Living with asthma

Years ago, asthma was a debilitating condition that in many cases seriously limited what a person could do. Fortunately — as a result of greater knowledge about asthma and its treatment options — the ability to manage this disease has vastly improved over the years.

With proper care, today people with asthma live quite normal, active lives. In fact, life with asthma at times can even be extraordinary for Olympic gold medalists or professional athletes who break records — despite their asthma. When you manage your asthma, you can do almost anything you want to do. Throughout this book, you’ll learn how to keep your asthma under control so that you too can continue to lead a healthy, fulfilling life.

Asthma can be different for everyone who has it. What triggers it for one person may not for another.

This guide is not a substitute for medical advice from your physician. Your health care provider can help you develop your own asthma action plan. Bring this book along to your next doctor visit and ask your health care provider to help you complete your personalized asthma action plan on pages 25 through 27. Before long, you can be on the road to successfully managing your asthma.

The word “asthma” is derived from a Greek word meaning “breathlessness” or “panting,” both of which describe symptoms present during an asthma attack.
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1. Understanding asthma

When you breathe, air moves through your nose or mouth down to your windpipe (trachea). Just as the windpipe meets the lungs, it branches off into two large airways (bronchi), one to each lung. Within the lungs, the large airways branch off into smaller airways (bronchioles) leading to many small air sacs (alveoli). These air sacs do two very important jobs. First, they transport oxygen from the air you breathe into your bloodstream. Second, they remove carbon dioxide from your blood so it can be removed from your body when you exhale.

What is asthma?

Asthma interferes with normal breathing by narrowing the airways both within and leading to the lungs. When the airways are narrowed, the amount of carbon dioxide leaving the body and the amount of oxygen entering the body are both restricted. With asthma, one or more of the following situations cause the airways to narrow.

Tightening of the muscles that wrap around the airways. For people with asthma, the airways sometimes overreact to triggers. The result is spasms of the muscles encircling the airways, called bronchospasm. As these muscles contract or tighten, the space inside the airways narrows and less air is able to pass in and out of the lungs.

Inflammation of the airway linings. The same triggers that cause bronchospasm can also cause ongoing (chronic) swelling and inflammation in the inner lining of the airways. Like bronchospasm, inflammation of the lining narrows the space available for air to pass through. When the lining of the airways is irritated and inflamed, bronchospasm is more likely to occur.

Twitchiness of the airways. The airways in a person with asthma narrow in response to triggers such as exercise or cold air. How easily this occurs is often referred to as twitchiness or bronchial hyperreactivity.

Overproduction of mucus. Mucus normally coats the airways and cleans away small particles of foreign matter, such as dust and dirt, from the air passages. When the airways become inflamed during an asthma episode, too much mucus may be produced. The excess mucus takes up space in the airways, blocking the free flow of air. It may also become dry and sticky, further obstructing the airways. As a result, it is more difficult to clear away the mucus by coughing, and bacteria can grow in the mucus, resulting in bronchitis.

Many people with asthma experience times when they have more problems breathing and times when they feel perfectly normal. The times of greater difficulty are called “asthma episodes.” During an asthma episode, you may have sudden coughing or wheezing that can cause you to feel short of breath. Asthma episodes can last from a few minutes to several hours or days.

Fortunately, the airflow obstruction caused by asthma can be reversed, often rapidly. This is one of the key ways in which asthma is different from other diseases, such as emphysema. Sometimes, bronchospasm will simply stop on its own. But more often, medications are needed to prevent and treat asthma episodes. Although there is no cure for asthma, with the help of your health care provider, you can learn to manage this disease so it doesn’t interfere with your daily life.

How is asthma diagnosed?

Asthma symptoms can be different from person to person. For some, the main symptom is a persistent cough. Others may experience wheezing, chest tightness, shortness of breath or any combination of the above.

Asthma tends to run in families (about 40 percent of children who have parents with asthma will develop asthma), and most people who have asthma develop their first symptoms while still young. About half of those with asthma show symptoms before age 10, and most develop it before age 30. But anyone can develop asthma at any age.

Because other illnesses and diseases can cause similar symptoms and difficult breathing, you should see your health care provider to determine whether the problem is asthma or something else. Be prepared to give specific information about when and under what circumstances your symptoms tend to occur.
For example, your health care provider will probably ask you some of the following questions:

- What symptoms are you having (wheezing, coughing with mucus, chest tightness, shortness of breath)?
- When do these symptoms usually occur (during the day or night, at home or at work, after exercise, only during certain seasons of the year or certain weather conditions)?
- How often do you have problems (occasionally, daily, a few times a month, only after a cold or other upper-respiratory illness)?
- Do you have any known allergies?

Your answers to these kinds of questions will help your doctor develop a history of the problem. This history, together with a physical examination, will help your doctor decide if further tests are needed. These may include chest x-rays and spirometry. The x-rays help rule out other possible causes for your symptoms. If no other lung disease is present, chest x-rays will be fairly normal in a person who has asthma.

Spirometry is a test that involves blowing into a device called a spirometer. The spirometer measures the amount and speed of air that is breathed out, indicating how open or narrow the air passages are. When the passages narrow during an asthma episode, the force of exhaled air measured by the spirometer is lower than normal. Some people who have asthma, however, may have normal spirometry results during times when they are symptom-free. This is one way your health care provider can tell that the problem is asthma and not emphysema or chronic bronchitis, both of which are diseases that cause irreversible damage to the lungs.

The asthma spectrum
Asthma can range from very mild and intermittent to severe and persistent, with a wide spectrum in between. Your grade of asthma depends on your daytime and nighttime symptoms, and your breathing test results. Each level of asthma requires a different approach to treatment. The severity of your asthma can change over time, depending on how your body reacts to different triggers at different times in your life. You may have periods when your asthma flares frequently; at other times in your life, you may have few problems.

If you are the parent of a child who has asthma, keep in mind that about half of all children with asthma “grow out” of the disease and have lessening symptoms by the time they are 15 years old. Some of these individuals, however, may develop symptoms again later in life.

The key to managing asthma is understanding your symptoms and learning what triggers and relieves them. These topics will be discussed further in the next chapters.

Why me?
Many people think asthma is a disabling disease — something that makes you unable to participate in sports, be active or enjoy life. Though asthma has had this reputation in past years, it just isn’t true today. With medications, asthma can be controlled so it doesn’t interfere with leading a normal, active lifestyle.

This is not to say it will be easy for you to adjust to having asthma and to the things you need to do to take care of it. Learning that you have a chronic disease such as asthma can raise a variety of emotions — some not so pleasant. You may feel angry, frustrated or worried about what your future will be like living with asthma. You may wonder why this had to happen to you. Just remember that all these feelings are perfectly normal. These feelings usually pass as time goes by and you become more comfortable and confident that you really can manage this disease and prevent and treat asthma episodes. If you continue to struggle with feelings of frustration, anger, worry or fear, or if these feelings are interfering with your daily life or relationships, talk with your health care provider. He or she may be able to recommend a counselor or other mental health professional who can help you.

Family, friends, co-workers, teachers and coaches can also provide valuable support if they understand asthma. Share what you know about asthma with the people who care about you, and let them know how they can help you if you have an asthma episode. You might even want to lend them a copy of this guide.
2. Tracking asthma triggers

Most people don't regularly pay attention to the way their bodies react to things around them. Becoming aware of your body's response to different environments and materials, however, can be an important strategy for managing your asthma.

For most people, asthma episodes are regularly triggered by one or more factors — allergens, infections, irritants, weather conditions, exercise, emotions or even aspirin products. What causes an asthma episode in one person, however, may not bother another person who has asthma. The first step in managing your asthma is identifying your asthma triggers and finding ways to avoid them as much as possible.

Allergens

Your immune system is designed to protect your body from harmful intruders such as bacteria and viruses. When one of these intruders, or antigens, enters the body, the immune system kicks in by releasing special chemicals to combat the invaders.

- What triggers asthma for one person may not for another
- Those who live in the inner city have an increased risk for developing asthma (Source: National Institute of Allergy and Infectious Diseases)
- Asthma tends to flare most often at night, in the early morning hours or after exposure to a trigger

If you have a bacterial or viral infection, these may cause your body temperature to rise or your nose to run as a way of ridding the antigen from the body.

In some people, the immune system can also react when the body is exposed to certain antigens, such as dust mites or pollen, that are not normally harmful to the body. These antigens are called allergens, and the immune system's overreaction is called an allergy. Allergic reactions affect specific areas of the body:

- The skin — with rashes, itching, eczema or hives
- The nose — with runny nose, congestion or sneezing
- The eyes — making them itch, swell or become watery
- The airways — causing asthma

Different allergens cause different allergic reactions in different people with allergies. A food allergen, such as eggs or peanuts, may cause a person with that specific allergy to break out in hives. On the other hand, an airborne allergen, such as animal dander, pollen, mold or dust, may cause a runny nose or itchy eyes. For some people, the allergic reaction to specific allergens is an asthma episode.

Asthma and allergies often go hand-in-hand, but having one of these conditions does not necessarily mean you have or will develop the other. (Although an estimated 95 to 98 percent of children with asthma have nasal allergies, only 40 to 50 percent of adults with asthma have nasal allergies.) If you do have both, however, your allergies may be triggering your asthma.

Allergies that trigger asthma

The first clue that you may have an allergy is if you regularly experience allergy-like symptoms in specific situations. For example, maybe you have allergy symptoms only at certain times of the year or when you visit a home where a cat or dog lives. Maybe you have year-round symptoms, indicating that you might be allergic to something in your home, such as dust mites or molds.

