

## ASTHMA

By Mark E. Bubak, M.D. and Lowell J. Hyland, M.D

The information in this booklet will help you become familiar with your asthma and its treatment. The more you know about your asthma, the better you can manage it. It is much easier to prevent asthma symptoms than to treat them after they begin. 5 to 6% of the United States is asthmatic. Asthma can start at any age. Although some patients outgrow their asthma, most have it the rest of their life. Our goal is to identify the form of asthma you have, outline a plan to prevent asthma problems and treat symptoms, and educate you about your disease and treatments. Understanding the basics of your respiratory system will help you understand asthma.

### Breathing

Each time you inhale, air moves down the windpipe (trachea) and through the bronchial tubes (bronchioles). These tubes, or airways in your lungs, are a vital part of the breathing process. The tubes lead into air sacs called alveoli. Oxygen passes through the thin walls of the alveoli into the blood vessels. Carbon dioxide passes from the blood through the air sacs to be exhaled (diagram 1).

### WHAT IS ASTHMA?

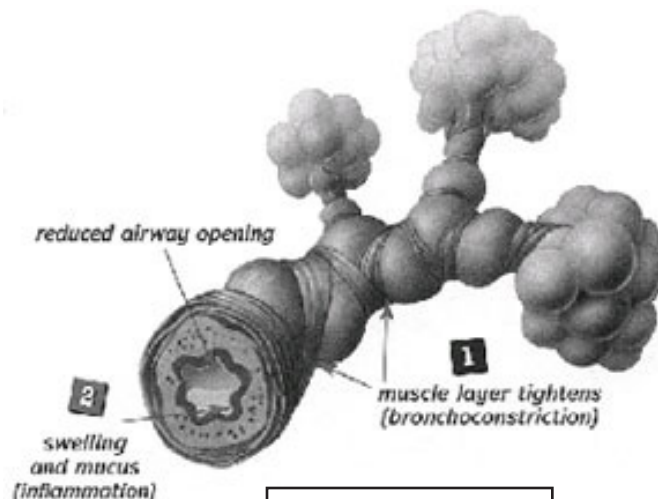
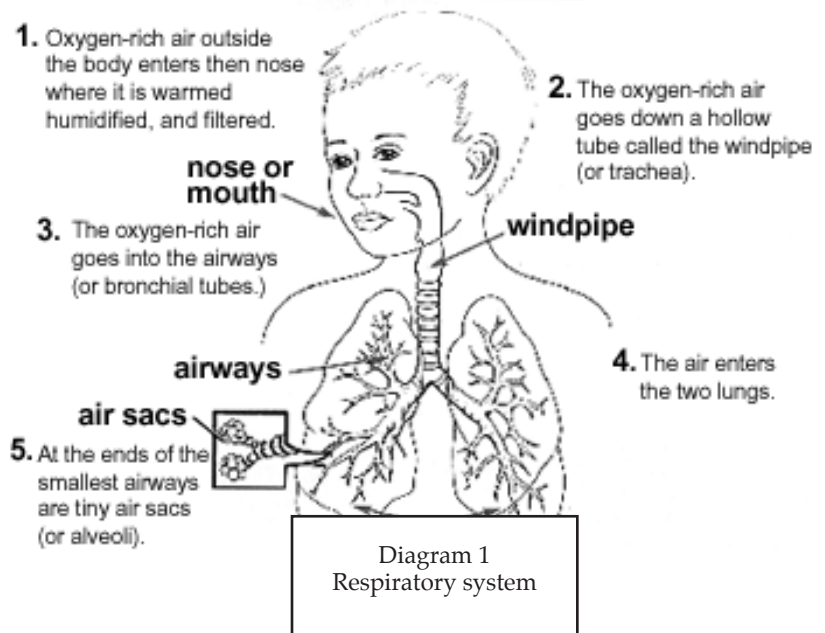
The Asthmatic Lung Asthma is a chronic lung disease that affects mainly the bronchial tubes by blocking airflow through these tubes. During an asthma attack, the tubes become inflamed and obstructed, and the air sacs become enlarged (diagram 2).

