

# ASTHMA MANAGEMENT



The past ten years have brought many changes to the way that we take care of patients with asthma. There has been much focus on asthma care on a national level for at least two reasons. First, the frequency and severity of asthma is increasing nationwide. Although there are many theories trying to explain this, no one understands exactly why this is occurring.

Second, we now understand that chronic untreated or undertreated asthma can result in inflammation to the lungs that is more damaging than asthma experts had previously thought. This potentially irreversible lung damage is referred to as "airway remodeling."

The following series of handouts have been adapted from an expert panel report of the National Institutes of Health (NIH) addressing asthma management. Most of this information is aimed at the patient that has persistent asthma. You and your healthcare provider will decide whether or not you have mild intermittent disease or more persistent asthma. This distinction of intermittent versus persistent asthma will be important in deciding on what therapy is appropriate.

Keep these handouts for reference. Current asthma care involves the patient more than ever in the past. Patients with persistent asthma need to learn to monitor their disease in order to assist their provider in developing an asthma care plan that is "tailored" to their disease. These handouts are intended to help in this goal.

## CONTENTS:

What is Asthma? .....	page 2
How to Control Things that Make Your Asthma Worse .....	page 4
How to Use Your Metered-Dose Inhaler .....	page 6
How to Use Your Peak Flow Meter .....	page 8
Your Asthma Medication .....	page 10
Asthma Education Resources .....	page 12

# WHAT IS ASTHMA?

Asthma is a chronic lung disease that lasts a long time. It cannot be cured, only controlled.

- Airways are inflamed. That is, airway linings are swollen.
- Airways narrow and breathing becomes hard to do. This narrowing gets better (but not all the way in some patients), sometimes by itself, sometimes with treatment.
- Airways are super sensitive. They react to many things, such as cigarette smoke, pollen or cold air. Coughing, wheezing, chest tightness, difficult breathing or an asthma episode may result.

## What are the Symptoms of Asthma?

The main symptoms of asthma are:

- Shortness or breath,
- Wheezing,
- Tightness in the chest, and
- Coughing lasting more than a week.

**Not all people with asthma wheeze.** For some, coughing may be the only symptom of asthma. Coughing often occurs during the night or after exercise. It's important to know that treatment can reverse asthma symptoms. And it's important to treat even mild symptoms of asthma so that you can keep the symptoms from getting worse.

## What Happens During an Episode of Asthma?

Asthma affects the airways in your lungs. During an episode of asthma:

1. **Bronchospasm:**  
The muscles around the airways tighten and make the airways narrower.
2. **Inflammation:**  
The lining of the airways becomes swollen (inflamed) and inflammation produces thick mucus.

## Medication Types

You need to know the ways that asthma affects the airways so you can understand why it often takes more than one medicine to treat the disease. Very simply, some medicines relax the airways (treat the bronchospasm). Others reduce and prevent the swelling and mucus (treat/prevent the inflammation). If asthma is not treated effectively, long-standing airway inflammation can cause irreversible changes in the lungs (airway remodeling) that can negatively impact lung functions for the rest of one's life.

## What Everyone Should Know about Asthma Control

You will learn to take care of your asthma over time. For now, you will be off to a good start if you know just five key things. These five things should guide your efforts to take care of your asthma.

### **Asthma can be managed so that you can live a normal life.**

Your asthma should not keep you from doing what you want. It should not keep you from going to work or school or playing sports. If it does, talk to your doctor about your treatment.

### **Asthma is a disease that makes the airways in your lungs inflamed.**

This means your airways are swollen and sensitive. The swelling is there all of the time, even when you feel just fine. The swelling can be controlled with medicine and by staying away from things that bother your airways.

**Many things in your home, school, work, and other places can cause asthma attacks.**

An asthma attack occurs when your airways narrow, making it harder to breathe. Asthma attacks are sometimes called flare-ups, exacerbations, or episodes.