Allergies can develop slowly with repeated exposure to an allergen over time. For example, a person who grew up on a maple-lined street may be well into adulthood before developing an allergy to maple pollen. Even though they may have taken months or years to develop, allergies may seem to pop up overnight. Common allergens to consider as you search for your asthma triggers include the following:

- Animal and insect allergens. Cats, though perhaps the most frequent culprits, aren't the only sources of animal allergens. Dogs, horses, guinea pigs, birds — just about any furry or feathered friend — may also trigger allergic reactions in some people. Allergens may be found in animal dander (similar to dandruff), saliva or urine. Reptiles and fish are about the safest pets for people prone to animal allergies. In addition to pets, household pests such as cockroaches may serve as allergens.
Seasonal allergens. These primarily include pollens. Tree pollens are most abundant during the spring, grasses in the spring and summer, and weed pollens, such as ragweed, in late summer and fall. Seasonal allergens vary with geographic regions.

Household allergens. Dust mites (microscopic insects found in household dust) and fungi (mold and mildew) can cause year-round allergy symptoms. Dust mites and fungi especially like to breed in damp places and humid environments, such as the bathroom, basement and kitchen. Warm, humid weather can also contribute to higher household allergen levels.

If you think you may have allergies, talk with your health care provider. He or she may recommend that you see an allergist (a doctor specializing in allergies) for allergy testing. During an allergy test, very small amounts of allergens are placed on (a “scratch test”) or injected under your skin. If your skin reacts with redness or a raised, itchy bump where the allergen was placed, you are allergic to that allergen.

Treating allergies to manage asthma

Once you know what, if anything, you are allergic to, you can use an asthma diary to see if your asthma episodes seem to be connected with your allergies, as identified by skin testing. If they are, the first and most important step for controlling both your allergies and your asthma is to find ways to avoid those things to which you are allergic.

Avoiding allergens isn’t always easy. Your health care provider can give you more information on how to minimize your exposure to specific allergens. You may find some suggestions very practical and others nearly impossible given your personal circumstances.

If you can’t make your entire house “allergen-free” (keep in mind that no home is ever entirely free of allergens), focus your efforts on the bedroom, which is the most important room of the house because you spend six to 10 hours a day there.

Reducing allergens in your home

Here are a few things you can do

- Encase the mattress and pillows in allergen-free covers to help reduce dust and dust mites in the bedding; some mattress encasings are made with microfiber fabric to prevent excess heat and moisture
- Opt for bare floors or easy-to-clean area or throw rugs instead of wall-to-wall carpeting
- Keep pets out of the bedroom at all times (if possible, keep pets out of all living areas of your home)
- Dust and vacuum regularly
- Don’t use feather pillows or genuine down comforters
- Take a quick shower before bed to rinse off any pollens or mold spores on your body and prevent prolonged exposure to allergens while sleeping
- If you don’t have central air conditioning, install a window air conditioner during the warm seasons to avoid the need for open windows (which allows more pollen in from outdoors) and to help reduce humidity; if you have central air conditioning, keep windows closed to help prevent pollens and mold spores from entering the house; air conditioning lowers indoor humidity levels, which decreases the mite population
- Avoid hanging clothes to dry outside, where they can be exposed to pollens and mold
- Take precautions in your basement, which tends to have higher humidity levels; avoid putting carpeting on a cement slab floor and having bedrooms in basements
- Don’t use humidifiers or vaporizers in the bedroom; they provide an optimal environment for molds and dust mites
For many people with allergies, medications provide important prevention and relief of symptoms. If your asthma is triggered by allergies, taking your allergy medications as directed can help prevent or reduce the severity of asthma episodes. In some cases, immunotherapy or “allergy shots” are used to desensitize the immune system to certain allergens.

**Infections**

Bacterial and viral infections are another common asthma trigger. Viral infections, such as colds and flu, tend to trigger asthma episodes more frequently than bacterial infections, such as strep throat or sinus infections. Though these types of infections mostly affect the upper airways in the nose, throat and sinuses, the lower airways may also become irritated if you have asthma.

For some people, their first asthma episode comes during or shortly after having bronchitis or pneumonia. While these asthma episodes can last several weeks or even months, they may not occur again. Some people, however, may develop ongoing asthma problems.

**Avoiding trigger infections**

- Keep healthy with nourishing foods, lots of fluids, regular exercise and plenty of sleep
- It may be impossible to prevent getting a cold, flu or other upper-respiratory infection entirely
- Avoid close contact with those who have colds or flu, especially during the first few days of illness
- Wash your hands regularly
- Ask your doctor if you should get a flu shot in the fall of each year; remember that flu immunizations provide protection against the strains of influenza present that year only and must be repeated each fall

Viral infections generally must take their own course. Antibiotics have no effect on viruses. Using a decongestant, however, may help relieve stuffiness and congestions that can irritate your asthma.

Viral infections can also cause a cough. But because coughing can also be a symptom of an asthma episode, you don’t want to mask the asthma by using a strong cough suppressant. If you need relief from a nagging cough, you may use an over-the-counter cough medicine containing dextromethorphan, but be sure you are also taking your asthma medications as prescribed. Drinking lots of clear liquids (water and juices) is the best medicine for loosening mucus in the airways so it is easier to cough up and clear away.

If colds or flu tend to trigger your asthma, your health care provider can recommend asthma medications to begin taking early during the viral infection to help prevent an asthma episode. Call your health care provider for advice if cold symptoms:

- Worsen after three to five days
- Don’t improve and remain bothersome after seven days
- Are not resolved after 14 days

You should also call for advice if your asthma flares up with the cold or if you are coughing up colored mucus from your chest. For colds in children, call for advice if fever persists and cold symptoms are very bothersome after three days.

**Irritants**

Asthma symptoms are aggravated by many factors, both outdoors and indoors. These irritants are different from allergens because they do not trigger the body’s immune system as allergens do — they simply irritate the airways.

Examples of irritants include:

- Smoke from tobacco or wood
- Various dirt particles in the air
- Extremes or sudden changes in weather, including temperature, barometric pressure, or humidity
- Air pollution
- Fresh flowers
- Fumes and fragrances from a variety of products
Avoiding irritants

You will probably find that some of these irritants trigger your asthma, while others do not. You’ll also notice that some are easier to avoid than others. As with allergens, you can use an asthma diary to help you identify which irritants, if any, tend to trigger your asthma.

Tobacco smoke is a particular concern, especially in homes with children who have asthma. Studies have shown that very young children who live in homes where someone smokes are more likely to develop asthma and to have asthma episodes that require emergency room care. School-age children also have more school absences if parents or other members of the household smoke. In addition, smokers themselves are known to develop more frequent upper-respiratory infections.

Make your home off-limits to smoking. When reserving a hotel room, request a non-smoking room.

Cold air may irritate the lungs of some people with asthma. Short of packing up and moving to Arizona, those with asthma can prepare for fluctuations in the weather by dressing appropriately. In very cold or windy weather, wear a scarf or face mask over your mouth to ward off cold blasts.

Outdoor air pollution is an irritant you can’t totally avoid, but you can lessen its impact by rolling up your car windows or closing up the house and turning on the air conditioning. Watch the weather reports, and avoid strenuous outdoor activities on days when the pollution level is high.

Exercise

In years past, exercise-induced asthma led people to believe that those with asthma could not participate in sports or physical activities. We now know that by carefully choosing activities and using pretreatment medications when needed, people who have asthma can be just as physically active as anyone else.

The most common activities that can cause an asthma episode are aerobic activities, such as jogging or cross-country skiing, which involve continuous movement sustained over a long period. During those kinds of activities, air is breathed in through the mouth. This air is colder and drier when it reaches the lungs than air that is inhaled through the nose. In those with exercise-induced asthma, the colder, drier air acts as an irritant to the lower airways, causing them to spasm.

Not all sports or exercise involve this kind of continuous, sustained movement. Football, baseball and tennis are examples of sports involving shorter sprints. Brisk walking can provide aerobic exercise without the need to breathe through the mouth. Swimming is often recommended as one of the best aerobic activities for people who have asthma. Though it does involve breathing through the mouth, the surrounding water tends to humidify the air, making swimming less likely than other activities to trigger asthma.

If you choose to jog or participate in activities that can trigger your asthma, ask your health care provider to recommend pretreatment medications to avoid asthma episodes, then allow yourself an adequate warm-up period.

Pay attention to your body’s reactions to exercise. Exercise-induced asthma can occur either during or after exercise. Be sure to have appropriate medications available in case you have an asthma episode.

Aspirin and other anti-inflammatory medications

- Aspirin and other non-steroidal anti-inflammatory drugs (NSAIDs) act as triggers in a small percentage of people with asthma. Because aspirin-induced asthma episodes can be severe and come on very quickly, you should avoid taking aspirin and other NSAIDs if you have aspirin-sensitive asthma.
- Ibuprofen (Advil®, Motrin®, Nuprin®) and naproxen (Aleve®) are other NSAIDs that are available without prescription. A variety of other over-the-counter medications contain aspirin. Read labels carefully, or ask your pharmacist before taking any non-prescription medication, especially pain relievers and cold remedies. Choose products containing acetaminophen (Tylenol®) for treating fever or pain, such as headaches.
Emotions
Excitement, stress, fear and other emotions — even laughter — are said to trigger asthma episodes in some people. In reality, however, the emotions themselves are not the direct trigger; rather, the asthma episodes occur as a result of more rapid or heavier breathing brought on by crying, laughing or feeling anxious. So even when emotions are involved, asthma is still a physical disease.