#### Changes in Airways

Bronchial tube obstruction may occur because of one or more of the following changes:

- Inflammation: lining of the tubes becomes inflamed (irritated) and swollen
- Bronchospasm: smooth muscles surrounding the bronchial tubes constrict (narrow)
- Mucus production: mucus builds up in the tubes, and it may plug them completely.

### The breathing path...





Mark E. Bubak, M.D. &  
Julie F. Nielsen, PA-C

2200 W. 49th St., Ste. 104  
Sioux Falls, SD 57105

**605-336-6385**  
*YourAllergyRelief.com*

## WHAT ARE THE SYMPTOMS OF ASTHMA?

### **Asthma Attacks** (*Diagram 2*)

When air flows through the narrowed bronchial tubes, one or more of these symptoms may occur:

- Shortness of breath
- Coughing
- Chest tightness
- Wheezing
- Mucus production

Individuals with asthma may experience asthma symptoms in different ways. Some people with asthma have constant or daily symptoms. Other people may have periodic attacks. Attacks can vary from mild to severe and can last a few hours, several days, or longer. Symptoms are commonly worse at night or in the early morning.

### **Mucus, Postnasal Drainage and Cough**

The membranes that line your nose, throat, and bronchial tubes are very sensitive. Normally, they secrete (produce) several ounces of mucus a day to moisten and protect themselves. When these membranes become irritated, congested, and swollen, they secrete an extra amount of mucus. This mucus helps to protect the lungs and nose from irritating particles and infection.

If you have asthma, your membranes are more sensitive to irritants, such as smoke, cold air, strong odors and dust, causing them to secrete more mucus than normal. Infections may cause even more congestion, mucus, and discomfort. However, increased mucus or yellow mucus does not always mean that an infection is present.

Check with your physician if you have more mucus than usual or if it is green- or yellow colored. Although you may be bothered by excess mucus dripping in the back of your throat, the mucus does not irritate the lining. Forced coughing to bring up the mucus, however, irritates the bronchial tubes and can increase mucus production. Avoid forced coughing.

Some people with asthma have a chronic cough as a result of excess mucus. The coughing reflex acts as a protective mechanism to expel the mucus blocking the air passages. This persistent coughing can again lead to more irritation, more mucus production, and more asthma symptoms. Voluntarily suppressing the cough, although difficult, is helpful.

Do not use cough suppressants when a cough is caused by asthma. They are ineffective. Your allergist can prescribe the appropriate medication for treating your asthmatic condition. Drinking extra water and sucking on hard candy or lollipops (preferably sugar-free) also can help decrease the cough.

## WHAT TRIGGERS ASTHMA?

Many people with asthma have inflamed or swollen airways all the time. This makes the airways very sensitive to certain triggers. Triggers vary among people and include anything that causes asthma symptoms to flare. Following are some common triggers. As you read this section, think of the factors present in your surroundings (school, work place, home and environment) that trigger your asthma.

### **Allergy**

Asthma may be triggered by an allergic reaction to animals, dust mites, pollens, mold, or other inhaled substances. There are two main forms of allergic asthma. With the commonly recognize type, symptoms are seasonal or with clear exposures (such as a cat). Chronic allergic exposure can cause the asthma to be worse all the time. Dust mites, living with the animal you are allergic to, and molds often cause this. Allergy testing is very helpful in identifying which substances really cause your problem.



Mark E. Bubak, M.D. &  
Julie F. Nielsen, PA-C

2200 W. 49th St., Ste. 104  
Sioux Falls, SD 57105

**605-336-6385**  
*YourAllergyRelief.com*

#### **Environment**

Cigarette smoke, dust, air pollution, strong fumes, and cold air may irritate the lining of the bronchial tubes. In addition, seasonal changes may worsen asthma symptoms.

