forms and the dose by the aerosol route is 10 to 15 times less than that required when the drug is taken by mouth.

If your child does not get enough relief from the medications just mentioned, there is another family of bronchodilators called *theophylline*. This is the generic name. There are dozens and dozens of brand name *theophylline* products. Since there are so many *theophylline* preparations from time released, to rapidly absorbed liquids or uncoated tablets, and since the prescribed dosage varies with patients, it is recommended that all children treated with *theophylline* regularly should have their *theophylline* levels measured initially and at approximately 6 month intervals thereafter. Diet, age, weight, the type of *theophylline* medication and health of your child are variables which effect the proper dose of *theophylline* your child may require. As parents of young children who take *theophylline*, you should know the signs and symptoms of too much *theophylline*. If your child becomes nauseated, vomits, has headaches and or is jittery, the next dose or two should be omitted and you should immediately contact the doctor.

Antiinflammatory Drugs

As mentioned earlier, an antiinflammatory drug reduces inflammation and mucous production of the airways. One antiinflammatory drug is **cromolyn sodium (Intal)**. *Cromolyn*, in place of a NSS, is often combined with *Ventolin* or *Alupent*. Regular use of *cromolyn*, 4 times per day, has been found to help prevent asthma attacks. An important advantage of *cromolyn* is that it is virtually free from side effects.

Steroids

And, lastly, *corticosteroids*, which is also an antiinflammatory medication, is used in treatment when other drug therapy is not effectively controlling the child's asthma. *Corticosteroids*, often called **steroids**, taken by mouth may first be prescribed daily at a rather high dose; and, then a gradual tapering off to a level dose every other day is desired. *Steroids* may also be aerosolized by a metered dose inhaler; however, as with other inhaled drugs, children under 6 years of age may have difficulty.

This was a very brief overview of the many medications which your child may be taking. Properly taking the prescribed amounts of medication by your child is what counts.