Stress management techniques
Practicing stress management techniques can be an effective way of reducing asthma episodes triggered by emotional upset. Both techniques involve deep diaphragmatic breathing (breathing from the diaphragm, so your abdomen — not your chest — moves in and out).

In addition to promoting relaxation, these techniques are useful during asthma episodes to help you get more air while waiting for medications to begin working. You will be able to use these techniques best during asthma episodes or times of emotional upset if you practice them regularly during non-stressful times.

Relaxation techniques
Here are some specific techniques that can aid in relaxation and stress management. The more you practice these relaxation techniques, the more they can help reduce asthma episodes.

Daily practice, especially at first, will help make these relaxation techniques become second nature for you. When this happens, it will be even easier for you to use the techniques when you need them most — during an asthma episode or when you are under a lot of stress. Parents can coach their children through these exercises and encourage them to use them if they feel an asthma episode beginning.

A written asthma management plan can also offer reassurance and confidence for people with asthma. Sometimes, fear can intensify an asthma episode. Just knowing that you can effectively treat the episode and continue to breathe can help prevent an episode from worsening because of fear.

Technique 1: Quieting response
1. Sit comfortably.
   (You can also learn to do this while standing, such as waiting in line, or just before an anticipated stressful event.)

2. Draw in a deep breath through your nose, and hold it for five seconds (count to five slowly). Exhale slowly through your mouth, and tell all your muscles to relax. Repeat this two or three times to become more completely relaxed.

3. If circumstances permit, imagine a pleasant thought (“I’m able to relax and let go throughout the day”) or a pleasant scene (a calm lake or a mountain stream).

The quieting response technique takes from 30 to 60 seconds.

Technique 2: Deep breathing
1. Choose a quiet spot, and get comfortable.

2. Gently blow out all the air in your lungs.

3. Slowly count to eight while inhaling through your nose (count “1-and-2-and-3-and,” to eight). Then hold your breath, again to the count of eight. Finally, slowly exhale through your mouth while counting to eight.

4. Resume slow, rhythmic breathing for a few minutes. The in-and-out cycles should be equal in length. Go deeper than shallow, upper-chest breathing. If you are breathing as you should from your diaphragm, your chest should barely move, but your abdomen will expand and contract.

5. Repeat the whole process again.
### Using what you know about triggers

Managing asthma triggers is the most effective approach for preventing asthma episodes. Once you know what triggers your asthma, you can begin to find ways to avoid triggers.

#### Asthma trigger checklist

Think about what triggers your asthma. Put a check mark next to the items that affect you.

<table>
<thead>
<tr>
<th><strong>Allergic triggers</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>_ House dust (dust mites)</td>
</tr>
<tr>
<td>_ Seasonal allergens – pollens from trees, grass, ragweed or other plants</td>
</tr>
<tr>
<td>_ Mold outdoors, mildew indoors</td>
</tr>
<tr>
<td>_ Animals</td>
</tr>
<tr>
<td>_ cats</td>
</tr>
<tr>
<td>_ dogs</td>
</tr>
<tr>
<td>_ rodents (hamsters, guinea pigs)</td>
</tr>
<tr>
<td>_ birds</td>
</tr>
<tr>
<td>_ Other</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Irritants</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>_ Tobacco smoke</td>
</tr>
<tr>
<td>_ Weather conditions – extremes or sudden changes in temperature, barometric pressure or humidity</td>
</tr>
<tr>
<td>_ Air pollution</td>
</tr>
<tr>
<td>_ Indoor pollution (smoke from fireplaces or wood-burning stoves; fumes from building products, carpeting, paint; etc.)</td>
</tr>
<tr>
<td>_ Outdoor pollution (smog, car or truck exhaust, etc.)</td>
</tr>
<tr>
<td>_ Fragrances or fumes from various products:</td>
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</tbody>
</table>
3. Monitoring your asthma

The goal for those with asthma should be to live like everyone else, without asthma getting in the way of life’s wonderful possibilities. A good asthma management plan should be able to reduce the severity and frequency of asthma symptoms, as well as prevent unscheduled visits to the doctor or hospital.

Your health care provider can teach you asthma self-care techniques. Work with him or her to develop a management plan that’s best for you. You will know your plan is working if it helps you achieve the following asthma-management goals:

- Reduce the severity and frequency of asthma symptoms
- Alleviate nighttime awakenings
- Allow for fuller activity
- Prevent unscheduled visits to the doctor or hospital

Most asthma management plans include the following elements:

- Watching for early warning signs by monitoring symptoms or using a peak flow meter to measure lung function
- An asthma diary to record peak flow readings, asthma episodes and circumstances surrounding asthma episodes
- Appropriate medications for preventing and controlling asthma episodes
- Guidelines for when to call a health care provider

Your health care provider will teach you how and when to take medications and help you identify your asthma triggers and ways to avoid them. By reading this guide, you’re already off to a good start. Learning self-care techniques, including when and how to use medications, puts you in control of your asthma.

Just as fingerprints are different from person to person, so is asthma; your symptoms and treatment plan may be different from someone else’s

Asthma episodes range from mild to severe and can last from a few minutes to a few days

When your asthma is well controlled, you can live a healthy and active life

Using a peak flow meter

A peak flow meter is a good tool for assessing and monitoring asthma. This inexpensive, hand-held device measures the maximum or “peak” speed at which air can be exhaled from the lungs. During an asthma episode, the peak flow is slowed because the airways are constricted and partially blocked.

As early as 24 hours before asthma symptoms appear, your breathing capacity may already begin to drop. The peak flow meter can detect this drop so that you can start taking appropriate medications before wheezing or coughing even begins. But not everyone who has asthma needs to use a peak flow meter. Some people are very good at recognizing early signs of asthma episodes and treating them appropriately.

Early detection of an asthma episode can also make it easier to identify your asthma triggers. For example, a weather change or a visit to a home with a pet on Saturday afternoon may be the trigger behind an asthma episode but if you don’t notice any asthma symptoms until Sunday, it may be more difficult to
draw the connection between the cat or the weather change and your asthma. A routine peak flow measurement taken on Saturday, however, may make it easier to identify the real trigger. Peak flow meters can help you recognize triggers that otherwise might be overlooked.

Even some children as young as three years old can learn to use a peak flow meter. Your health care provider may initially recommend that you take a peak flow meter reading two or more times a day. Usually the readings are taken right after waking up in the morning and again before going to bed. You may also be asked to take a breath before and after taking inhaled medications. Your doctor can help you determine the best testing times for you.

**Peak flow zones**

Peak flow readings are divided into three zones — green, yellow and red — like a traffic light. Readings in the green zone mean you are doing fine, while readings in the yellow zone mean your asthma is not well controlled and you should take medications as prescribed in your asthma action plan. Readings in the red zone mean a severe asthma episode is under way and you should call your health care provider or seek immediate medical attention.

The exact ranges of these zones vary from person to person. Height and age are factors, and the best possible peak flow readings vary somewhat between men and women and among different ethnic groups.

Your health care provider will help you determine your “personal best” peak flow and then use this number to establish the three zones of your asthma action plan. Green (all clear) represents 80-100 percent of your personal best reading; yellow (caution) indicates 50-80 percent of your personal best; and red (danger) shows below 50 percent of your personal best. Once these zones are established, your doctor can recommend an asthma action plan specially tailored to your needs. Asthma action plans will be discussed in detail in Chapter 5.

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**Steps for using the peak flow meter**

1. Move the pointer to the base of the numbered scale.
2. Hold the peak flow meter, being careful not to block either the mouthpiece or the air exit.
3. Stand up.
4. Take a deep breath.
5. Place the meter in your mouth, closing your lips gently around the mouthpiece.
6. Blow out as hard and fast as possible. (The device measures the maximum speed of your expiration, not how much air you exhale. A short and fast blow gives the best reading.)
7. Write down the number indicated by the pointer.
   1. Repeat steps 1 through 7 two more times (unless the test has provoked a coughing attack).
   2. Record the highest of the three numbers achieved. This is your peak flow reading.
If your child has asthma

Children, too, can be involved in their own asthma care, learning to watch for early symptoms and taking their own peak flow meter readings. However, until your child is old enough to accurately keep an asthma diary and follow an asthma action plan unassisted, you will need to take special care in monitoring, treating, and recording symptoms and peak flow readings.

In addition to the common warning signs described in this chapter, watch for wheezing during the night. Increased amounts of mucus production in the airways may produce coughing and wheezing in a sleeping child. Your child may need to use his or her inhaler or nebulizer during the night. When asthma is properly managed, however, there should be no nighttime asthma symptoms.

Talk with your child’s teacher or daycare provider about asthma. Let them know what symptoms to watch for. Make sure the day care provider, teacher and the school health office have copies of your child’s asthma action plan. Also be sure your child has a separate supply of medications that is kept in a readily accessible place at school or daycare.

Keeping an asthma diary

One of the most important steps in managing persistent asthma is to keep a daily written record, or asthma diary, that shows peak flow meter readings, medications taken, asthma symptoms and possible triggers.

By keeping a daily written record of your symptoms and peak flow readings, you can begin treatment earlier and reduce the number and severity of asthma episodes. Your doctor may also use the information recorded in your asthma diary along with peak flow readings taken in the office to determine whether your medications are doing the job.

The information you record in your asthma diary is important for developing an asthma action plan that meets your individual needs. An asthma diary can also help you identify possible asthma triggers you may not have been aware of before.

Keep your asthma diary in a safe, accessible place, and take it along on each visit to your health care provider.

A sample asthma diary is shown on page 40.
4. Getting the most from asthma medications

There is no “cure” for asthma. However, medications can prevent and control symptoms. Most people with asthma can lead normal, healthy lives.

