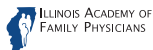


LeRoy M. Graham, Jr., MD • Tim J. Vega, MD, FAAFP
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THE ESSENTIAL GUIDE TO THE MANAGEMENT *of* ASTHMA



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TO THE
MANAGEMENT
of
ASTHMA

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The information in this book is based on the training, personal experience and research of the authors. It is intended for educational purposes, and is not meant to diagnose, prescribe, or replace medical care. Because every person and situation is unique, the authors and publisher urge the reader to check with a qualified health care professional for appropriate diagnosis and management.

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WHY ME?

You are reading this book because you have been diagnosed with asthma. We'd like to help you understand what asthma is, and to explain how you can work with your doctor for the best control of your symptoms. We hope to be of help in answering questions you may have. The more information you have, the better you will feel about managing your asthma and living the healthy asthma lifestyle.

You are not alone. Over 34 million Americans have been diagnosed with asthma during their lifetime, and 9 million of these Americans are children. Asthma is a serious disease, responsible for a half million hospitalizations each year. It is one of the most common causes of pediatric hospitalizations.

Because you are the only one who can track your symptoms, it is really up to you to manage your asthma. Understanding what asthma is and knowing the role played by medications is the first step. Then you can work with your doctor to develop an Asthma Action Plan. This will give you the positive results expected from good asthma control.

This guide may further explain the information and advice your doctor has given to you. But remember, it is for your information only, and does not replace the one-on-one advice you get from your physician.

YOUR HEALTHY RESPIRATORY SYSTEM

Asthma is a disease of the respiratory system, so we will start by learning about that part of the body. The respiratory system moves air in and out of your body, bringing oxygen to your blood and releasing carbon dioxide, which is the body's waste gas. This system is made of the airways, lungs, small blood vessels, and breathing muscles.

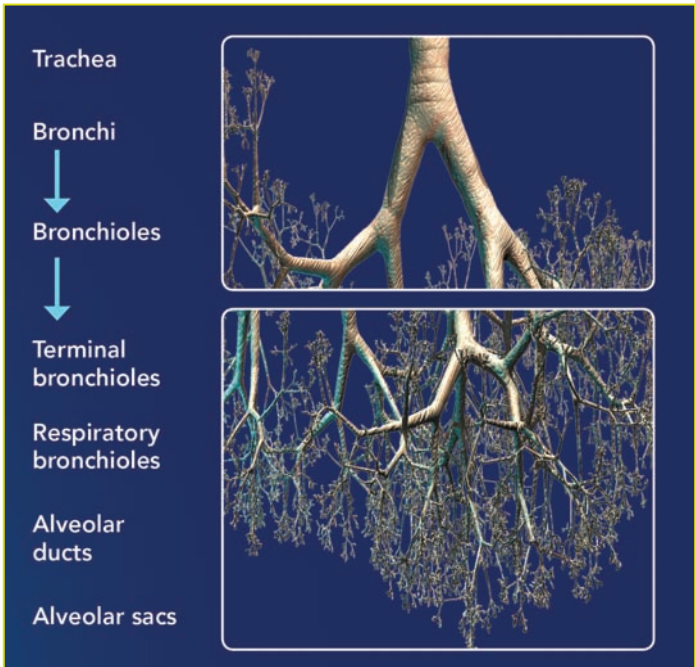
Imagine you are a molecule of oxygen in the air we breathe. Your journey must take you safely from the outside air, deep into the lungs where you will be able to enter the bloodstream. The bloodstream is where you are needed!

First you enter the airways that start in the nose and mouth. The nose is the body's air filter, making the air we breathe clean, warm, and moist. Cold dry air is irritating to the airways, something you might notice when you step outside on a cold winter's day.

After passing through the nose, the air moves down to the throat and the larynx (LAR-ingks), which is commonly called the 'voice box.' The larynx is part of the trachea (TRA-ke-ah), a tube that takes air from your throat down into the chest. Next, in the chest, the trachea divides into two separate airway tubes called the bronchi (BRON-ki). Each of these bronchi serves one side of the chest, dividing into many smaller airways as they enter the lungs. As you will learn later in this book, the small airways deep in the lungs are very important in the treatment of asthma.

The lungs are two spongy air-filled sacs on either side of the chest. There are about 30,000 tiny airways within each lung, called bronchioles (BRON-ke-oles). Surrounding these

Internal Lung Structure



bronchioles are small muscles that automatically control the flow of air by changing the width of the airways.

Bronchioles are less than 1/16 of an inch in diameter, getting smaller and smaller until they end in tiny air sacs deep within the lungs. The air sacs are called alveoli (al-vee-oh-lie). Alveoli are covered with a network made up of tiny blood vessels called capillaries (CAP-ill-air-ees). These capillaries are so small that the blood cells must travel single-file through them. This network of tiny blood vessels is where you, the oxygen molecule, can finally be transported into the bloodstream.

And as oxygen moves into the blood, the toxic carbon dioxide moves out so it can be exhaled. There are about 300 million of these alveoli in the lungs; stretched out, their surface area could cover a tennis court!

But how do we draw air into the lungs deep enough to reach the alveoli?

There are three sets of muscles that help us move air in and out. Pay attention to each set as you breathe while reading about them here.

First, the diaphragm – a big dome shaped muscle that separates the abdomen from the chest cavity. When we pull down on the diaphragm we expand the chest cavity. This expands the lungs, drawing air in. When we relax the diaphragm, it pushes up and pushes air back out of the lungs.