#### **Occupational Exposures**

Exposure to substances found at the workplace, such as flour (baker's asthma), wood dusts, and chemicals may trigger asthma symptoms.

#### **Exercise**

Exercise is an essential part of a healthy lifestyle, but some people have asthma symptoms during or after exercise. Learning to exercise safely is crucial for managing your asthma.

#### **Infection**

Respiratory infections commonly trigger asthma symptoms that can be severe in some people. These infections are usually caused by a virus. Medications for bacterial infection (antibiotics) do not work against viral infections. Antibiotics are not routinely needed for asthma attacks. However, more asthma medication may be needed to treat the worsening asthma symptoms caused by a virus (common cold). Viruses that cause asthma attacks are spread by contact. Frequent hand washing and limited hand-to-nose contact may help prevent these infections. Asthma attacks triggered by cold viruses can lead to severe breathing difficulty. Early treatment with asthma medications and consultation with your physician is recommended.

Adults with chronic asthma should receive yearly influenza shots in the fall. Pregnant women and parents of children with asthma should consult their allergist about the need for influenza immunization. The pneumococcal vaccine also is recommended for adults with chronic asthma. This vaccine helps prevent one form of pneumonia.

Side effects from both the influenza vaccine and the pneumococcal vaccine include a sore arm and flu-like symptoms (a feverish feeling and aching). These side effects last about 48 hours and occur in a small percentage of people receiving the vaccines. The U. S. Public Health Service cautions against the use of the influenza vaccine if you are allergic to eggs, chickens, or feathers. It is usually safe to give the vaccine unless there is a definite allergic reaction to eggs.

#### **Aspirin**

Some people develop severe asthma attacks after taking aspirin or aspirin like drugs including ibuprofen, indomethacin, naproxen, and others. Many of these people also have nasal polyps (small, non-cancerous tumors in the nose). If you are sensitive to aspirin, check the labels of all medications before using them. Many pain-relief and cold/relief products sold over the counter contain aspirin (also called acetylsalicylic acid).

Other pain medications, such as sodium salicylate, acetaminophen (Tylenol) and propoxyphene (Darvon), may be taken instead.

## **DIAGNOSING AND MONITORING ASTHMA**

If your allergist thinks you have asthma, tests may be done to confirm the diagnosis and determine the severity of your asthma and identify your triggers. This allows your allergist to make Your Asthma Treatment Plan and modify it as needed.



Mark E. Bubak, M.D. &  
Julie F. Nielsen, PA-C

2200 W. 49th St., Ste. 104  
Sioux Falls, SD 57105

**605-336-6385**  
*YourAllergyRelief.com*

**Asthma Severity Definitions:**

	Mild Episodic	Mild Persistent	Moderate Persistent	Severe Persistent
<i>Classification by worst symptom*:</i>				
Symptoms	≤ 2 times a week	> 2 times a week & < 1 time a day Flares may limit activity	Daily Flares limit activity	Continuous Limited physical activity
Nighttime Symptoms	≤ times a month	> 2 times a month	> 1 time a week	Frequent
Lung Function FEV <sub>1</sub> or PEF	≥ 80% predicted	≥ 80% predicted	> 60% to < 80% predicted	≤ 60% predicted

**Lung Function Test**

The lung (pulmonary) function test detects and measures airway obstruction and response to treatment. It is often repeated on a regular basis. The lung function test will help you and your physician determine how severe your asthma is and how much medication you need. Furthermore, the test will help assess if your current therapy program is effective. Pulmonary function tests (also called spirometry) are among the most important tests for asthma.

**Methacholine Challenge**

Some people with asthma have normal pulmonary function most of the time but have “twitchy” airways that react excessively to irritants. Your allergist may order a test called a Methacholine challenge. For this test, you breathe in a medication and the effect on your lungs is measured to see if you react like a person with asthma. The effect of the medication is brief and can be reversed if needed with bronchodilator medicines.