Each person’s asthma is unique. In the same way, ways to treat asthma must be targeted to each person’s needs. Some people with asthma take medicine daily. Others take it only as needed.

Asthma is classified by the severity of your symptoms and breathing test results. The most common is mild intermittent asthma. Persistent asthma can be mild, moderate or severe. The type and amount of medicine is matched to the severity. The treatment first gains control of the asthma symptoms. Then it keeps control with the minimum effective dose.

Learning about your medications will help you to use them safely and effectively. You should know what they do and how they work. You should learn when to take them and any side effects. Taking them as directed is essential. Work with your health care provider to tailor a program to your needs.

How asthma medications work
Many medications are used for asthma. Your doctor prescribes for the severity of your asthma. Many with mild intermittent asthma can manage well with a quick-relief drug. Most people with frequent episodes or persistent asthma take at least two drugs. One is for quick relief during an episode. It relaxes the muscles of the airways. The other is for long term control. It is taken daily to prevent inflammation and mucus production.

You should know which medication is for which purpose. You must take your daily long-term medication to manage your asthma. But this will not give relief during an episode. For that, you need a quick-relief medication.

Asthma cannot be cured, but it can be managed. Remissions (or periods with no symptoms) may occur.

Most people with asthma need to be seen by their doctor at least once a year.

Some over-the-counter drugs can cause bad reactions if taken with asthma drugs. Check with your doctor or pharmacist before taking other drugs.

Long-term control medications
The best way to control an asthma episode is to prevent it. Many types of medications are used for long-term control. Anti-inflammatory drugs work to prevent mucus production and airway swelling. They do not give fast relief of asthma symptoms. They do help control asthma with regular use. To work, they must be taken daily — even on days when you feel fine.
**Inhaled corticosteroids**

Inhaled corticosteroids are the most potent and effective long-term drug. They reduce swelling in the airways. They reduce asthma episodes and the need to go to the hospital. They increase breathing test results. They reduce airway twitches. They may prevent damage to the airways. Regular daily use is key. It can take five to seven days before they begin to work.

There are many kinds and strengths. The dose may vary with the product used. Usually they are taken one to two times per day.

One type of inhaled corticosteroid is a nebulized form. It is called budesonide. The brand name is Pulmicort Respules®. It often helps children who have persistent asthma.

Minor side effects from inhaled steroids may be hoarseness and thrush. Thrush is a yeast infection in the back of the throat and tongue. This can be reduced by using a spacer with the inhaler. It also helps to rinse the mouth with water or gargle with mouthwash after use. Inhaled corticosteroids help many people reduce their need for oral corticosteroids. These can have more serious side effects, such as reduced growth, osteoporosis, cataracts and glaucoma.

**Long-acting beta agonists**

Long-acting beta agonists can be inhaled or oral. Inhaled salmeterol and formoterol fumarate (Foradil®) can help you breathe better for about 12 hours. They are usually used with an inhaled corticosteroid for long-term control. Inhaled beta agonists are the preferred type. They have fewer side effects. They last longer than sustained-release albuterol tablets.

**Inhaled steroids combined with long-acting beta agonists**

Advair is a combination of fluticasone propionate (Flovent®) and salmeterol (Serevent®). It comes in three strengths: 100/50, 250/50, 500/50. Symbicort is a combination of Budesonide and Formoterol. It is available in 160/4.5 and 80/4.5. Dulera is a combination of Monetasone and Formoterol. It comes in two strengths: 200/5, 100/5.

**Leukotriene modifiers**

Leukotriene modifiers are another way to control asthma. Leukotrienes cause tightening of the bronchi and increase mucus. Zafirlukast (Accolate®) and montelukast (Singulair®) are oral drugs that block the actions of leukotrienes. They are used in adults and children. They can be used alone or with inhaled corticosteroids.

---

**Inhaled corticosteroids**

- Beclomethasone dipropionate (QVAR®)
- Budesonide (Pulmicort Turbuhaler®, Pulmicort Respules®)
- Flunisolide (AeroBid®, AeroBid-M®)
- Fluticasone propionate (Flovent®, Advair®)
- Triamcinolone acetonide (Azmacort®)
- Mometasone furoate (Asmanex)

**Long-acting beta agonists**

Inhaled

- Formoterol fumarate (Foradil®)
- Salmeterol (Serevent Diskus®)

Oral

- Extended-release albuterol (many brands)
**Cromolyn sodium and nedocromil (mast cell stabilizers)**

Cromolyn sodium and nedocromil are called mast cell stabilizers. Cromolyn sodium (Intal®) is inhaled. It keeps the airways from getting inflamed. It is used to control mild to moderate allergic asthma. It is taken through an inhaler or nebulizer. It may be used all year or only in some seasons.

Cromolyn sodium also helps control asthma set off by exercise or cold air. For these cases, it is taken just before exercise or exposure to cold air.

Nedocromil (Tilade®) is a non-steroidal drug like cromolyn sodium. It is used with an inhaler for mild to moderate persistent asthma. Both of these drugs can take two to six weeks of use before they begin to work.

**Theophylline**

Theophylline is a methylxanthine drug that keeps airways in the lungs relaxed and open. It can take up to several hours to work. It is not used for treating episodes that are already under way. It is used less often than inhaled corticosteroids.

Theophylline comes in a variety of forms and strengths. Capsules are a convenient form for young children. They can be opened and mixed with foods such as yogurt.

Theophylline can produce side effects. These may include headache, nausea, vomiting, stomach cramps, diarrhea, insomnia, fast heartbeat and restlessness. These can be a sign that your dose is too high. If you have any of these, talk with your provider. He or she may use a blood test to check your level of theophylline. If it is too high, your doctor will adjust your dose or change the product.

Theophylline can interact with other drugs. Talk with your doctor or pharmacist before taking any other drugs — prescription or over-the-counter. Never adjust your dose on your own. Taking less than the prescribed dose or skipping doses can lead to an asthma episode. Taking more than the prescribed dose can lead to serious side effects. These may include seizures.

**Anti-IgE therapy**

Anti-IgE therapy [with omalizumab (Xolair®)] has been approved by the Food and Drug Administration. This is an injection given every two to four weeks. It decreases the amount of allergic antibody. It has been shown to reduce asthma flares and the need for other drugs. It also reduces allergic rhinitis (hay fever).

**Quick-relief medications**

Epinephrine is often used in emergency rooms for asthma attacks. (It is also called adrenalin.) It gives fast relief by causing the airways to open, restoring a free flow of air. It is not recommended for regular use. It can increase the heart rate. It should only be given by a health care professional.
**Short-acting bronchodilators**

Other drugs called bronchodilators work much like epinephrine, but are safer. They also work by relaxing the muscles to let the airways open up and make it easier to breathe.

Inhaled short-acting beta agonists are the most common family of bronchodilators. They work fast and are easy to use. They have few side effects and can be targeted to the lungs. They are used to give fast relief during an asthma episode. They come in tablets, syrups, metered-dose inhalers (MDIs) and nebulized solutions.

When used with an inhaler, the beta agonist goes right into the airways to ease the spasm. Relief begins within 5 to 15 minutes. It lasts for about 4 to 6 hours. Long-lasting beta agonists are not “rescue” inhalers. They should not be used for relief from an episode.

MDIs can be carried in a pocket or purse for use when coughing or wheezing starts. Beta agonists in syrup, tablet and nebulizer forms can be used with young children and for others who cannot use an inhaler.

The syrup and tablet forms work more slowly than the inhaled. They can also have more side effects. Still, they may be more convenient for those with few asthma episodes.

Beta agonists may have side effects. Proper inhalation is key to ensure that the medication gets to the lungs. (See the section on inhalers later in this chapter.) In most cases, inhalers should not be used more than two puffs every four to six hours. If you need more relief than this, talk with your doctor. You may need a different drug. Overuse of beta agonists is a sign of asthma that is not controlled. It increases the chance for side effects. These may include fast heartbeat, jitters or headache.

---

**Commonly prescribed short-acting beta agonists**

- Albuterol (Proventil®, Ventolin®)
- Levalbuterol (Xopenex®)
- Metaproterenol sulfate (Alupent®)
- Pirbuterol acetate (Maxair®)

**Anticholinergics**

Anticholinergics are a type of cough suppressant. They block signals in the nervous system that tell the body to cough. Ipratropium bromide (Atrovent®) is an inhaled medication. It offers fast relief from acute episodes. It is most often used with a beta agonist to relieve coughs or for dilation of the bronchi. It begins to work within 30 minutes after it is taken. Combivent® inhaler and DuoNeb® nebulizing solution are combined beta agonist and anticholinergic products.
Oral corticosteroids

Oral corticosteroids are the strongest asthma drugs. They are mainly used for those with severe asthma. They are also used to give fast relief from severe episodes. They begin to work within 8 to 12 hours of the first dose. They come in tablet or liquid forms. They manage asthma very well for short periods when other drugs do not work.

Side effects from short-term use (three to 10 days) are unusual. Side effects may include weight gain, fluid retention, mood changes, muscle pain, sleep issues and stomach aches. Most symptoms go away when the drugs are reduced or stopped. These drugs should be taken with food to prevent an upset stomach. They should be used only with supervision by your health care provider.

Long-term use of oral corticosteroids is avoided due to possible side effects. People who have severe asthma that cannot be controlled with other drugs may need to take them for longer periods. This should be done only with supervision by your provider. Your provider can give you a dose that lowers the risk of side effects. This may mean taking the drugs every other morning. You may need to take other steps to avoid any side effects. (For example, postmenopausal women may need to take 1,000 to 1,500 mg of calcium and 400 units of vitamin D per day to prevent osteoporosis.)