The Respiratory System

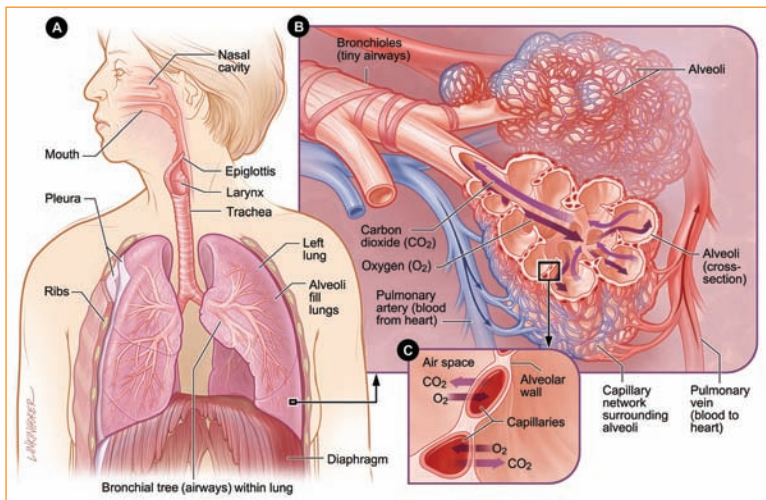
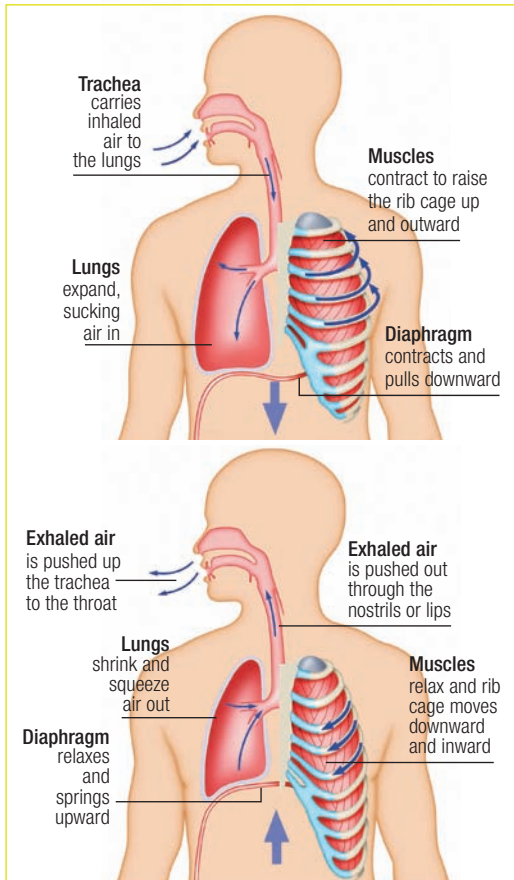


Illustration: Michael Linkinhoker, Link Studio, LLC, for National Heart, Lung, and Blood Institute, National Institutes of Health

Between each rib are muscles that pull the ribcage out, helping to expand the chest and lungs to pull air in. When these muscles relax, the ribcage settles back into place and pushes air back out again.

When needed, the muscles in the abdomen will help move air. These muscles are accessories, coming into play only when the respiratory system is under stress.

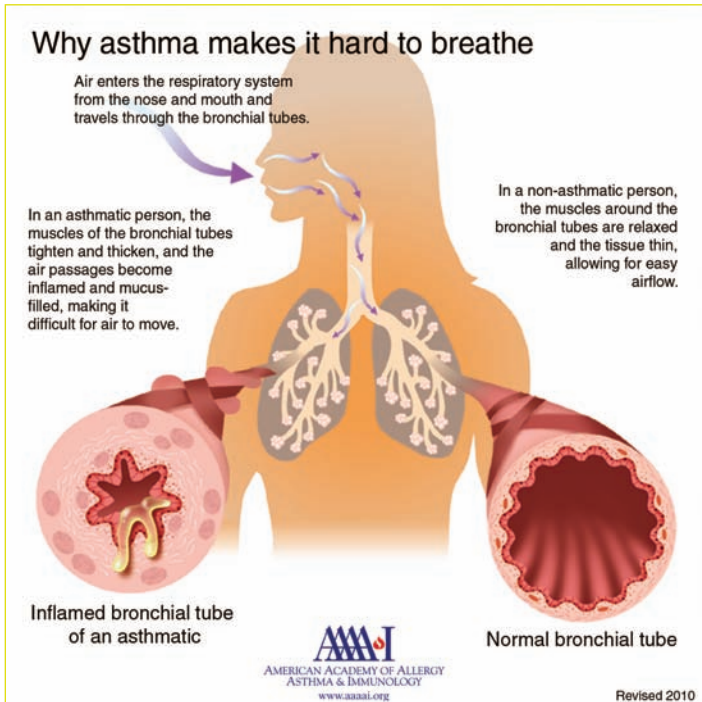
How Breathing Works



WHAT IS ASTHMA?

Asthma is chronic (long term) inflammation of the airways. People with asthma have very sensitive airways that easily become irritated and inflamed.

Inflammation is not always a bad thing; it is the body's normal and protective response to irritation, injury, or infection. You can see the signs of inflammation when you injure yourself: redness, swelling and pain. But inflammation in the airways causes some unique problems.



Source: AAAAI and www.aaaai.org

Airway inflammation causes increased mucus production in an attempt to coat and protect the airway walls. Defensive cells flow to the irritated areas, bringing extra fluid which creates swelling. Then the muscles that surround the bronchioles go into spasm. All of these actions cause the airways to narrow and become blocked or obstructed.