Things in the air that you are allergic to (like pollen) can cause an asthma attack. So can things that bother your airways like tobacco smoke. You can learn to stay away from the things that cause your to have asthma attacks.

**Asthma needs to be watched and cared for over a very long time.**

Asthma cannot be cured, but it can be treated. You can become free of symptoms all or most of the time. But your asthma does NOT go away when your symptoms go away. You will need to keep taking care of your asthma.

Also, over the years your asthma may change. Your asthma could get worse so you need more medicine. That's why you need to keep in touch with your doctor.

**Asthma can be controlled when you manage your asthma and work with your doctor.**

You play a big role in taking care of your asthma with your doctor's help. Your job is to:

- Take your medicines as your doctor suggests,
- Watch for signs that your asthma is getting worse and act quickly to stop the attack,
- Stay away from things that can bother your asthma,
- Ask your doctor about any concerns you have about your asthma, and
- See your doctor at least every six months.

When you do  
these things  
you will  
**GAIN**  
and  
**KEEP**  
control of  
your asthma.

# HOW TO CONTROL THINGS THAT AGGRAVATE YOUR ASTHMA

You can help prevent asthma attacks by staying away from things that make your asthma worse. This guide suggests many ways to help you do this.

You need to find out what makes your asthma worse. Some things that make asthma worse for some people are not a problem for others. You do not need to do all of the things listed in this guide.

Look at the things listed in dark print below. Put a check next to the ones that you know make you asthma worse. Ask your doctor to help you find out what else makes your asthma worse. Then, decide with your doctor what steps you will take. Start with the things in your bedroom that bother your asthma. Try something simple first.

## **Tobacco Smoke**

- If you smoke, ask your doctor for ways to help you quit. Ask family members to quit smoking, too.
- Do not allow smoking in your home or around you.
- Be sure no one smokes at a child's day care center.

## **Dust Mites**

Many people with asthma are allergic to dust mites. Dust mites are like tiny "bugs" that you cannot see that live in cloth or carpet.

Things that help the most:

- Encase your mattress in a special dust proof cover
- Encase your pillow in a special dust proof cover or wash the pillow each week in hot water. Water must be hotter than 130F to kill the mites.
- Wash the sheets and blankets on your bed each week in hot water.

Other things that can help:

- Reduce indoor humidity to less than 50%. Dehumidifiers or central air conditioners can do this.
- Try not to sleep or lie on cloth covered cushions or furniture.
- Remove carpets from your bedroom and those laid on concrete, if you can.
- Keep stuffed toys out of the bed or wash the toys weekly in hot water.

## **Animal Dander**

Some people are allergic to the flakes of skin or dried saliva from animals with fur or feathers.

The best thing to do:

- Keep furred or feathered pets out of your home.

If you can't keep the pet outdoors, then:

- Keep the pet out of your bedroom and keep the bedroom door closed.
- Cover the air vents in your bedroom with heavy material to filter the air.
- Remove carpets and furniture covered with cloth from your home. If that is not possible, keep the pet out of the rooms where these are.

## **Cockroach**

Many people with asthma are allergic to the dried droppings and remains of cockroaches.

- Keep all food out of your bedroom.
- Keep food and garbage in closed containers (never leave food out).
- Use poison baits, powders, gels, or paste (for example, boric acid). You can also use traps.
- If a spray is used to kill roaches, stay out of the room until the odor goes away.

## Vacuum Cleaning

- Try to get someone else to vacuum for you once or twice a week, if you can. Stay out of rooms while they are being vacuumed and for a short while afterward.
- If you vacuum, use a dust mask (from a hardware store), a double layered or microfilter vacuum cleaner bag, or a vacuum cleaner with a HEPA filter.

## Indoor Mold

- Fix leaky faucets, pipes, or other sources of water.
- Clean moldy surfaces with a cleaner that has bleach in it.