Oral corticosteroids used for asthma control are not the same as anabolic steroids used by some athletes. Oral corticosteroids are synthetic replicas of the steroids made in the body by the adrenal gland. Anabolic steroids are male hormones. They have a different effect in the body than oral steroids.

Other medications

Inflammation and mucus in the sinuses, nasal passages and throat can affect the small airways in the lungs. So drugs to relieve these symptoms can also help your asthma. Allergic rhinitis (hay fever) causes congestion, runny nose and other symptoms. Mild cases can be treated with antihistamines and decongestants. Nasal corticosteroids may also be used. These are similar to inhaled corticosteroids but are used as a nasal spray. In severe cases, some of the asthma drugs may be prescribed.

Get the most from your medications

- Know what each medication you take is supposed to do. Know how much to take and how often.
- Ask your doctor or pharmacist about side effects and how to minimize them.
- Be sure to know if one medication should be taken before another.
- Follow all instructions with care. Take the medicine as directed by your doctor.
- Follow all directions for devices such as nebulizers or inhalers with spacers.
- Be prepared. Don't run out of medications. Always have an extra supply on hand.
- Ask your provider if you should keep oral corticosteroids on hand for severe episodes.
- Asthma symptoms may change over time. Tell your doctor about any changes. The doses may need to be adjusted.
- Ask your doctor or pharmacist to check all new drugs for interactions with ones you are taking.
Administering asthma medications
You need special equipment for inhaled medications. Sometimes this is the container in which the drug is packaged. Other items, such as spacers or nebulizers, may be needed. Below are the systems for delivering inhaled drugs to the lungs.

Inhalers

Metered-dose inhalers
A metered-dose inhaler (MDI) is a small, portable canister. It delivers a measured amount of medication. Proper technique and, in most cases, use of a spacer are needed to ensure that medication gets to the lungs. The common errors people make when using inhalers are:

- Poor timing between activation of the MDI and inhalation. (An example is exhaling instead of inhaling at the moment the medication is released.)
- Inhaling too rapidly
- Not holding your breath briefly after inhaling.
- Not keeping the inhaler clean

MDIs may not work properly if cold. If your MDI is exposed to cold, warm it in your hands before using.

Be sure the inhaler has medicine in it before you use it. If you use the same dose every day, you can calculate how long it will last. A canister with 200 doses will last 25 days if you use four puffs twice a day. (200 doses ÷ 8 puffs/day = 25 days.) Shaking the container is not a good way to tell if any medicine is left. Aerosols may be in the canister even after all the medicine is gone. Always keep an extra inhaler handy so you are sure not to run out.

You need to keep your inhaler clean. To prevent clogging, rinse your inhaler daily. Keep the cap on when not in use. Wash your inhaler (except Intal® and Tilade®) once a week in warm water with a mild dish detergent.

Nebulizers.
Children too young to operate an inhaler are often treated with a nebulizer. This device is also ideal for adults who have problems using MDIs. It is also used for those with severe and erratic asthma episodes.

Nebulizers use compressed air to turn liquid medication into a fine mist that is breathed in through a mask or mouthpiece. It may be used for bronchodilators, cromolyn sodium or the corticosteroid budesonide (Pulmicort Respules®).

Nebulizers are usually used in doctors’ offices and emergency rooms. They can also be purchased for home use. A home nebulizer can help prevent a trip to the hospital. Many types of nebulizers are used. They range from small battery packs to units that plug into a wall socket.

When using a nebulizer at home, be sure to follow your doctor's directions. Nebulizers should not be overused or underused. The nebulizer cup and mask or mouthpiece should be rinsed out and air-dried after each use. Wash with soft water if possible.

New devices.
Many new devices for asthma drugs have come out in the last 10 years or so. They continue to develop new devices. The Turbuhaler® and Diskus® are among the most recent. These use inhaled powders. Your doctor can tell you about more options if an MDI or nebulizer does not meet your needs.
Spacers
If you use an MDI, you will probably also need to use a spacer. The spacer extends the space between the inhaler and your mouth. Examples of spacers are the AeroChamber®, InspirEase® or a plastic tube. Spacers make using inhalants easier. They let more of the drug get deeper into the lungs. Without a spacer, inhaled drugs tend to spray to the back of the throat and go no farther. Spacers are important in preventing thrush. Thrush is a yeast condition that can be caused by inhaled corticosteroids. If your inhaler makes you cough, talk with your doctor.

How to use an inhaler

To be sure you are using your metered-dose inhaler correctly, stand in front of a mirror and follow the steps below. If at any time fog comes from the mouth when inhaling or exhaling, the medication is not reaching the lungs. It is also wise to demonstrate your inhaler technique to your health care provider regularly to be certain you are doing it properly.

1. Shake the container well before using. Remove the cap, and hold the container upright.
2. Place a spacer on the end of the inhaler. If you don’t have one, roll up a piece of paper to act as a spacer.
3. Breathe out normally. Then place the spacer in your mouth and gently close your lips around it.
4. Press down on the top of the inhaler to release a puff of medication. Breathe in slowly and deeply through your mouth.
5. Keep breathing in slowly for three to five seconds until the lungs are full.
6. Hold your breath for 10 seconds to let the medicine deposit in the lungs.
7. Usually the next puff can be taken right away. In some cases, a one to three minute wait is advised before taking another puff.
8. Check with your doctor for directions for your medications.
## Asthma Medications

### Quick-relief Medications

<table>
<thead>
<tr>
<th>Class of Medication</th>
<th>Generic Names and Available Forms</th>
<th>How Does It Work?</th>
<th>Possible Side Effects</th>
<th>Miscellaneous Information/Handling Side Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Beta Agonists</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>albuterol</td>
<td>(Proventil®, Ventolin®)</td>
<td>• Relaxes the smooth muscles of the airways, making it easier to breathe</td>
<td>• Tremor, fast and/or pounding heartbeat, nervousness and dizziness</td>
<td>• Side effects more common and stronger with oral agents</td>
</tr>
<tr>
<td></td>
<td>Metered-dose inhaler (MDI), Solution for inhalation, Syrup, Tablet</td>
<td>• Lasts 4-6 hours</td>
<td></td>
<td>• If side effects are severe, and last longer than one hour, call your doctor</td>
</tr>
<tr>
<td>levalbuterol</td>
<td>(Xopenex®)</td>
<td></td>
<td></td>
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<tr>
<td>metaproterenol</td>
<td>sulfate (Alupent®) MDI, Solution for inhalation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pirbuterol acetate</td>
<td>(Maxair®, Maxair® Autohaler®) MDI</td>
<td></td>
<td></td>
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<tr>
<td>terbutaline Tablet</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>• Relaxes the smooth muscles of the airways, making it easier to breathe</td>
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<tr>
<td></td>
<td>• Lasts 4-6 hours</td>
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<td></td>
<td>• Tremor, fast and/or pounding heartbeat, nervousness and dizziness</td>
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<td>• Side effects more common and stronger with oral agents</td>
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<tr>
<td></td>
<td>• If side effects are severe, and last longer than one hour, call your doctor</td>
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<tr>
<td><strong>Anticholinergics</strong></td>
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</tr>
<tr>
<td>ipratropium bromide</td>
<td>MDI, Solution for inhalation</td>
<td>• Relaxes the smooth muscles of the airways by inhibiting the action of acetylcholine</td>
<td>• Dry mouth, cough, rapid heartbeat, blurred vision, headache and nervousness</td>
<td>• Most often used in combination with a beta-agonist</td>
</tr>
<tr>
<td></td>
<td>• Lasts 6-8 hours</td>
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</tr>
<tr>
<td><strong>Beta Agonists Combination Anticholinergics/</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>ipratropium bromide/albuterol sulfate (Combivent®, Duoneb®) MDI, Solution for inhalation</td>
<td>• Relaxes the smooth muscles of the airways, making it easier to breathe</td>
<td>• Dry mouth, cough, rapid heartbeat, blurred vision, headache and nervousness and tremor</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Lasts 4-6 hours</td>
<td></td>
<td></td>
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<tr>
<td>Corticosteroids</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>methylprednisolone</td>
<td>(Medrol®) Tablet</td>
<td>• Reduces swelling, inflammation and mucus production in the airways</td>
<td>• Increased appetite, stomach ache, mood changes, muscle pain, fluid retention and increased blood sugars</td>
<td>• Take with food to avoid stomach ache</td>
</tr>
<tr>
<td></td>
<td>(many brands) Tablet, Syrup</td>
<td></td>
<td></td>
<td>• Potential for side effects is dose-related</td>
</tr>
<tr>
<td>prednisolone</td>
<td>(Prelone®, Pediapred®) Syrup</td>
<td></td>
<td></td>
<td>• Long-term use may cause more severe side effects</td>
</tr>
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</tr>
</tbody>
</table>
## Asthma medications