**X-rays**

Chest x-rays usually do not help in the diagnosis or treatment of asthma. If you have asthma, however, chest x-rays may be taken to be sure you do not have other conditions that mimic asthma.

**Peak Flow Meter**

Peak flow is the maximum speed that you can blow air out of your lungs after taking a full breath. You can measure your peak flow with a peak flow meter. A peak flow meter measures changes in the size of your airways. It measures the rate of flow in liters per minute (peak flow rate).

In certain patients, regularly recording peak flow rates and keeping a diary of symptoms can help identify what triggers their asthma, give an early warning of an upcoming attack, and let them prevent worsening of their asthma by starting their action plan.

**TESTING FOR ALLERGIES**

**The Skin Tests**

An allergy skin test may help diagnose the cause of the allergy. Skin tests are done on the arms or back using either the prick or intradermal method.

In the prick technique, a drop of an allergy-producing substance (allergen) is applied to the skin. The skin is then scratched or pricked. In the intradermal method, a tiny amount of allergen is injected into the skin. Skin tests for most allergens are safe, and the results are available in 20 to 30 minutes. Antihistamine and antidepressant medications affect skin tests and must be stopped before tests are begun. Some antihistamines can interfere with allergy skin tests for weeks. Check with



Mark E. Bubak, M.D. &  
Julie F. Nielsen, PA-C

2200 W. 49th St., Ste. 104  
Sioux Falls, SD 57105

**605-336-6385**  
*YourAllergyRelief.com*

your physician about stopping medications.

Skin tests for tobacco smoke allergy are not useful because tobacco smoke is an irritant, not an allergen.

### **Blood Allergy Tests**

Allergies can also be diagnosed using a blood test. Examples include the radioallergosorbent test (RAST) or the ImmunoCap. They give information similar to the skin test. However, they are more expensive, may miss identifying some allergies, and also take longer to determine the results. The blood test can be used when a skin test would not be suitable. For example, it can be used when a person has a skin disease which does not allow skin tests to be done, or when taking an antihistamine or other medication that might affect skin test results.

Both skin and blood allergy test results must be interpreted by a physician who is experienced in diagnosing and treating allergies and who is familiar with your medical history.

## **MANAGING ASTHMA**

The goal of asthma management is to achieve the best possible control of your asthma at all times with the least amount of side effects from asthma medication. With proper care and treatment, you can usually control your asthma and continue your normal activities.

### **Environment**

The best way to manage your asthma is to avoid triggers that aggravate or cause your symptoms.

### **Allergens**

Avoidance is the most effective way to manage allergic asthma.

If you are allergic to airborne pollens and molds, use air conditioning in your home, your car, and at work. Keeping doors and windows closed also is an effective way to keep out airborne pollens and molds. Dry your laundry inside during pollenation times. Clean up areas of obvious mold growth. Consider a dehumidifier for damp basements. If you have seasonal allergic asthma, it may help to leave the geographic area during the allergy season. For example, if you are allergic to ragweed, consider going to places such as the Rocky Mountains or northern Minnesota during the ragweed season.

If you are pet allergic, removing them from your home and cleaning the house thoroughly may give complete relief of symptoms. If you decide to keep your furry pets, wash them weekly. After washing your cat once a week for several weeks, you may reduce the amount of its allergen that floats in the air (airborne allergen). A special filter such as a HEPA can reduce the dander level in the air. Keep your pets outside as much as possible. Do not let them on your bed or even in your bedroom. Also, keep them out of other rooms in which you spend a lot of time. If you are allergic to animals, do not buy furniture or rugs that are made with animal hair.

For dust mite allergy, encase the mattresses and pillows in allergy control barriers, wash the blankets and sheets weekly, and keep the humidity down. Have the bedroom out of the basement and have smooth floors where possible. If you are allergic to cockroaches, use a roach control method to rid your home of these pests.

### **Irritants**

If you have chronic asthma, avoid irritants such as dust, smoke, and cold air.