Your body has a dramatic and protective response to blocked or obstructed airways. When the large airways (the bronchi) are inflamed, it creates symptoms that are easy to see and feel. You may have coughing episodes as your body attempts to clear the extra mucus that is building up. Coughing occurs frequently in the morning and evening hours. Wheezing, becoming short of breath, and tightness in your chest are other symptoms you might notice when your airways are inflamed.

The small airways deep within the lungs are often the source of the most severe asthma attacks, and the first signs of inflammation there may not cause obvious early symptoms. If the inflammation of the small airways is unrecognized and left untreated, it will lead to more frequent and severe asthma attacks.

Later in this book, we'll show you a ***spirometer***, the machine your doctor uses to measure lung function. The spirometer often indicates inflammation and obstruction in the small airways before you even notice any symptoms. This test can help you and your doctor prevent serious asthma attacks, and also prevent asthma symptoms that may limit activities you enjoy.

In some people, poorly controlled asthma may result in permanent damage and scarring to the lungs, called 'remodeling.' Sometimes the airway inflammation that occurs during asthma attacks is only partially reversible. Permanent structural changes can take place and these changes can cause a loss of lung function that gets worse over time. Unfortunately, we cannot yet predict which asthma patients may develop scarring, 'remodeling' of small airways, and loss of lung function.

This is why effectively treating inflammation in the small airways and checking lung function is so important for asthma control.

WHY ME?

The exact causes of asthma are still unknown. We do know that a personal or family history of hay fever or allergies increases a person's risk of developing asthma. Exposure to passive cigarette smoke in childhood also increases the risk. It is estimated that about 70% of people with asthma also have acid reflux, or heartburn. When the contents of the stomach regurgitate up into the esophagus or the mouth, it can irritate and inflame the airways. Sometimes there are no obvious symptoms of reflux – no burning, burping, or nausea. This type of 'silent reflux' can cause difficult-to-treat asthma, particularly when it is not recognized and treated.

How allergies make us sneeze and wheeze

1. Pollen, dust or animal skin flakes enter the eyes, nose or lungs. When these allergic "triggers" enter the bodies of people who have allergies, their immune systems overreact.



2. The body produces antibodies, which work to fight the trigger.



3. The antibodies attach to allergy cells, which release strong chemicals into the tissues when they contact allergic triggers. The major chemical, called histamine, irritates the body, causing itching, swelling and tearing.

There are many triggers for exacerbations or “flare ups” of asthma. These include:

- **Allergies** – exposure to both indoor and outdoor allergens (things you are allergic to)
- **Cigarette smoke** – either directly, or being around others who smoke
- **Dirty air** – pollutants, perfume, solvents, soaps, and other air irritants
- **Infections** – colds, flu, sore throats and sinus infections
- **Heartburn** – gastro-esophageal reflux
- **Weather** – dry wind, cold air, sudden weather changes
- **Exercise** and other activities that make you breathe harder
- **Strong emotions** that can cause a change in breathing and a change in airway muscles
- **Some medications** – including aspirin and beta-blockers

HOW IS ASTHMA DIAGNOSED & MONITORED?

When you tell your health care provider about your symptoms, he or she will ask you questions. Some of these questions will be about your personal history – whether or not you have environmental allergies, are exposed to cigarette smoke, either directly or second-hand, and other important details. Your doctor may want to know if anyone else in your family has allergies, or has been diagnosed with asthma.

After careful consideration of your medical and family history, the doctor will do a physical exam that will focus on your respiratory system. Based on this exam, some tests (including lung function or spirometry) may be ordered. All of these tests are painless and usually performed in your doctor's office or clinic.

Spirometry



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Spirometry measures how fast and how much air you breathe out.

The tests that help diagnose asthma measure your ability to move air into and out of your lungs.

- **Spirometry** (spa-ROM-a-tree) means ‘measuring of breath’. It is very simple: You breathe into a mouthpiece that is connected to a small device called a spirometer. This instrument will measure ***the amount of air and how fast you breathe in and out.***
- **FEV1** stands for “Forced Expiratory Volume in the 1st second.” This test measures ***the maximum amount of air you can force out of your lungs in a single second.*** Your personal FEV1 is compared to what is expected for some one of your race, height, weight and age. If it is greater than 80% of what is expected and you have never been tested before, it is considered normal. If less than 80%, it indicates some airway

Peak Flow Meter



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Measuring your breathing with a peak flow meter

obstruction that should be investigated. This test should be repeated periodically to help your doctor better determine your normal, best lung function.

- **Peak Flow** is a portable, personal measure of how hard you can breathe air out (exhale.) The Peak Flow measurement can be a very helpful tool for managing your asthma. First you establish your 'personal best' – the best you can exhale when you are completely without asthma symptoms.

Then, when you check your Peak Flow each day, at the same time of day, you will see if you are close to your personal best. Inflamed airways cannot push air out very well, so if the Peak Flow is lower than expected, you probably have inflammation that has not yet caused any coughing or wheezing symptoms. This is the best time to treat your asthma with your rescue medicine, before it even has a chance to cause uncomfortable symptoms.

ASTHMA IN CHILDREN

Children currently miss more than 13 million days of school every year because of asthma, and the incidence of asthma affecting children is increasing in numbers each year. This is particularly true for African American and Latino children in the urban environment.