### Long-term Control Medications

<table>
<thead>
<tr>
<th>Class of Medication</th>
<th>Generic Names and Available Forms</th>
<th>How Does It Work?</th>
<th>Possible Side Effects</th>
<th>Miscellaneous Information/Handling Side Effects</th>
</tr>
</thead>
</table>
| **Corticosteroids:**<br>Inhaled | beclomethasone dipropionate (QVAR®)<br>Metered-dose inhaler (MDI)  
  budesonide (Pulmicort®, Turbuhaler®, Pulmicort Respules®)<br>Dry powder inhaler (DPI)<br>inhalation suspension  
  flunisolide (AeroBid®, AeroBid-M®)<br>MDI  
  fluticasone propionate (Flovent®, Flovent® Diskus, Flovent® Rotadisk®)<br>MDI, DPI  
  triamcinolone acetonide (Azmacort®)<br>DPI | **Anti-inflammatory agent**<br>that reduces swelling, inflammation and mucus production in the airways | **Thrush, sore throat, headaches, hoarseness and cough** | **It is not a bronchodilator, and therefore, does not provide immediate relief for acute wheezing**<br>**Rinse your mouth/gargle after each treatment and use a spacer to decrease risk of thrush** |
| **Long-acting Beta agonists** | albuterol extended release Tablets  
  formoterol fumarate (Foradil® Aerolizer®)<br>DPI  
  salmeterol (Serevent Diskus®)<br>DPI | **Relaxes the smooth muscles of the airways for as long as 10-12 hours** | **Tremor, fast and/or pounding heartbeat, nervousness and dizziness** | **Do not use to relieve an acute asthma attack or acute symptoms** |
| **Combination Inhaled Corticosteroids/Long-acting Beta agonists** | fluticasone propionate/salmeterol (Advair Diskus®)<br>DPI | **Reduces inflammation of the lungs and relaxes the smooth muscles of the airways** | **Thrush, sore throat, headaches, hoarseness, cough tremor, fast and/or pounding heartbeat, nervousness and tremor** | **Do not use to relieve an acute asthma attack or acute symptoms** |
## Asthma medications

### Long-term Control Medications

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<th>Possible Side Effects</th>
<th>Miscellaneous Information/Handling Side Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leukotriene Modifiers</td>
<td>montelukast sodium (Singulair®) Tablet</td>
<td>• Blocks the effects of some substances in your body that produce asthma symptoms (needs to be taken daily)</td>
<td>• Similar to placebo (no medication)</td>
<td>• Must be taken daily to control symptoms</td>
</tr>
<tr>
<td></td>
<td>zafirlukast (Accolate®) Tablet</td>
<td>• Inhibits the production of some substances that produce asthma symptoms (needs to be taken daily)</td>
<td>• In rare cases, liver damage</td>
<td>• Accolate should be taken one hour before or two hours after meals</td>
</tr>
<tr>
<td></td>
<td>zileuton (Zyflo®) Tablet</td>
<td></td>
<td></td>
<td>• Use of Accolate requires monitoring if patient also uses theophylline or warfarin</td>
</tr>
<tr>
<td>Mast Cell Stabilizers</td>
<td>cromolyn sodium (Intal®) Metered-dose inhaler (MDI), solution for inhalation</td>
<td>• Stabilizes the cells lining the airways, blocking the response to triggers (blocks inflammation)</td>
<td>• Throat irritation, cough and bad taste</td>
<td>• Liver function tests need to be monitored on a regular basis</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Theophylline, warfarin and propranol need monitoring if using Zyflo</td>
</tr>
<tr>
<td>Theophylline</td>
<td>theophylline (eg, Slo-bid Gyrocaps®, Slo-Phyllin®, T-Phyl®, Theolair®, Theo-Dur®, Uni-Dur®, Uniphyl®) Capsules, Tablets, Syrup</td>
<td>• Relaxes the smooth muscles of the airways, making it easier to breathe</td>
<td>• Nausea, vomiting, stomach ache, diarrhea, irritability, restlessness, trouble sleeping, muscle twitching and fast heart rate</td>
<td>• Very minor side effects</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Sustained release products last 12-25 hours/others 4-6 hours</td>
<td></td>
<td>• Do not use to relieve an acute asthma attack or acute symptoms</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Important to take at prescribed times</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• If you experience an increase in intensity of side effects, call your doctor</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Theophylline levels need monitoring</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Ask doctor about drug interactions</td>
</tr>
</tbody>
</table>
5. Taking action when asthma acts up

Strategies such as monitoring peak flows, avoiding asthma triggers and taking preventive medications can decrease the frequency of asthma episodes. Asthma, however, is chronic, and no prevention strategy is 100 percent effective. Being prepared is the best strategy for successfully dealing with unpredictable asthma episodes.

One way that many people manage their asthma well is by using an asthma action plan. This chapter provides general steps to follow when asthma flares up. Your health care provider can help you develop an asthma action plan based on your specific needs.

Heeding the warning signs

An uncontrolled asthma episode can be frightening — especially if you don’t know what to do to bring it under control. By learning to identify early warning signs and how to treat symptoms, you will be better prepared to handle asthma episodes when they occur. Early treatment of asthma episodes will prevent them from becoming so severe that a trip to the doctor or emergency room is needed.

Asthma tends to flare up most often at night, in the early morning hours or after exposure to a trigger. Common warning signs that an asthma episode is beginning or already under way include:

- Tightness in the chest or extra effort to breathe
- Wheezing
- Repeated coughing
- Nighttime coughing or shortness of breath
- Incomplete or short duration of relief from usual asthma inhaler
- Exercise intolerance

Common warning signs of an asthma attack include tightness in the chest, wheezing, repeated coughing, and nighttime coughing or shortness of breath

If your usual asthma inhaler does not provide complete relief or provides shorter duration of relief from symptoms, an asthma attack may be beginning or already under way.
**Signs of poorly controlled asthma**
When asthma is not managed well, severe symptoms requiring hospitalization may result. With proper self-care and medications, as well as timely medical advice, critical episodes can be avoided. The following are danger signs to watch for:

- Medications aren’t controlling symptoms  
  (example: the inhaler is now providing less relief of symptoms for a shorter time period, requiring more frequent usage)
- Increased breathing rate
- Coughing doesn’t clear mucus
- Sucking in of the chest skin between the ribs and/or at the neck (retractions)
- Difficulty speaking because of breathlessness
- Constant wheezing during sleep
- Dehydration resulting from persistent vomiting or persistent high fever (greater than 101°F)
- Severe neck or chest pain

The appearance of any of these symptoms requires immediate medical attention.

**Get control with an asthma action plan**
An asthma action plan is something you and your health care provider will develop together. Its purpose is to help you recognize the early warning signs of an asthma episode and then to outline steps to follow for relief. Keep a copy of your asthma action plan where you can find it easily for quick reference. You might keep a copy at work as well as at home. Carrying a copy in your purse or wallet is also a good idea. Parents should provide a copy of their child’s plan to the child’s daycare provider or teacher and to the school health office.

Your asthma action plan will outline a medication program that’s based on both symptoms and peak flow readings. Usually, the first step in an action plan is to avoid asthma triggers and to take maintenance medications to prevent episodes. The second step involves the use of fast-acting medications to relieve asthma symptoms when an episode does occur.

If symptoms continue, an oral steroid may be prescribed for five to seven days to stop the reaction that’s triggering the asthma and to heal the airways by reducing swelling and mucus build-up. Your doctor may recommend that you keep a supply of an oral steroid, such as prednisone, on hand in case it is needed.

Print a copy of the asthma action plan worksheet in this chapter and complete with the help of your doctor. The plan should be adapted to your specific needs based on your personal best peak flow level and your ability to recognize and effectively treat early symptoms.

Following your asthma action plan will help you avoid unnecessary visits to the doctor and lower your chances of needing emergency room care. By controlling your asthma and reporting problems early, many hospital admissions for asthma can be avoided. However, if you feel you need emergency care, never hesitate to get it. It’s always better to be safe than sorry.
**Asthma action plan**
Complete this worksheet with your health care provider. Because asthma and asthma action plans tend to change with time, print a copy of these two pages instead of writing your plan in this guide. This way, you will be able to update your asthma action plan easily in the future. Please note: Asthma action plans should be established with the guidance of your health care provider.

Your personal best peak flow is: _______________________

Next asthma appointment and how much time will be needed: _____________________________________

Patient’s Name: _________________________ Date of Birth:______________________________________

Provider’s Signature: ____________________________ Date:______________________________________

---

### Green Zone: All clear

Peak flow above _____________ (80 percent or greater of personal best)

- No symptoms of asthma
- Able to participate in usual activities
- No sleep disturbance by asthma, such as coughing, wheezing, shortness of breath or chest tightness

Other: _________________________________

1. Take asthma maintenance medications:

<table>
<thead>
<tr>
<th>Name</th>
<th>Dose</th>
<th>How often</th>
</tr>
</thead>
<tbody>
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</tr>
</tbody>
</table>

Common side effects that may occur: ________________________________

2. Avoid and/or treat your asthma triggers, which include: ________________________________

3. Follow your schedule for taking peak flow testing: ________________________________

---
Yellow Zone: Caution

Peak flow between _____________ and _____________ (50-80 percent of personal best)

Early warning signs of acute asthma episode:
- Coughing or mild wheezing
- Drop in peak flow meter reading
- Runny, stuffy or congested nose
- Sneezing
- Not sleeping or eating well
- Tired, weak or low energy
- Itchy or watery eyes

Symptoms of acute asthma episode:
- Rapid breathing
- Increased wheezing
- Frequent, tight cough
- Shortness of breath
- Difficulty breathing out (exhaling)
- Tired, weak or low energy
- Sucking in of the chest skin between the ribs and/or at the neck (retractions)

1. Continue taking maintenance medications listed in Green Zone.

2. Add fast-acting medications:

<table>
<thead>
<tr>
<th>Name</th>
<th>Dose</th>
<th>How often</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>

3. If no symptom relief within 30 minutes of giving medication and peak flow is below ________________ add oral steroid, as follows: ____________________________

Common side effects that may occur: ____________________________

_________________________
Red Zone: Medical alert

Peak flow below _____________ (less than 50 percent of personal best)

Severe symptoms requiring immediate medical care:
- Blue lips
- Severe difficulty breathing
- Prolonged shortness of breath not relieved by medication (or only briefly relieved)

1. Continue taking fast-acting medications listed in Yellow Zone.

2. Other medical instructions:
   Give oral steroid: _____________________________________________________________
   Call health care provider at: ___________________________________________________
   Other instructions: _____________________________________________________________

3. Call 911 if you observe these symptoms:
   - Gasping for air with sweating
   - Extreme anxiety due to difficulty breathing
   - Condition rapidly getting worse
Regular physical activity builds muscle tone, bone density, overall strength and endurance. It also plays an important role in controlling chronic disease such as high blood pressure and diabetes and can help lower cholesterol and control weight. People who exercise feel better, look healthier and have more self-confidence. Team and other group-oriented sports offer the added benefit of teaching children and youth how to reach for goals, build relationships and work well with others.