Obviously, you cannot completely avoid all irritants, but you can take precautions.

Do not smoke. Try to avoid smoke-filled surroundings. Being in an enclosed space with a smoker can trigger asthmatic symptoms. Make sure your hobbies are not contributing to asthma symptoms. Paint fumes, wood dusts, paint removers and similar irritants can make asthma symptoms worse. Remodeling a room in a house can increase symptoms of asthma due to the presence of these irritants and others, such as dust. If you have a forced-air furnace and are allergic to dust, use a filter for dust control and change it frequently. Avoid doing work that creates dust or working in a dusty environment.



Mark E. Bubak, M.D. &  
Julie F. Nielsen, PA-C

2200 W. 49th St., Ste. 104  
Sioux Falls, SD 57105

**605-336-6385**  
*YourAllergyRelief.com*

Wear a dust mask when it is impossible to avoid being exposed to dust. In cold temperatures, use a cold-air mask that covers your mouth and nose. Avoid smoke of all types: tobacco smoke, smoke from burning leaves, burning rubbish and wood stoves.

Smoke of any kind irritates the eyes, nose, and bronchial tubes.

### **Moving to a different climate**

Most people with asthma will not be helped by moving to a different climate.

### **Adopt a healthy lifestyle**

When possible, reduce tension and fatigue. Although the effects of fatigue and tension on asthma vary from person to person, both can increase the effects of other factors on asthma. Eat nutritious meals, drink adequate water, and get adequate sleep.

Balance work and relaxation.

### **Exercise**

Exercise may aggravate asthma symptoms, but symptoms can be controlled by proper preparation and pre-medication. A number of Olympic athletes with asthma compete regularly and have won gold medals!

Benefits of regular exercise include:

- Reduced chance of further exercise-induced asthma
- Increased sense of well-being
- Improved exercise tolerance and endurance
- Improved quality of life

### **Medications**

If medications are needed to help you manage your asthma, your allergist will help you decide what is best for you. There are many different medications available, and the type prescribed will depend on the severity of your asthma.

Some asthma medications can provide quick relief during an asthma attack by relaxing airway muscles to allow more normal breathing. This type of medication is called a bronchodilator. They are the primary relievers.

Other asthma medications are taken regularly to prevent or reduce inflammation and excessive mucus production and are called controllers. They are generally antiinflammatory medications and need to be taken regularly even if you do not have symptoms.

Children or adults unable to use an inhaler are often treated with a nebulizer. This is a device that vaporizes liquid medication into a fine mist that can be inhaled through a mouthpiece or mask. Less commonly, other forms of medication are used, such as capsules of dry powder for inhalation.

*Never discontinue or cut back on your medications without first discussing it with your allergist. To best manage your asthma, you will want to follow the plan devised by you and your allergist.*

## **SYMPTOM CONTROLLERS**

Patients with persistent asthma should use a controller medication every day. The most effective controllers are inhaled corticosteroids. These agents should be taken regularly to control airway inflammation and can be adjusted based upon asthma severity. While any of the controllers can be chosen for mild persistent asthma, inhaled corticosteroids are the treatment of choice for moderate and severe persistent asthma. Inhaled corticosteroids can be used with a second controller such as an inhaled long acting bronchodilator. Some patients with severe asthma may require 3 controller agents. Other controllers can be prescribed in mild persistent asthma as single agents, or as adjunctive agents in moderate and severe persistent asthma.



Mark E. Bubak, M.D. &  
Julie F. Nielsen, PA-C

2200 W. 49th St., Ste. 104  
Sioux Falls, SD 57105

**605-336-6385**  
*YourAllergyRelief.com*

These controllers include cromolyn (Intal), nedocromil (Tilade), salmeterol (Serevent), theophylline, leukotriene receptor antagonists-zafirlukast (Accolate) and montelukast (Singulair), leukotriene formation inhibitors-zileuton (Zyflo), and allergen specific immunotherapy. Some patients with severe asthma require the continuous (daily or alternate day) use of oral corticosteroids. The dose of corticosteroids must be individualized balancing the need for asthma control with the risk of corticosteroid-induced adverse effects.