The exact reason for this increase is not known, but it may be due to a decline in air quality, to genetic factors, to passive smoke exposure in childhood, to stress, or to other unidentified factors. Indoor allergens are a significant risk factor for developing asthma - dust, animal dander, mold, and other indoor air contaminants. Silent acid reflux may also contribute to childhood asthma symptoms.

Asthma in children has unique risks. Children's airways are already narrower than adults, so even a small amount of inflammation and swelling can cause serious respiratory distress. Symptoms can appear suddenly and rapidly become life-threatening. This is particularly true for toddlers and young children.

With the stakes so high in children with asthma, it is important to diagnose asthma early and treat it effectively.

What symptoms might mean your child has asthma? A persistent night-time cough, even without any other symptoms, may be the first sign of asthma. A child who is having difficulty breathing, using belly muscles to help move air in and out, breathing rapidly, unable to keep up with his or her playmates, or complaining of tightness in the chest may have asthma.

If a child has significant difficulty breathing, is anxious because they are short of breath, sweating, blue or gray in the face and lips, and appears drowsy or confused – that child needs emergency treatment immediately.

Management of asthma in children starts with avoidance of all asthma triggers. Do all you can to control allergies by removing allergens and irritants from the home. Avoid all sources of smoke, stop smoking in the home, and control the home environment for humidity, dust, and animal dander. Any child over the age of two years can learn to rinse their nose, removing many allergy and asthma triggers before they have a chance to cause inflammation. For help with this, go to www.nasopure.com.

Careful monitoring of a child's symptoms is essential to good control. You can't really rely on Peak Flow measurements in



Source: BeWell Health, LLC

Performing a nasal rinse

children so it's important to learn to recognize your child's early signs of respiratory distress. Working with your doctor on an Asthma Action Plan is essential to successful management.

The types of medications used for children are the same as those used for adults, but the doses and methods of delivery are different. Children may need to use nebulizers (machines that provide an easy to breathe-in medicated mist), hand-held inhalers assisted by spacer devices, or medications by mouth instead of hand-held inhalers.

Parents may fear giving their children steroids. The most common steroids used in treating asthma in both children and adults are inhaled steroids. These are given in very small doses (micrograms). Occasionally, larger doses of steroids (milligrams) by mouth or injection are required for serious or potentially life threatening asthma attacks. The concern about steroid use in children has been thoroughly investigated and it has been found that there is without question more benefit in effectively treating asthma than there is risk in the use of these steroids.

EXERCISE INDUCED ASTHMA

Some people get asthma symptoms when they exercise. Within five to twenty minutes of starting to exercise they will get a tight chest and begin to cough and wheeze. These people are especially sensitive to cold dry air and to inhaled allergy triggers. If asthma symptoms only occur during exercise, it can be managed by pre-treating with effective inhaler therapy. Note: Exercise symptoms might also indicate poorly controlled persistent asthma that is triggered by exercise.

ASTHMA IN PREGNANCY

Asthma affects 4%-8% of all pregnant women. Any woman who has asthma while pregnant should be monitored at each prenatal visit for her level of asthma symptom severity. Her symptoms need to be well controlled for both her and her baby's health. Poorly controlled asthma during pregnancy may be dangerous for the developing baby because it can decrease the flow of blood and oxygen to the placenta.

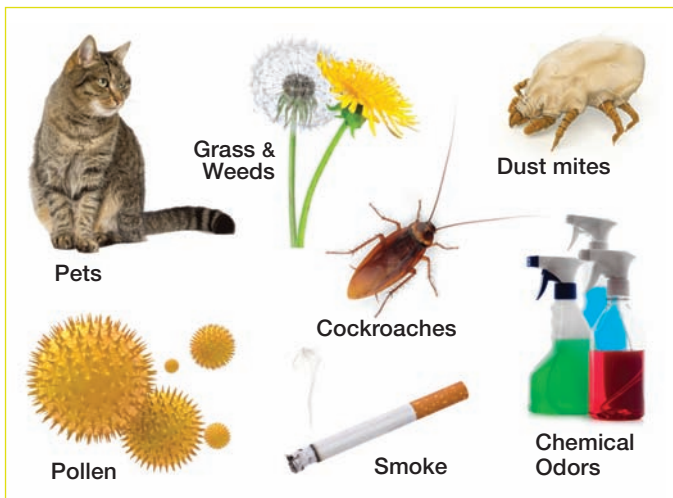
The medications used for asthma control are safe to use during pregnancy, but the lowest possible dose that provides good control is the goal of treatment. Asthma flares should be taken seriously and treated promptly.

PREVENTION OF ASTHMA ATTACKS

There are a few simple measures you can take to prevent asthma attacks.

- Avoid known **triggers** and treat allergies adequately.

Asthma Triggers



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- **Rinse your nose** (your body's air filter) every time you brush your teeth. This will help decrease allergic reactions, upper respiratory infections, and sinus infections – all of which can cause more asthma attacks.
- **Wash your hair at night** before you go to bed if you have been outside when pollen levels are high. This will help prevent your nose being on a pillow that is contaminated with allergens from your hair.

- Monitor your peak flow to prevent severe exacerbations and faithfully use your Asthma Action Plan.
- See your doctor regularly for asthma checkups and lung function testing.
- Use daily medications (controllers) as instructed by your doctor to **prevent** inflammation of your airways.
- **Keep your rescue inhaler with you at all times.**

ASTHMA ATTACKS HAVE DIFFERENT STAGES OF SEVERITY AND RISKS

The treatment of an asthma attack or flare-up depends on your symptoms and which stage of severity you are currently experiencing. This is why it is important to be able to identify your level of severity. It is also important to note that you can change from mild to severe very quickly, and when that happens, your management plan must also change quickly.