Doctors now advise people of all ages with asthma to get regular physical activity. This may mean participating in a team sport, working out at a health club or simply going for a good, brisk walk most days of the week. Although no form of exercise can improve sensitive airways, regular physical activity can greatly improve cardiovascular (heart and lung) conditioning.

**What is exercise-induced asthma?**

Exercise is a common trigger for people with asthma. For some, it is just one of several factors that can trigger an episode. For others, it is the only trigger.

Exercise-induced asthma (EIA) occurs most often during continuous, strenuous activity that raises the pulse above 80 percent of the maximum heart rate. At this exertion point, most people begin to breathe through the mouth instead of the nose. Because of this, the air that reaches the small airways in the lungs is drier and cooler than usual. This irritates the airways, triggering an asthma episode.

Symptoms of EIA are the same as for any other asthma episode — coughing, wheezing, tightness in the chest and breathlessness. They most often begin about six to 12 minutes into exercise. Symptoms tend to peak about five to 10 minutes after exercise is stopped.

Various challenges or stress tests on treadmills and stationary bikes are available for diagnosing EIA. An easier and equally effective method is simply to take peak flow readings before, during and after exercise. If your peak flow readings decrease with exercise, you should add exercise to your list of asthma triggers.

As many as 90 percent of people with asthma are at risk of attacks brought on by exercising and playing sports (Source: Mayo Clinic)

Exercise-induced asthma attacks can happen anywhere from six to 10 minutes after vigorous exercise to several hours after you stop exercising.

Some activities are less likely to induce asthma episodes than others. Swimming is often recommended as an ideal workout for people with asthma because the water tends to moisten the air that is inhaled. Football, softball, tennis and other sports that involve brief spurts of activity with rests in between are also less likely to bring on an episode. Still, you can participate in almost any physical activity or sport you like as long as you take proper precautions. These include pretreatment with medications, allowing yourself time to warm up, and monitoring your peak flow levels. Your doctor can help you develop an action plan for preventing EIA.
Pretreatment for exercise-induced asthma

Your health care provider can help you develop an action plan for preventing EIA. In most cases, such a plan includes taking your asthma-maintenance medication as you would normally and adding a pretreatment of a fast-acting asthma drug. A beta agonist, cromolyn sodium, or in some cases, a combination of both are frequently used for this purpose. These fast-acting inhaled medications are most often taken five to 10 minutes before exercise.

Warming up prior to exercise can also help prevent or reduce the severity of EIA. A 10-minute warm-up is generally advised for any exercise routine because it helps prevent injury to muscles and tendons. This same warm-up period can also help bring you past that critical period early in the exercise session when the airways are most likely to become irritated.

Take a peak flow reading before and after exercise or if you begin to experience symptoms. If your peak flow reading drops or you have symptoms, follow the steps outlined in your exercise-induced asthma action plan on the next page.

Tips for exercising safely

- Be sure to take medication, if prescribed, before exercising
- Keep an inhaler or other medication handy during exercise
- Wear a scarf or mask over your mouth if exercising in cold weather; dress in layers
- Begin workouts with a gradual warm-up period of stretching, walking or doing your planned activity at an easy pace
- Follow workouts with a gradual cool-down period of stretching or walking
- Drink plenty of water
- Avoid exercising if you have a cold or other upper-respiratory infections
**Exercise-induced asthma action plan**

Ask your health care provider to help you develop your own exercise-induced asthma action plan.

Then use your plan to prevent exercise-induced asthma episodes.

1. Take asthma maintenance medications as prescribed in your main asthma action plan.

2. Before exercise, take the following medication as pretreatment:

<table>
<thead>
<tr>
<th>Name</th>
<th>Dose</th>
<th># of minutes before exercise</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
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<td></td>
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</tbody>
</table>

3. Take a peak flow reading ____________ minutes before and ____________ minutes after exercise.

4. Stop exercise and check peak flow level if you experience asthma symptoms.

5. Follow your regular asthma action plan if you experience symptoms or if your peak flow readings drop. Resume exercise session only after you return to your Green Zone (as outlined in your asthma action plan).

**Enhancing your performance**

Whether you are an athlete or someone who just wants to stay fit and healthy, you will play better, perform more effectively and enjoy physical activities more if your asthma is under control. Keeping your physical activities enjoyable and asthma episode-free is just one more reason to keep your asthma well managed.
7. Special concerns for children and teens

Asthma management is basically the same across all ages. All the information you’ve read so far in this guide applies to children and teenagers as well as adults. Asthma can create some special issues for young people, though. For the most part, these involve making sure your son or daughter doesn’t overuse or underuse medications. You will also want to make sure asthma doesn’t disrupt your child’s school activities or prevent him or her from enjoying being a kid.

Children and teens who have asthma can do the same things as other kids their age. One of the keys to successful asthma management is to help your child feel “normal.” Caring for asthma should become just another necessary routine for staying healthy — like brushing your teeth every day to prevent cavities. Of course, a severe asthma episode is more serious than needing a tooth repaired, but you stand a better chance of avoiding hassles over taking peak flow readings or medications if asthma care is seen as another daily routine that must be followed for good health.

Children as young as four years old can get involved in their own asthma management. They can learn to swallow pills, recognize triggers and use peak flow meters and inhalers. They can also describe how they feel. Encourage your child to act independently and to take more and more responsibility for asthma care as he or she grows.

Asthma management should not stop when children are at school. You can help ensure your child’s school experience is all it should be by sharing information about your child’s asthma with his or her teachers and the school nurse. This can be done with a few simple phone calls, a letter or a visit before school begins. Give a copy of your child’s asthma action plan to teachers — especially physical education teachers — and to the school health office. The asthma action plan will contain most of the information school staff needs to know about your child’s asthma, but other key information to share includes the following:

- Your child should be allowed to carry medications and possibly a peak flow meter with him or her in case they are needed

- If school policy prohibits the above, ask that your child’s inhaler be kept in a safe place in the classroom (as opposed to the school health office), such as the teacher’s desk or a locked file cabinet so it is quickly accessible

- Your child can participate fully in all physical activities but may need to take medications beforehand

- Your child should be allowed to rest from physical activities and to take medications if needed

- If teachers have concerns about the way your child is caring for his or her asthma at school (for example, taking medication too frequently or not frequently enough), they should call you

“Mom, let me stay home today”

Unfortunately, asthma causes more missed days from school than any other chronic childhood illness. When asthma is under control, absenteeism can be reduced and children can participate in regular school activities. In general, your child can go to school if he or she has:

- A stuffy nose but no wheezing

- Mild wheezing that clears after taking medication
Consider keeping your child home from school if any of the following are present:

- Evidence of an infection, a sore throat or swollen, painful neck glands
- An oral temperature over 100.5° F
- Wheezing that continues to be labored an hour after medication is given
- Weakness or tiredness that makes it difficult to participate in usual daily activities
- Difficulty breathing

Asthma and teens
Testing limits and feeling invincible are fairly normal parts of adolescence that can be very trying for parents. For kids with asthma, this often means seeing if they can do without their asthma medications. Some adolescents may feel frustrated with or tied down by the medication routine. Others may want to prove to themselves, their parents or their friends that they can make their own decisions — including deciding not to take their medications.

So what’s a parent to do? Let your child know that not wanting to take asthma medications is normal, as is feeling frustrated, angry or denying that you have the disease. Offer empathy, but make it clear that you expect your son or daughter to take appropriate care of his or her asthma. Set the ground rules, and explain your position just as you would for any other situation, such as how late he or she can stay out at night. If the problem persists, here are several strategies to try:

Consult the doctor. Ask your son or daughter’s doctor to talk with your child about the need for good asthma control. Talk over the phone with the doctor to explain the situation before your child’s appointment. Ask the doctor to reassess your child’s asthma.

Use consequences. If your son or daughter’s asthma is getting out of control because he or she isn’t taking proper care of it, impose a “logical consequence.” For example, she won’t be allowed to go on summer tour with the marching band if she continues to ignore her asthma action plan. Or he won’t be allowed to continue the part-time job (meaning no money for gas, going out or expensive sneakers) if he continues to miss classes because he won’t carry his inhaler. Determine ahead of time what the consequences will be. If the problem continues, follow through.

Find an asthma support group. Living with a chronic condition such as asthma can be frustrating for a young person. A support group with other adolescents who have asthma may help your son or daughter with some of the emotional issues of asthma. Your health care provider, local hospital or the American Lung Association may have information about support groups in your area.

Don’t nag. It will only make matters worse. Take heart — with time, most teens eventually return to taking appropriate care of their asthma.
8. Other things to consider

There are situations where having asthma can raise some special issues of which you should be aware. These include pregnancy, other medical conditions or when asthma gets you down emotionally. You will also need to take a few extra steps when planning trips so asthma doesn’t spoil your work or fun.