### **Corticosteroids**

Corticosteroids reduce inflammation and swelling of the bronchial tube lining. They can be life saving. Corticosteroid medications can be given by inhalation, pill, intramuscular injection or through a vein (IV).

Five types of synthetic corticosteroids are inhaled as sprays: budesonide (Pulmicort), fluticasone (Flovent), beclomethasone (Vanceril, Qvar, or Beclovent), triamcinolone (Azmacort), and flunisolide (AeroBid). These sprays provide the benefits of corticosteroids with less serious side effects. Occasional side effects include:

- Mouth and throat irritation
- Hoarseness
- Thrush (a yeast infection in the mouth or throat)
- Cough

You can decrease the chance of getting thrush by using a spacer and/or by gargling and rinsing your mouth with water after using these aerosols. Generally, aerosol corticosteroids are considered safer than corticosteroid pills or injections. However, if you are using high doses of inhalant you may wish to speak to your physician regarding risks and benefits.

Corticosteroid sprays are not bronchodilators and will not give immediate relief in an acute asthma attack. Their effect on the bronchial tubes comes about more slowly and helps to prevent future asthma attacks. It is important to take these sprays on a regular basis.

Medications available to be taken by mouth include prednisone, dexamethasone (Decadron), Triamcinalone (Aristocort), and methylprednisolone (Medrol).

While corticosteroids taken in pill or injection form are effective in reversing severe asthma, they may cause significant side effects. Side effects from long-term systemic use may include:

- Round face, Thin skin, Easy bruising, Weight gain, Increased appetite
- Increased facial and body hair growth
- Suppression (shrinking) of the adrenal and pituitary glands
- Cataracts, Increased risk of infection, High blood pressure, Diabetes
- Weakening of the bones (osteoporosis), Slowing of growth in children
- Sleep disturbances and emotional problems
- A form of arthritis of the hips (avascular necrosis)

Discuss the use of these medications with your physician. Inhaled corticosteroids generally do not cause these side effects at usual doses.

### **Cromolyn and Nedocromil**

Cromolyn (Intal) and nedocromil (Tilade) are other anti-inflammatory drugs that help prevent narrowing of the bronchial tubes in people with allergic asthma and exercise-induced asthma. They can be inhaled through the mouth and work best if used before exposure to allergens or exercise. These drugs are not bronchodilators and will not help an asthma attack once it is in progress. Cromolyn and nedocromil seldom have side effects.

### **Leukotriene Modifying Agents**

These medicines are taken by mouth and can decrease the number of asthma symptoms if used regularly. They decrease the effects of special messengers called leukotrienes. Singulair and Accolate are most often used and help with exercise induced



Mark E. Bubak, M.D. &  
Julie F. Nielsen, PA-C

2200 W. 49th St., Ste. 104  
Sioux Falls, SD 57105

**605-336-6385**  
*YourAllergyRelief.com*

asthma as well as normal asthma.

### **Long Acting Bronchodilators**

There are two families of these medications. Theophylline is given by mouth and helps open the bronchial tubes for many hours. The beta-agonists such as Serevent and

Foradil are inhaled and last 12 hours. Short acting relievers are used with these drugs as needed.

### **Allergy Immunotherapy**

Allergy immunotherapy is also called desensitization, hyposensitization or allergy shots. It is a form of treatment that can make you less sensitive to allergens. It is helpful for allergic asthma and allergic rhinitis, especially for allergies to trees, grasses, weeds, cats, and dust mites. It can also help with mold or dog allergies. It is generally not helpful for nonallergic asthma, rhinitis or nasal polyps.

Allergy immunotherapy involves regular injections of the allergen(s) to which you are allergic. The injections start with a small dose once or twice weekly and gradually increase to the maximum dose determined by your allergist. Then the injections are extended gradually to monthly doses and continue year-round.