Your doctor should provide you with an Asthma Action Plan that tells you how to treat your asthma based on the severity of your symptoms. It should also clearly indicate when you need to contact your doctor or seek urgent or emergency care.

Asthma can have intermittent (only occasional) symptoms or persistent symptoms. Your doctor will determine if your asthma is intermittent or persistent based on the information you provide and from the results of your lung function tests. Your doctor will also take into account your level of risk. The level of risk considers the likelihood of having frequent asthma exacerbations, an overall worsening of lung function, or adverse effects from medications.

This diagnosis and risk assessment is important because it will help your doctor decide what therapy you need to treat and to prevent asthma attacks. Intermittent asthma requires only the occasional use of rescue therapy. Persistent asthma requires daily therapy to prevent asthma attacks and other complications, like airway remodeling or scarring.

Persistent asthma is divided into mild, moderate or severe – stages of severity that help your doctor determine the best daily therapy for you.

The table below outlines the features of each level of severity.

• **Intermittent**

- Occasional symptoms that happen less than two days each week
- Asthma awakens you at night less than twice each month
- You need to use your rescue inhaler less than two days a week
- Asthma does not interfere with your normal activities
- Your measured Peak Flow or lung function is greater than 80% of your personal best or the predicted average for someone like you

• **Mild Persistent**

- Symptoms more than twice a week, but not daily
- Asthma awakens you at night 3-4 times each month
- You need your rescue inhaler more than twice a week, but not daily
- You have shortness of breath, but only with activity
- Your measured Peak Flow or lung function is still greater than 80% of your personal best or the predicted average for someone like you

• **Moderate Persistent**

- Symptoms occur every single day
- Asthma awakens you at night more than once a week, but not every night

- You need your rescue inhaler every single day
- Shortness of breath limits usual activities
- Your measured Peak Flow or lung function is less than 80% of your personal best or the predicted average for someone like you

• **Severe Persistent**

- Symptoms throughout the day
- Asthma awakens you often each night
- You need your rescue inhalers several times each day
- You are short of breath even when doing regular activities or resting, and it interferes with conversations
- Your Peak Flow or lung function is less than 80% but greater than 60% of your personal best or the predicted average for someone like you

It is important to realize that a severe asthma attack is possible at any level of asthma severity and may become life threatening as described here:

• **LIFE-THREATENING**

- Your peak flow is less than 50% of your personal best
- You are too short of breath to speak
- You are sweating, confused or weak
- Your skin is turning gray or blue
- You are at risk of death and should seek **immediate medical attention** (call 911 and/or be taken to the nearest emergency room)

ASTHMA TREATMENT PLANS

It is very important that you understand asthma and the tools used to manage your symptoms. All asthma treatment plans depend on the severity of your symptoms and the level of control you have been able to achieve. Other health problems that could make your asthma more difficult to control should be taken into consideration and discussed with your doctor.

The medications used to treat asthma are specific for the symptoms and level of control you need. They are increased when needed, and decreased whenever possible - but only as directed by your physician. The goal is to ***use the minimum medication necessary to maintain control and prevent long-term lung damage.***

Persistent asthma is a chronic inflammatory disease, so long term control is best achieved with medications that decrease inflammation. Inhaled steroids are currently the most effective medications at controlling persistent symptoms and protecting the small airways deep in the lungs.

Asthma symptoms vary over time, so when control is achieved, regular monitoring and follow-up is important. Regular check-ups with your doctor are essential, even when you are in good control. Of course, you should see your doctor any time your Action Plan is not working as it should.

METERED DOSE INHALERS

Most medications for asthma are inhaled, either with a metered dose inhaler (MDI) or a nebulizer.

Nebulizer Use



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Metered Dose Inhaler

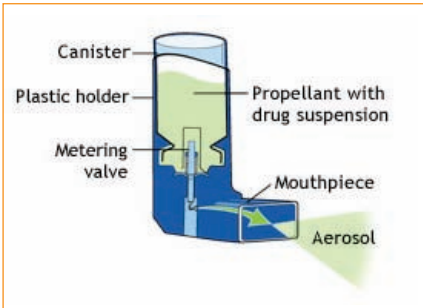


Image courtesy of Asthma Society of Canada

In order to get the maximum benefit from any medication, it is important to use it properly. This is especially true for medications that are inhaled.

Here are some good tips for using your metered dose inhaler (MDI) correctly:

- 1. Remove the cap from the mouthpiece and shake the MDI well.**
- 2. Exhale slowly**
- 3. Hold the inhaler upright and place it in front of your mouth – NOT in your mouth. If you are using a spacer, you may place the spacer in your mouth. Keep your mouth slightly open. Breathe in deeply (and at the same time) press the inhaler between your thumb and forefinger. This forces the medication from the inhaler in a “puff” that you then inhale into your lungs.**
- 4. Remove the inhaler from in front of your mouth, holding your breath for a few seconds. Then exhale slowly.**

Most inhaler instructions ask you to take two puffs, but give the first one a chance to work before you take another dose. You need to wait about two minutes before taking the second puff, using the same technique as described in steps 1, 2, 3 and 4 on the previous page.

Children and adults may benefit from the use of a device called a ‘spacer’ or ‘holding chamber’ with MDI inhalers. This can increase the amount of medication that reaches the lungs. This device, which attaches to the mouthpiece of your MDI, catches the mist, allowing you to get more medication without having to worry about coordination of your breathing when the “puff” is released.