## Pollen and Outdoor Mold

What to do during your allergy season (when pollen or mold spore counts are high):

- Try to keep your windows closed.
- Stay indoors with windows closed during the midday and afternoon, if you can. Pollen and some mold spore counts are highest at that time.
- Ask your doctor whether you need to take or increase anti-inflammatory medicine before your allergy season starts.

## Smoke, Strong Odors, and Sprays

- If possible, do not use a wood burning stove, kerosene heater, or fireplace.
- Try to stay away from strong odors and sprays, such as perfume, talcum powder, hair spray, and paints.

## Exercise, Sports, Work, Or Play

- You should be able to be active without symptoms. See your doctor if you have asthma symptoms when you are active - like when you exercise, do sports, play or work hard.
- Ask your doctor about taking medicine before you exercise to prevent symptoms.
- Warm up for about six to ten minutes before you exercise.
- Try not to work or play hard outside when the air pollution or pollen levels (if you are allergic to the pollen) are high.

## Other Things that can Make Asthma Worse

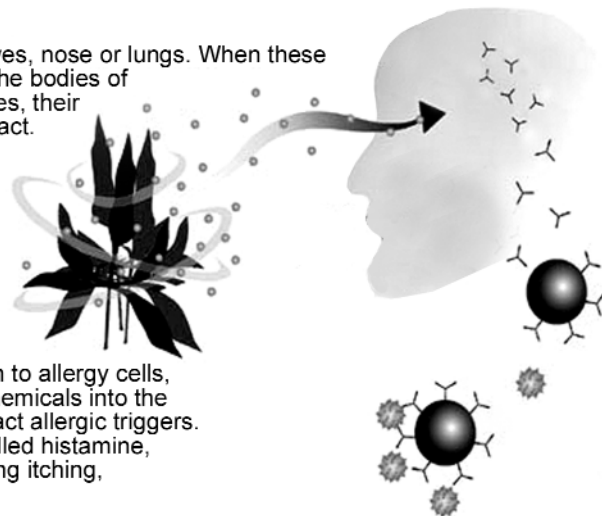
- **Flu: Get a flu shot every fall or early winter..**
- Sulfites in foods: Do not drink beer or wine or eat shrimp, dried fruit, or processed potatoes if they cause asthma symptoms.
- Cold air: Cover your nose and mouth with a scarf on cold or windy days.
- Other medicines: Tell your doctor about all the medicines you may take. Include cold medicines, aspirin, and even eye drops.

## HOW ALLERGENS MAKE YOU SNEEZE & WHEEZE

1. Allergens 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.



Source: American Academy of Allergy, Asthma and Immunology

# HOW TO USE YOUR METERED - DOSE INHALER THE RIGHT WAY

Using an inhaler seems simple, but most patients do not use it the right way. When you use your inhaler the wrong way, less medicine gets to your lungs. Use your inhaler in one of the ways pictured on this page. We recommend using a spacer always, if at all possible. Using a spacer delivers more medication to the lungs. Especially with steroid inhalers, one needs to use a spacer. Not using a spacer with inhaled steroids will increase the amount of medicine delivered to your mouth rather than to your lungs resulting in a higher incidence of steroid side effects. These include yeast infections in the mouth and more steroid absorption into the blood stream. Rinsing your mouth after you use steroid inhalers will also help to reduce side effects.

## Steps for Using Your Inhaler

### Getting Ready

1. Take off the cap and shake the inhaler.
2. Breathe out all the way.
3. Hold your inhaler as picture (preferable A. with spacer)