Approximately 70 to 80 percent of people who have allergic asthma or allergic rhinitis benefit from allergy shots. The inconvenience and expense of going to the doctor for immunotherapy must be balanced against the severity of the symptoms, the cost of the other drugs, and the side effects of these other medications.

While it is uncommon, you can have an allergic reaction to the allergy immunotherapy injections. Life-threatening reactions and deaths have occurred, but are extremely rare. You will be asked to wait in your physician's office for 30 minutes following an injection so that if a reaction occurs, it can be properly treated.

After five years, if these injections provide relief from allergy symptoms, consideration can be given to stopping the injections. Most patients continue to enjoy relief for years after stopping the injections. If no benefit is seen after a year, a reevaluation of this therapy is suggested.

### **Experimental**

Many other therapies for asthma are under extensive study. Ask your allergist about other treatment options for your situation.

## **RELIEVERS**

### **Short Acting Bronchodilators**

Bronchodilators open up the bronchial tubes and relax muscle spasms in the walls of the tubes. The main types of short acting bronchodilators are beta agonists and anticholinergic medications.

Beta agonist bronchodilators, also know as adrenergic agents, stimulate the nervous system. Recent studies suggest that, with mild asthma, these drugs should be used only as needed. Sometimes regular use is necessary. They include: albuterol

(Ventolin, Proventil); metaproterenol (Alupent, Metaprel); terbutaline sulfate (Brethaire); isoetharine (Bronkometer); bitolterol (Tornalate); and pirbuterol (Maxair).

Inhaled beta-agonist bronchodilators should not be needed more than four times a day, two puffs each time. Additional use suggests that your asthma is not adequately controlled. This can be dangerous. *If you need to use these inhalers more often, follow your action plan or call your allergist. Another type of medication may be needed to control asthma symptoms.*



Mark E. Bubak, M.D. &  
Julie F. Nielsen, PA-C

2200 W. 49th St., Ste. 104  
Sioux Falls, SD 57105

**605-336-6385**  
*YourAllergyRelief.com*

Some side effects you may experience while using beta-agonist medications are:

- Restlessness or tremor (shaking);
- Palpitations (prominent or rapid heart beat)
- Nausea
- Throat irritation

Call your physician if you experience increased or prolonged side effects.

Anticholinergic medications open the airways by blocking cholinergic nerve impulses. Ipratropium bromide aerosol alone (Atrovent) or with albuterol (Combivent) is often used for maintenance treatment of bronchospasm in chronic obstructive pulmonary disease. This medication lasts three to six hours. It is helpful for some people with asthma. The most common side effect is a dry mouth. It can aggravate glaucoma if sprayed in the eyes.

#### **Oral Steroids**

A short burst of an oral corticosteroid such as prednisone is often used to help relieve worsening of asthma in conjunction with the short acting bronchodilators (albuterol). Typically, this will be for five days. Your action plan may tell you to start this in certain circumstances. As there are many possible side effects, it is limited to only short bursts when truly needed.

#### **Emergency Treatment**

Emergency treatment may not be limited to the above medications. Home emergency kits may include adrenaline in injection form, such as Epi-Pen Auto-Injector.

## **CONCLUSION**

People with well-controlled asthma can exercise, sleep well, and work or play without symptoms of asthma or serious side effects from their medications. However, managing asthma may require some life adjustments such as avoiding certain triggers, self-monitoring with regular use of your peak-flow meter, taking medications, and scheduling regular visits with your allergist. If your asthma is not controlled, discuss this with your allergist. With the help of medical treatments and preventive measures, most people with asthma are able to lead active and fulfilling lives.