Inhalers & Spacers

Using an inhaler with a spacer



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Spacer used with a mask for a young child



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Inhalers & Spacers

Spacers are attached to the inhaler to allow the medication to enter the airways. Otherwise the medicine may settle on your mouth and tongue, causing unpleasant side effects and never reaching the site of needed action.



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SPECIFIC MEDICATIONS FOR ASTHMA

Two-by-Two explains the basics of asthma medication:

Medications work on two important parts of your respiratory system:

- *Bronchodilators* (rescue medicines) relax the smooth muscles surrounding the airways, opening them up for better airflow, and
- *Anti-inflammatories* (controller maintenance medicines) treat inflammation within the airways

There are two ways to deliver medicine for asthma:

- Inhaled medicines go directly to the site of inflammation and cause fewer side effects. These are delivered with hand-held metered dose inhalers or with nebulizer machines.
- Systemic (whole body) medicines given by mouth or through injections (shots).

There are two primary goals of asthma medication:

- Rescue from acute asthma attacks, and
- Long-term control to prevent attacks

Rescue Medicines – to be used when symptoms are flaring.

Anyone with asthma should *always* have their rescue medicine close by – in a purse, a pocket, or a holster attached to your clothing. Even when out exercising or running a quick errand, you should always carry a rescue inhaler. This can NOT be stressed strongly enough. Rescue medicine can save your life.

There are four common types of medications used to help with acute, sudden asthma symptoms.

1. The first choice and the most common type of rescue medications are inhaled **“short-acting beta-agonists.”** They are called this because they act directly on the ‘beta receptors’ that control the smooth muscles surrounding your airways. When beta-agonists connect to beta receptors, they relax the muscles that are in spasm. This rapidly opens up the airways, allowing air to move freely.

There are both short-acting beta-agonists (SABA) and long-acting beta agonists (LABA). Only the short-acting ones are used for rescue because the long-acting ones do not work quickly enough to rescue airways from an acute attack.

Beta-agonists can have side effects. These are similar to drinking too much caffeine, and usually pass within a few minutes after you use the medicine. They include anxiety, rapid heart rate, heart palpitations, and hand tremors.

Occasionally beta-agonists will cause some insomnia. But these side effects are well worth the rapid acting, life-saving relief they provide. The side effects also provide evidence that you have effectively inhaled the medicine.

Beta-agonists have limitations. They act quickly, but they only last a little while. Repeated doses are often necessary. In addition, these medications do not treat the inflammation that is the underlying cause of asthma.

2. Another type of medication for asthma rescue is called an **“anticholinergic.”** (Ipratropium bromide is an example of an anticholinergic.) This kind of

medicine is also inhaled through a metered dose inhaler or a nebulizer machine. Anticholinergics act on the muscles to prevent the tightening of the muscle bands around the airways. These are usually combined with SABA medicines for rescue, and are not very good at long term control of asthma.

3. Corticosteroid pills taken by mouth are used for severe acute asthma attacks; these treat the inflammation that causes asthma. Sometimes a single injection (shot) of steroids is used to regain control of asthma symptoms. These powerful anti-inflammatories must be taken exactly as directed by your physician for effective and safe relief. Short term use (less than five days) can have side effects that include sleep disturbances, mood swings, appetite changes, and high blood pressure. Long term use may be necessary, but the risk of side effects should be balanced by the benefits of the medication. Long term use can lead to bone loss (osteoporosis), cataracts, diabetes, an increased risk of infection, and thin skin that bruises easily. If taken for more than five days, oral steroids require a carefully tapered withdrawal to allow the body to re-activate its own source of natural steroids.

4. Epinephrine can save your life in a severe asthma attack. This is an injectable medicine, given either in the emergency department of a hospital or self-injected with an EpiPen. Epinephrine is the strongest rescue medicine there is for an acute asthma attack.

Controller Medications

Controller or maintenance medications are the best way to assure long term respiratory health. Control medicine is used on a daily basis to control inflammation. This helps prevent the permanent damage of airway remodeling and decreases the frequency of asthma flares (exacerbations). There are several types of medications used to maintain control of airway inflammation.

- 1. Inhaled corticosteroids** are the most effective control medications, acting directly on the airways at the site of inflammation. Steroids stimulate proteins in the body that fight inflammation and they block other proteins that cause inflammation. They stop asthma where it starts, preventing the inflammatory reaction in the airways before it can cause damage. Side effects to inhaled steroids are minimal. Occasionally they will cause hoarseness in your voice, or candida (yeast) to grow in your mouth or throat. These risks are lessened if you rinse your mouth after using your inhaler. Small airways are the target for inhaled steroids so the smaller the steroid particle size in your inhaler, the more likely it will be able to reach the tiny airways in your lungs.
- 2. Long-acting Beta agonists (LABA)** simply relax the smooth muscles around the airways. They do nothing about the inflammatory cause of asthma, but used together with inhaled steroids they can help control bronchospasm for twelve hours or longer. This type of control medicine should not be used without steroids to control asthma. Alone, it can actually

increase the frequency of asthma flare-ups. LABA's should **not** be considered a rescue medicine.