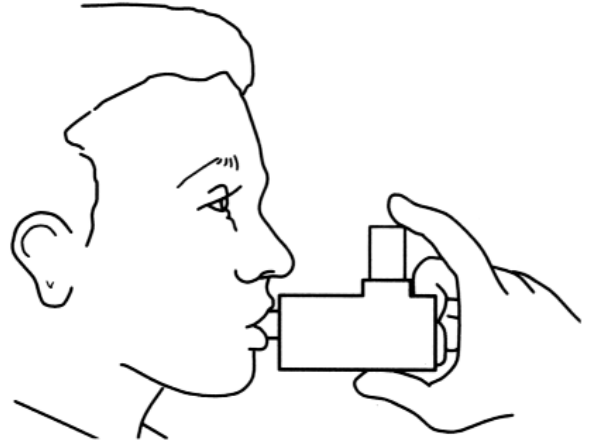
### Breathe in slowly

4. Press down on inhaler and breathe in slowly. If you are using a spacer, you must start to breathe in within five seconds after pressing the inhaler. If you aren't using a spacer device, you must start to inhale as you press down.
5. Keep breathing in slowly, as deeply as you can.

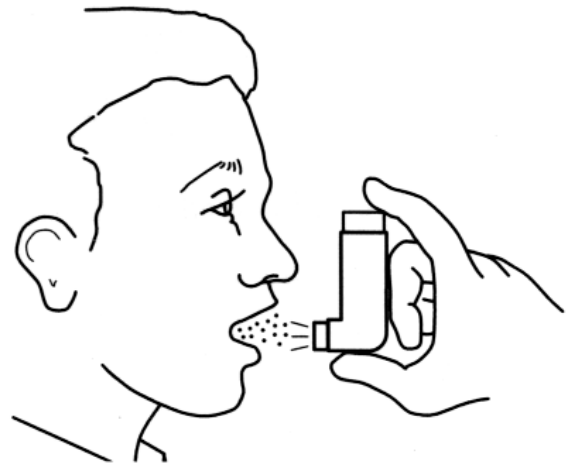
### Hold your breath

6. Hold your breath as you count to ten slowly, if you can.
7. For inhaled quick relief medicine (beta2-agonists), wait about one minute between puffs. There is not need to wait between puffs for other medicines.

- A. Use a spacer/holding chamber. These come in many shapes and can be useful to any patient



- B. Hold inhaler one to two inches in from of your mouth (about the width of two fingers).



### Clean your Inhaler as Needed.

Look at the hole where the medicine sprays out from your inhaler. If you see "powder" in or around the hole, clean the inhaler. Remove the metal canister from the L-shaped plastic mouthpiece. Rinse only the mouthpiece and cap in warm water. Let them dry overnight. In the morning, put the canister back inside. Put the cap on.

### Know when to replace your Inhaler

For medicines you take each day (an example):

Say your new canister has 200 puffs (number of puffs is listed on canister) and you are told to take eight puffs per day.

$200 \text{ puffs in canister} / 8 \text{ puffs per day} = 25 \text{ days}$

So this canister will last 25 days. If you started using this inhaler of May 1, replace it on or before May 25.

You can write the date on your canister

For quick relief medicine take as needed and count each puff. Do not put your canister in water to see if it is empty. This does not work.