Mark E. Bubak, M.D. &  
Julie F. Nielsen, PA-C

2200 W. 49th St., Ste. 104  
Sioux Falls, SD 57105

**605-336-6385**  
*YourAllergyRelief.com*

## PEAK FLOW MONITORING

### Why Do I Need to Monitor Peak Flow?

Recording your peak flow over time helps you:

- Detect subtle changes that may signal obstruction of your airways so you can intervene before you experience signs and symptoms of an asthma attack.
- Evaluate your course of therapy to see if it is effective.
- Determine when emergency care is needed.
- Identify specific asthma triggers.

### How Do I Use the Peak Flow Meter?

*Follow these steps:*

- Stand or sit up straight.
- Slide the indicator to the bottom of the scale to zero.
- Take a deep breath, and then blow as hard and fast as possible with your lips tight around the mouthpiece.
- Note the final position of the indicator. This is your peak flow rate.
- Slide the indicator back to the bottom of the scale and repeat the test twice.
- Record the highest reading of the three attempts.

If your reading is low and you have asthma symptoms, follow your action plan as directed. If your reading is lower than usual, but you have no asthma symptoms, take another reading 30 minutes later. If it is still lower than usual, your asthma may be getting worse. Be alert for symptoms, and follow your action plan.

### What Is My Personal Best Peak Flow?

Your personal best peak flow is the highest peak flow rate you can achieve consistently when your asthma is under control. To determine your personal best, measure and record your peak flow twice daily for a week or two when you have few or no asthma symptoms. The consistently highest rate during that week is your personal best. Determine your zones with the help of your allergist.

My personal best peak flow is \_\_\_\_\_

### Green, Yellow, and Red Zones

Green, yellow, and red zones help you gauge your asthma condition on any given day--from all clear or no symptoms to medical alert or severe symptoms. Your peak flow rate each day will fall into one of the zones, which are based on a percentage of your personal best peak flow. Your personal best peak flow may change. If so, recalculate your green, yellow, and red zones. For example, if you consistently get readings above your current personal best for a week or more, you may need to record a new personal best peak flow and adjust your zones.



Mark E. Bubak, M.D. &  
Julie F. Nielsen, PA-C

2200 W. 49th St., Ste. 104  
Sioux Falls, SD 57105

**605-336-6385**  
*YourAllergyRelief.com*

**Green Zone: All Clear**

No symptoms of asthma. Able to participate in usual activities. No sleep disturbance due to asthma symptoms.

My green zone peak flow is above \_\_\_\_\_ (80 to 100 percent of personal best peak flow). To determine, multiply your personal best peak flow by .80 (80%).

**Action:** Continue with present course of therapy.

**Yellow Zone: Caution**

Symptoms of difficult breathing: chest tightness, wheezing, and frequent, tight cough that interfere with your usual activities or disturb your sleep.

My yellow zone peak flow is between \_\_\_\_\_ and \_\_\_\_\_ (60 to 80 percent of personal best peak flow). To determine, multiply your personal best peak flow by .60 (60%).

**Action:** You may need an increased dose of your current medication. You may need to take a cortisone medication or increase the dose if you already take this medication. Call your physician if you do not have a plan for increasing your medication.

**Red Zone: Medical Alert**

Symptoms: Symptoms may include prolonged shortness of breath that medication relieves only briefly or does not relieve, gasping for air, extreme anxiety due to difficulty breathing, continuous coughing, condition rapidly getting worse and extreme fatigue.

My red zone peak flow is below \_\_\_\_\_ (less than 60 percent of personal best peak flow).

**Action:** Follow emergency plan.

**EMERGENCY PLAN**

If you experience any of the following warning signs, do not "wait out" the attack. Proceed immediately to an emergency room facility.

**Do not drive yourself. If there is no one to drive you, call 911.**

Your peak flow reading remains in the red zone with treatment.

Your asthma is getting progressively worse and there seems to be no great relief of your symptoms 20 minutes after using inhaled bronchodilators.

Your asthma is flaring up and symptoms are similar to a previous asthma attack that was treated at an emergency room or hospital.

You are alarmed by the severity or intensity of your current asthma flare-up.

Other: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_