There are specific FDA guidelines to the use of LABA medications:

- LABAs should not be used without also using inhaled steroids
- Stop using LABAs as soon as control is achieved and continue the inhaled steroids
- LABAs are not recommended if asthma is adequately controlled with low or medium doses of inhaled steroids

3. Cell Stabilizers (cromolyn and nedocromil) are inhaled medications that stabilize the walls of cells that can cause inflammation. If these cells are stronger and cannot break open, the frequency of asthma attacks is decreased. Cell stabilizers tend to be weaker medications, but help some people who do not need the stronger steroids.

4. Leukotriene Modifiers are oral medicines (taken by mouth). Certain cells make chemicals called leukotrienes (lu-ko-TRY-eens) which increase inflammation, increase swelling, and cause the airway muscles to tighten up. Modifying these leukotrienes with medicine that either blocks their action or production can reduce asthma symptoms, especially if used together with inhaled steroids.

- 5. Injectable (shots) immunomodulators** are for people with moderate or severe allergic asthma that persists in spite of all other attempts at control. These medications block IgE, a part of the immune system that we all have, but one that is responsible for allergy symptoms. Injectable immunomodulators are quite expensive and can (rarely) cause severe allergic reactions, so their use must be worth the cost and the risk.
- 6. Theophylline** is an older oral medication, only occasionally used for asthma control. We mention it here for historical purposes, just in case you have heard of it or know someone who has used it. Theophylline requires testing blood levels, and has been replaced by more effective, less problematic medications.

ASTHMA ACTION PLANS

The Asthma Action Plan is the cornerstone of your asthma management. Everything you have learned up to this point comes together in your Action Plan. By now you should have a better understanding of asthma as a disease. You know about Peak Flow, about triggers, and about the symptoms that asthma causes. You have learned about the medications we use to control symptoms and to control airway inflammation. It is time to put it all together into your personalized Asthma Action Plan!

The Action Plan is used for self-monitoring and for the management of asthma. It helps you decide when and how to treat asthma exacerbations.

Your Action Plan will:

- **Help you learn to recognize early signs of asthma attacks**
- **Help you monitor your Peak Flow to identify decreased lung function**
- **Give you guidance on how to adjust your medications**
- **Remind you to identify and remove asthma triggers**
- **Help you monitor your treatment and seek your doctor's advice if your response to medications is not adequate**
- **Allow **YOU** to control your asthma instead of letting asthma control you!**

The Asthma Action Plan is something you develop with your doctor's guidance. You can see some samples of Asthma Action Plans at:

<http://www.cdc.gov/asthma/actionplan.html>

Talk with your doctor to create your own plan, keep it close, keep it current, and take control of your own respiratory health.

ASTHMA AND LIFESTYLE

Are you embarrassed by your asthma? Are you angry that you have to deal with this? How can you handle your feelings about this disease? First, acknowledge and accept these feelings because they are valid and appropriate. Practice good self-care – this will give you back a sense of control. Find a skilled healthcare provider who will work with you, and ask for help when you need it. If you incorporate all the aspects of a healthy asthma lifestyle, you can make it work for you.

A healthy lifestyle for people with asthma lets you manage your symptoms, prevent complications, and fully enjoy everyday routines and activities.

The asthma lifestyle includes:

- **Working with your doctors to achieve control**
- **Never smoking**
- **Using your Asthma Action Plan**
- **Understanding and using your medications correctly**
- **Being aware of symptoms that come with asthma attacks**
- **Using your Peak Flow meter to monitor yourself daily**
- **Controlling asthma triggers and creating an asthma-friendly home and workplace**
- **Exercising regularly**
- **Reducing stress**
- **Becoming an expert on asthma and educating your family and friends**

In this book, we have stressed that you do not have to let asthma control your life. Sometimes, especially when you are first diagnosed, the successful asthma lifestyle may be hard to imagine. But it can be a reality!

CONCLUSIONS

Many have learned to put asthma in its place and they offer advice and inspiration to others. Here are some examples of high achievers who show us how large you can live if you learn to manage asthma well.

- Pop star **Pink**, whose real name is Alecia Moore, started singing, dancing and playing sports while in grade school on the advice of her doctor. She had asthma and her doctor wanted her to strengthen her lungs. Pink was diagnosed with asthma at only three weeks of age, and her distraught parents rushed her frequently to the hospital. But as she got older, Pink fought to control her asthma and won, turning her singing and dancing asthma “treatments” into a lifelong passion for music, hit pop singles and a star career.
- **Dennis Rodman** had an outstanding career in the NBA from 1986 - 2000, winning five championships with the Detroit Pistons and Chicago Bulls. Dennis didn't even play high school basketball and was only 5'11" when he graduated. Only at the age of 20, while working as a janitor in a Texas airport and after having grown to 6'8", did he decide to try for a career in basketball. It was a good decision that led to an amazing, flamboyant, sometimes controversial career that wasn't limited by his exercise-induced asthma.
- **Martin Scorsese** makes no secret of the fact that his love of movies began during his childhood when he ended up spending a great deal of time in the movie

theatre because his asthma prevented him from fighting back on the rough New York streets where he grew up.