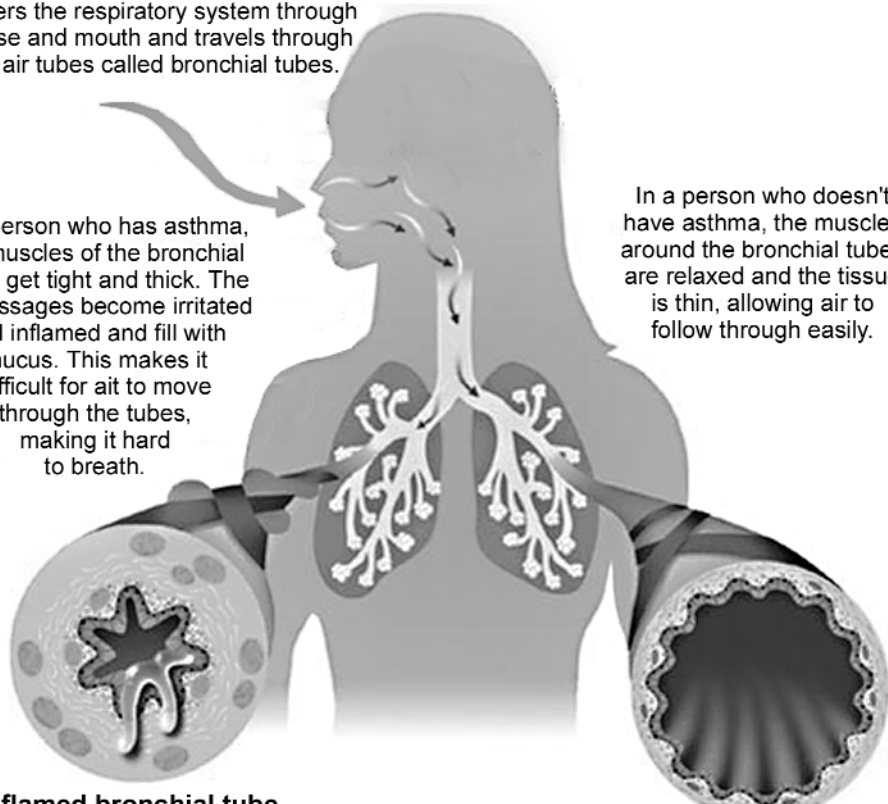


## WHY IT IS SO HARD FOR AN ASTHMATIC TO BREATHE

Air enters the respiratory system through the nose and mouth and travels through large air tubes called bronchial tubes.

In a person who has asthma, the muscles of the bronchial tubes get tight and thick. The air passages become irritated and inflamed and fill with mucus. This makes it difficult for air to move through the tubes, making it hard to breathe.

In a person who doesn't have asthma, the muscles around the bronchial tubes are relaxed and the tissue is thin, allowing air to follow through easily.



**Inflamed bronchial tube of an asthmatic**

**Normal bronchial tube**

Source: American Academy of Allergy, Asthma and Immunology

# HOW TO USE YOUR PEAK FLOW METER

## Starting out: Find Your Personal Best Peak Flow Number

To find your personal best peak flow number, take your peak flow each day for two to three weeks. Your asthma should be under good control during this time. Take your peak flow as close to the times listed below as you can. (These times for taking your peak flow are only for finding your personal best peak flow. To check your asthma each day, you will take your peak flow in the morning. This is discussed on the next page.):

- Between noon and 2:00 p.m. each day.
- Each time you take your quick relief medicine to relieve symptoms. (Measure your peak flow after you take your medicine.)
- Any other time your doctor suggests.

Write down the number you get for each peak flow reading. The highest peak flow number you had during the two to three weeks is your personal best. Your personal best can change over time. Ask your doctor when to check for a new personal best.

## Your Peak Flow Zones

Your peak flow zones are based on your personal best peak flow number. The zones will help you check your asthma and take the right actions to keep it controlled. The colors used with each zone come from the traffic light.

**Green Zone** - (80 to 100 percent of your personal best) signals good control. Take your usual daily long term control medicines, if you take any. Keep taking these medicines even when you are in the yellow or red zones.

**Yellow Zone** - (50 to 79 percent of your personal best) signals caution: your asthma is getting worse. Add quick relief medicines. You might need to increase other asthma medicines as directed by your doctor.

**Red Zone** (below 50 percent of your personal best) signals medical alert! Add or increase quick relief medicine and call your doctor now.

## USING PEAK FLOW ZONES TO HELP MONITOR YOUR ASTHMA

### GREEN ZONE: DOING WELL

- \* No cough, wheeze, chest tightness, or shortness of breath during the day or night
- \* Can do usual activities
- OR-
- \* PEF 80 to 100% of personal best \_\_\_\_\_ to \_\_\_\_\_.

### YELLOW ZONE:

#### ASTHMA IS GETTING WORSE

- \* Cough, wheeze, chest tightness or shortness of breath, or
- \* Waking at night due to asthma, or
- \* Can do some, but not all, usual activities
- OR-
- \* PEF: \_\_\_\_\_ to \_\_\_\_\_  
(50-80% of personal best)

### RED ZONE: MEDICAL ALERT

- \* Very short of breath, or
- \* Quick-Relief medications have not helped, or
- \* Can not do usual activities, or
- \* Symptoms are same or get worse after 24 hours in Yellow Zone
- OR-
- PEF (50% or less of personal best): \_\_\_\_\_

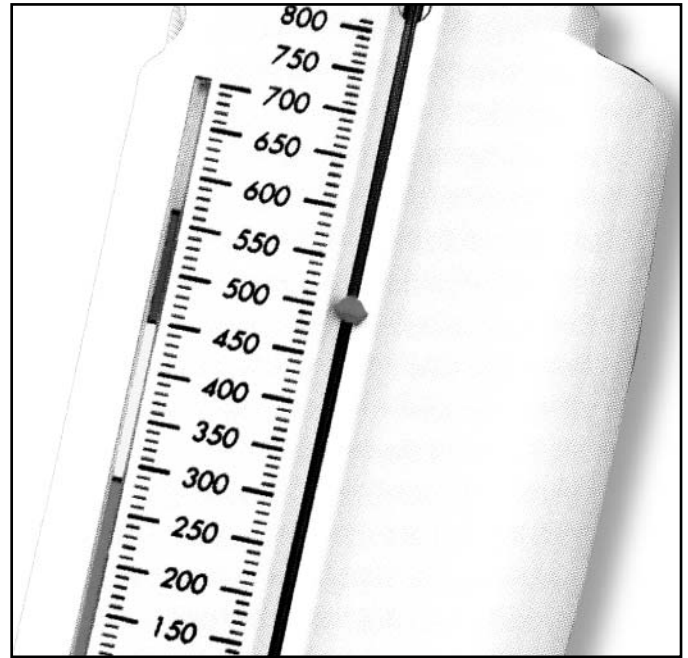
### Ask Your Doctor to Write an Action Plan for you that tells you:

- The peak flow numbers for your green, yellow, and red zones. Mark the zones on your peak flow meter with colored tape or a marker.
- The medicines you should take while in each peak flow zone.

### How to Take your Peak Flow

1. Move the marker to the bottom of the numbered scale.
2. Stand up or sit up straight.
3. Take a deep breath. Fill your lungs all the way.
4. Hold your breath while you place the mouthpiece in your mouth, between your teeth. Close your lips around it. Do not put your tongue inside the hole.
5. Blow out as hard and fast as you can. Your peak flow meter will measure how fast you can blow out air.
6. Write down the number you get. But if you cough or make a mistake, do not write down the number. Do it over again.
7. Repeat steps one through six two or more times. Write down the highest of the three numbers. This is your peak flow number.
8. Check to see which peak flow zone your peak flow number is in. Do the actions your doctor told you to do while in that zone.

Your doctor may ask you to write down your peak flow numbers each day. You can do this on a calendar or other paper. This will help you and your doctor see how your asthma is doing over time.



### Checking Your Asthma: When to use Your Peak Flow Meter

- Every morning when you wake up, before you take medicine. Make this part of your daily routine.
- When you are having asthma symptoms or an attack. And after taking medicine for the attack. This can tell you how bad your asthma attack is and whether your medicine is working.
- Any other time your doctor suggest.

If you use more than one peak flow meter (such as at home and at school), be sure that both meters are the same brand.

### Bring to Each of Your Doctor's Visits:

- Your peak flow meter.
- Your peak flow number if you have written them down each day.

Also, ask your doctor or nurse to check how you use your peak flow meter - just to be sure you are doing it right.