- Swimmer **Nancy Hogshead** won three gold medals at the 1984 Olympics despite her asthma. She admits to being surprised when doctors first suggested she might have the disease. “The first time a doctor asked me to get on a treadmill to test for asthma I thought he was crazy,” she said. “I thought people with asthma were sickly wheezers. I was a world champion swimmer, hardly a weakling.” But the doctors were right and Hogshead admits that even though she has asthma she is now healthier than she was during the peak of her swimming career because she has learned how to manage it: “I used to get what I thought were colds and bronchitis that kept me sick for more than a month each year. Before I knew about my asthma I was always struggling to catch my breath and I would frequently cough and sometimes pass out after a hard swim. But now that I know how to control my asthma, I don’t have to miss out on a single day.”
- **Jerome “The Bus” Bettis** - Former halfback for Los Angeles Rams and Pittsburgh Steelers. Jerome became known for the quote: “Asthma doesn’t stop the Bus, and it doesn’t have to stop you.”
- **Chad Brown** of the Seattle Seahawks football team was one of the best defensive linebackers in the NFL. He played in the Super Bowl; was chosen for the NFL Pro Bowl twice; and voted by his Seahawk team members as most valuable player. Chad played with this intensity

despite the fact that in late summer 1998 when he found it hard to breathe and fainted in the hot, sticky air of a game in Dallas, a doctor told him he had asthma.

Chad said, “Asthma is not a death sentence. It shouldn’t keep you on the sidelines unless your condition is very severe, if you follow your treatment protocols. You’re responsible for your medications. Asthma should not prevent you from doing what it is that you want to do. It really shouldn’t. There’s definitely ways to control the condition, and with supervised medical advice, you should be able to live your life just as you want to.

“Don’t let asthma hold you back from what you want to do, from what your dreams are. Like I said, I was actually happy when I was diagnosed with asthma, because it gave me answers to questions that had been plaguing me for over a year. And by getting treatment I am completely able to control my condition. It hasn’t prevented me or stopped me from doing anything. It has actually, by being discovered, helped me to prolong my career and play the way that I play.”

Our current knowledge of asthma and its management is extensive. Work with a caring health care provider to design a personalized Asthma Action Plan. Know your asthma and combine that knowledge with the right therapy. Identify and avoid your triggers. Learn to recognize early symptoms. When you can take control like the well-known people above, you too will enjoy a full and rewarding life without limitations.

LEARN... ACT... BREATHE... LIVE WELL!

FINDING MORE INFORMATION

- Allergy & Asthma Network
Mothers of Asthmatics** 1-800-878-4403
1-703-641-9595
2751 Prosperity Avenue, Suite 150
Fairfax, VA 22030
www.breatherville.org
- American Academy of Allergy,
Asthma and Immunology** 1-414-272-6071
555 East Wells Street, Suite 100
Milwaukee, WI 53202-3823
www.aaaai.org
- American Association for
Respiratory Care** 1-972-243-2272
9125 North MacArthur Boulevard
Suite 100
Irving, TX 75063
www.aarc.org
- American College of Allergy,
Asthma, and Immunology** 1-800-842-7777
1-847-427-1200
85 West Algonquin Road, Suite 550
Arlington Heights, IL 60005
www.Acaai.org
- American Lung Association** 1-800-586-4872
61 Broadway
New York, NY 10006
www.lungusa.org
- Association of Asthma Educators** 1-888-988-7747
1215 Anthony Avenue
Columbia, SC 29201
www.asthmaeducators.org

<p>Asthma and Allergy Foundation of America 1233 20th Street, NW, Suite 402 Washington, DC 20036 www.aafa.org</p>	1-800-727-8462
<p>Centers for Disease Control and Prevention 1600 Clifton Road Atlanta, GA 30333</p>	1-800-311-3435
<p>Food Allergy & Anaphylaxis Network 11781 Lee Jackson Highway, Suite 160 Fairfax, VA 22033 www.foodallergy.org</p>	1-800-929-4040
<p>National Heart, Lung, and Blood Institute Information Center P.O. Box 30105 Bethesda, MD 20824-0105 www.nhlbi.nih.gov</p>	1-301-592-8573
<p>National Jewish Medical and Research Center (Lung Line) 1400 Jackson Street Denver, CO 80206 www.njc.org</p>	1-800-222-LUNG
<p>U.S. Environmental Protection Agency National Center for Environmental Publications P.O. Box 42419 Cincinnati, OH 45242-0149 www.airnow.gov</p>	1-800-490-9198

From the first word, this patient education manual engages the reader. Written by acknowledged experts, it is clear and succinct. The numerous graphics are superb, and the focus on patient outcomes is strong. I recommend it!

– **Barbara Phillips, MD, MSPH, FCCP**

Professor, Division of Pulmonary, Critical Care and Sleep Medicine
University of Kentucky College of Medicine

This informational guide serves as a beacon to help you understand more about what asthma is, and how you can work with your healthcare team for the best possible control of your asthma. The best patient is an informed patient, and this is never more true than in the case of asthma.

- **Cynthia Haines, MD**, Assistant adjunct professor in the Department of Family and Community Medicine, Saint Louis University School of Medicine and author of *The New Prescription: How to Get the Best Health Care in a Broken System* (HCI Books, May 2011)

This asthma book for patients presents an accurate, down-to-earth and very understandable discussion of the causes and management of asthma, both for adults and for children. While presenting the discouraging facts about the worsening statistics and chronic nature of asthma, it is also very upbeat and supportive. The authors, by their approach, empower and encourage patients and parents to take control of asthma and partner with health care professionals in their asthma management. I look forward to being able to share it with my patients and their parents.

- **Christine A. Nelson, MD, FAAP**, Fellow, American Academy of Pediatrics
Co-Author, *Should I Call the Doctor?* and *Where Does It Hurt?*

This book explained, in terms that I could easily understand, not only how asthma affects my body but how I can take control of it to make a better life for myself. The tips and illustrations were great and I refer back to it often!

- **Elizabeth Griffin**, Mother of two children and asthma patient
Charlotte, NC

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