# YOUR ASTHMA MEDICATIONS

## Prevention Medicines

Your doctor may recommend medicines to help prevent asthma attacks during allergy seasons, infections, or before exercising. By using these medicines regularly, as your doctor instructs you, you may be able to prevent many asthma attacks or lessen the seriousness of the asthma attacks you may have. The new information about asthma is showing that prevention of asthma episodes is much more effective than waiting for an attack and trying to get back under control. A good comparison for children is that it's like forest fires- better to prevent one than to try to put out the fire after it's blazing. Review your asthma plan with your doctor regularly so you know just what to do when you are having asthma problems. If your doctor has not recommended a prevention medicine and you are using your quick relief medicine (such as Albuterol Inhaler) regularly (one or more times a week), you should talk with your doctor about changing your asthma plan.

If you use a PEAK FLOW METER, these are the medicines you should use during your GREEN zone. This is when your asthma is not causing breathing difficulties, you are not wheezing or coughing, and your peak flow is above 80% of your personal best level. You should check your peak flow each morning before taking any medicine. This way you will be able to tell if an asthma flare is coming even before you start to feel symptoms

**There are several types of prevention medicines used now:**

**Inhaled corticosteroid,  
anti-inflammatories**  
(Flovent, Pulmicort, Aerobid,  
Azmacort, Vanceril. etc.)

These are inhaled steroid medicines to help reduce and prevent the swelling in the bronchial tubes. They may take a week or two to get to full effectiveness and each type is different in strength, so it is important to follow your doctor's directions and

use these inhalers daily. Rinse your mouth or gargle with water after each use of these inhalers to prevent mouth infections. Some of these medicines come with a metered dose inhaler (the puff-type spray) and should be taken with a spacer device, others are dry powder that the child sucks in from the mouthpiece.

### **Non-steroidal Inhaled anti-inflammatories** (Cromolyn and Nedocromil)

Cromolyn (Intal) is an inhaled medicine used in a metered-dose inhaler or nebulizer to help make the bronchial tubes less sensitive to triggers (such as allergies or exercise). This medicine is taken several times a day on a regular basis. It takes a week or more to reach full effectiveness, so it is important to use it regularly. Nedocromil (Tilade) has the same properties as Cromolyn but is available only in a metered dose (inhaler) form.

### **Oral anti-inflammatory medicines** (Singulair, Accolate)

These medicines are taken daily to help stabilize the bronchial tubes, making them less likely to constrict and swell when you are exposed to asthma triggers such as allergies and infections

### **Long-acting bronchodilators** (Serevent, Foradil, Theophylline)

These medications open the bronchial tubes. Serevent and Foradil are inhalers, Theophylline preparations are taken by mouth. Unlike the quick relief medications, these last 12 hours or more and can be used to help reduce your use of quick relief inhalers, such as Albuterol, especially during school, work, or sleep. Serevent does not work quickly however, and should not be used when you are wheezing and need immediate relief. It is used preventatively. Foradil is used preventatively, but also works quickly when you need immediate relief. Theophylline preparations (Slo-bid, Theodur, etc.) are also long acting bronchodilators but have many side effects and are rarely used today.

### Combination medications

(Advair)

This combination medicine is a dry powder inhaler with an inhaled corticosteroid (Flovent) and long-acting bronchodilator (Serevent) combined. This has the advantage of being able to take two prevention medicines in one dose twice a day. As mentioned, these are both preventive medicines and should not be used for immediate relief when you are wheezing

### Quick Relief Medicines

These are the medicines your doctor may recommend when you start to feel breathing problems (wheezing, coughing or tightness of your chest), and/or your peak flow meter reading is decreasing. If your PEAK FLOW METER shows you are in your YELLOW zone (less than 80% of your personal best level and greater than 50% of your best level), you should use the medicine your doctor recommends even if you do not feel bad yet. DO NOT wait until you feel worse. Your peak flow is a warning sign that your asthma is already causing problems, even if you feel okay.

If you are not improving with your quick relief medicines, you are getting worse, or you are in your RED zone, CALL YOUR DOCTOR. The RED zone is less than 50% of your expected best level. This is a serious asthma attack. IF YOU ARE GETTING WORSE, CALL YOUR DOCTOR. IF THERE IS RAPID SHALLOW BREATHING, SUCKING IN OF THE CHEST WITH EACH BREATH (RETRAC-TIONS), BLUENESS OF THE LIPS OR FINGER-NAILS, GO TO THE EMERGENCY ROOM.

Good technique is very important when your child takes a quick relief medicine from an inhaler or nebulizer. If you are not seeing good response to the medicine, please check with your doctor to be sure that you are using the medication correctly. Children should use a spacer device (such as an Aerochamber or Inspirease) to help the inhaled medicine get to the lungs. If the medicines do not get to the lungs easily, they do not work well.

### Short Acting Bronchodilators

[Albuterol (Ventolin, Proventil), Levalbuterol (Xopenex), Pirbuterol (Maxair), Terbutaline (Brethine)]

These medications help open the bronchial tubes during an asthma episode and are the most often needed "quick-fix" or quick-relief medications. They come in various forms including meter-dose inhalers, liquid and tablets. They all can cause stimulation, shakiness, increased heart rate, and nervousness in some patients. In general the inhaled forms (nebulizer or meter-dose inhaler) work rapidly, i.e., in minutes and last four to six hours, and don't cause as much stimulation. The oral liquid preparations (Albuterol) take longer to work, last four to six hours, and can have more stimulation side effects than the inhaled forms. The albuterol tablets take longer to work, but they also can last for up to 12 hours.

### Anticholinergics

Atrovent is the only quick relief medication in this category. This medication relaxes muscles around the airways. Atrovent is generally used with a short-acting bronchodilator to stop a flare up.

### Oral corticosteroids

(Prelone, Pediapred, Orapred, Prednisone, etc.)

These medicines help reduce the swelling in the bronchial tubes. They are usually given for a short time (i.e., five to seven days) to get your asthma under better control, but occasionally in more severe asthma, they are given for longer periods. They may take 24-48 hours to start helping. Take these medicines with food. Side effects, if the steroids are taken for less than a week, can include increased appetite, nausea and restlessness. Long term steroid use is rarely advised and can have very significant additional side effects, such as high blood pressure, weight gain, stomach, eye or other problems.

## ASTHMA EDUCATION RESOURCES

AMERICAN ACADEMY OF ALLERGY, ASTHMA AND IMMUNOLOGY

tel: 1-800-822-2762

web: [www.aaaai.org](http://www.aaaai.org)

ALLERGY & ASTHMA NETWORK - MOTHERS OF ASTHMATICS (AANMA)

tel: 1-800-878-4403

web: [www.aanma.org](http://www.aanma.org)

AMERICAN COLLEGE OF ALLERGY, ASTHMA AND IMMUNOLOGY

85 West Algonquin Road, Suite 550  
Arlington Heights, IL 60005

web: [www.allergy.mcg.edu](http://www.allergy.mcg.edu)

AMERICAN LUNG ASSOCIATION

tel: 1-800-LUNG USA (1-800-586-4872)

web: [www.lungusa.org](http://www.lungusa.org)

ASTHMA AND ALLERGY FOUNDATION OF AMERICA

tel: 202-466-7643 or 1-800-7-ASTHMA (1-800-727-8462)

web: [www.aafa.org](http://www.aafa.org)

NATIONAL ASTHMA EDUCATION AND PREVENTION PROGRAM

NHLBI Information Center  
P.O. Box 30105  
Bethesda, MD 20824-0105

web: [www.nhlbi.nih.gov/about/naepp](http://www.nhlbi.nih.gov/about/naepp)

NATIONAL JEWISH MEDICAL AND RESEARCH CENTER

tel: 1-800-222-LUNG (1-800-222-5864)

web: [www.njc.org](http://www.njc.org)