Asthma and pregnancy
Managing your asthma is particularly important when pregnant, because the oxygen you breathe is shared by the developing baby. If you don’t get enough, neither does the baby. Therefore, the mother-to-be should not simply stop all medications during pregnancy. It may be more dangerous to stop taking certain medications that are controlling the asthma symptoms than to continue them. During pregnancy, the majority of women will do well in controlling their asthma. It is very rare that a condition such as asthma gets worse during pregnancy.

Talk with your health care provider as soon as possible if you think you might be pregnant or if you are planning a pregnancy. Your health care provider can review your medications to help ensure you are taking those that will be safest for you and your baby. You should continue to use these same medications if you decide to breastfeed. Most asthma medications are safe to take during pregnancy and while nursing.

Your health care provider or pharmacist can tell you which medications you should avoid while pregnant or nursing. Allergy injections are usually continued during pregnancy.

Asthma and other medical conditions
Whenever taking multiple medications, especially ones for treating different medical conditions, check with your health care provider and pharmacist to avoid potentially serious drug interactions. Some combinations of medications can cause side effects. Some drugs can interfere with the effectiveness of other drugs when taken together.

Many people who have more than one chronic disease (for example, asthma and high blood pressure or heart disease) also see more than one doctor. If this is the case for you, be sure each doctor knows what medications the others have prescribed. Also, keep all the doctors you see informed about any over-the-counter medications you take regularly, including pain relievers, cold remedies, antacids and the like. The following are some medications that might have consequences for someone with asthma:

- Beta-blockers (for high blood pressure or migraines) — may produce an opposite effect of the adrenaline-like medications being taken for asthma
- Angiotensin-converting enzyme (ACE) inhibitors — may cause cough
- Aspirin and other nonsteroidal anti-inflammatory drugs (NSAIDs) — may act as an asthma trigger in some people

Sometimes a chronic condition can also exacerbate asthma. One example is gastroesophageal reflux disease (GERD). While some symptoms of GERD may be hard to distinguish from asthma, GERD can also trigger or worsen asthma symptoms. Talk to your doctor if you think you have GERD or have been diagnosed with the condition. Treatment of GERD symptoms may improve your asthma.
Asthma and emotions
Asthma is a physical illness, not a psychological one. But coping with asthma may have psychological effects—on family members as well as the person who has asthma. Like any other chronic disease, asthma can be stressful. Imagine the normal pressures a family faces in a year’s time and add to that disruptions due to illness. Obviously this disease impacts everyone involved.

Some adults and children with asthma may occasionally show signs of depressed mood, low self-esteem, fear or uncertainty about the future. Such feelings are normal reactions and can often be relieved by learning more about the disease and proper asthma management. But information alone doesn’t provide relief from these kinds of feelings for everyone. If you or your child continue to struggle with emotions related to asthma, be sure to seek help. Your health care provider can recommend some helpful options—such as family or individual counseling, asthma support groups or other referrals.

Be especially certain to consult your health care provider if you have feelings of depression that last most of the day and continue nearly every day for two weeks or more; clinical depression is not a normal part of having asthma. Some symptoms of depression include depressed mood (sadness), loss of interest in things you normally enjoy, decreased energy, insomnia or excessive sleeping, feeling of worthlessness or excessive guilt, significant weight loss or gain, inability to think or concentrate, feeling agitated, and recurrent thoughts of death or suicide.

Tips for traveling
Travel, whether for a family reunion, business or vacation, can provide new and enriching experiences. But one experience you can do without on a trip is an asthma episode. With a little extra planning before your trip, you can prevent unexpected asthma episodes from ruining your fun or interfering with your work.

Here are a few tips to consider:

- Check out the seasons. Remember that different regions begin seasons at slightly different times. For example, if you live in Chicago and are traveling to Atlanta, you may walk off the plane into springtime when the runway at home was surrounded by four-foot snow banks. If you have spring allergies, you will also need to bring along your allergy medications. The weather page of most large newspapers lists average temperatures for various cities throughout the country. This can give you a clue as to what season to expect.

- Reserve a non-smoking room. Most hotels, motels and inns now have rooms set aside for non-smokers.

- Keep medications with you. Pack medication in your carry-on luggage. This way you’ll have it if you need it while en route.

- Pack an adequate supply of medicines. Filling prescriptions away from home can be a real hassle. It can also add an unwanted and unexpected hefty expense. Pack two sets of medications, including inhalers—one to be kept handy at all times and another to be stowed with the luggage. Most doctors recommend that people with asthma carry an emergency supply of an oral steroid, such as prednisone, when traveling.

- Bring along medical information. Pack a copy of your asthma action plan. If your asthma is severe or you have drug allergies or other medical conditions that may result in an emergency, wear a medic alert bracelet or necklace listing this information.

- Know what your health insurance will cover. Know the coverage limitations for out-of-town emergencies. If traveling out of the country, pack an electric socket adapter (compatible with the foreign country’s electric sockets) and transformer if you will be using a nebulizer. These are available where luggage or other travel aids are sold. And check with your travel agent or a travel clinic about necessary immunizations. A travel clinic can also let you know about any conditions that might affect your asthma management.

- Plan to enjoy yourself. Whether traveling or following your usual routine at home, just remember that life can be good and fulfilling—even if you have asthma.
9. Getting additional help

Want more information? There are many people, organizations and resources available to help you manage your asthma. Here are a few suggestions.

Medical Professionals

› Your primary care physician
  If you have questions about asthma, medications or follow-up, contact your primary care physician (PCP) first. Most doctors are well-prepared to assist you in this area.

› Specialists
  If you are having difficulty controlling your asthma, or your asthma is severe, your PCP may recommend that you see an allergist or pulmonologist. These are doctors who specialize in asthma. They can also be of help in determining the cause of your asthma.

› Pharmacists
  Your local pharmacist can provide you with valuable information about the medications your doctor has prescribed. He or she can help you avoid other medications that might interfere with successful treatment of your asthma, as well as help you get the greatest benefit from your medicines.

Organizations

› American Academy of Allergy, Asthma & Immunology
  555 East Wells Street, Suite 1100
  Milwaukee, WI 53202
  1-414-272-6071
  www.aaai.org

› American College of Allergy, Asthma & Immunology
  85 W. Algonquin Road, Suite 550
  Arlington Heights, IL 60005
  1-847-427-1200
  www.acaai.org

› Allergy & Asthma Network Mothers of Asthmatics
  8201 Greensboro Drive, Suite 300
  McLean, VA 22102
  1-800-878-4403
  www.aanma.org

› Asthma and Allergy Foundation of America
  8201 Corporate Drive, Suite 1000
  Landover, MD 20785
  1-800-727-8462
  www.aafa.org

› American Lung Association
  1301 Pennsylvania Ave. NW, Suite 800
  Washington, D.C. 20004
  1-202-785-3355
  www.lungusa.org

› National Asthma Education and Prevention Program (National Heart, Lung, and Blood Institute)
  P.O. Box 30105
  Bethesda, MD 20824
  1-301-592-8573
  www.nhlbi.nih.gov/about/naepp/

› National Jewish Medical Health
  1400 Jackson Street
  Denver, CO 80206
  LUNG LINE® 1-800-222-5864
  www.nationaljewish.org/

Additional reading

National Asthma Education and Prevention Program. Guidelines for the Diagnosis and Treatment of Asthma.
www.nhlbi.nih.gov/guidelines/asthma.
10. Glossary

The words and phrases listed are commonly used in relation to asthma:

**Allergens**
Substances such as animal dander, dust, mold and pollens that cause allergic reactions to sensitive (allergic) individuals.

**Allergy**
A strong reaction to certain substances that is marked by allergic rhinitis (hay fever), asthma and eczema (dry, itchy skin).

**Alveoli**
Structures of the lungs that are thin-walled air sacs. There are more than 750 million alveoli in the lungs that allow the exchange of oxygen and carbon dioxide.

**Anticholinergics**
A class of asthma drugs used to stop coughing by blocking messages from the nerves to the lungs that cause the coughing response.

**Antigens**
Substances to which the immune system can react.

**Asthma episode**
A sudden worsening of asthma symptoms.

**Asthma diary**
A record of your daily symptoms, including details of episodes, peak flow meter readings and medications.

**Beta agonists**
These medications work by opening the airways in the lungs, making breathing easier. They are used especially for quick relief of acute asthma.

**Bronchi/bronchioles**
The medium and smaller-sized air tubes in the lungs which can be affected in asthma.

**Bronchodilators**
A class of drugs that cause bronchial smooth muscles to relax, resulting in the air passages becoming larger.

**Bronchospasm**
Constriction of the air passages in the lungs caused by contractions of bronchial smooth muscles.

**Corticosteroids**
The cortisone class of drugs that decrease swelling in bronchial tubes and decrease lung inflammation.

**Cromolyn sodium**
An anti-inflammatory asthma drug. It helps prevent exercise-induced asthma and blocks reactions triggered by allergens such as animal dander or pollens.

**Diaphragmatic breathing**
A deep-breathing technique that helps induce a relaxation response. Breathing takes place from the diaphragm (located underneath your lungs and above your stomach) so your abdomen moves in and out.

**Epinephrine**
A quick-relief asthma drug used to relieve serious asthma episodes.

**Exercise-induced asthma**
Symptoms such as coughing, chest tightness, wheezing and fatigue that are triggered by physical activity.

**Leukotriene modifiers**
A new class of oral anti-asthma medications that are thought to block asthma-causing substances in the body.

**Long-term controller**
Medication that is taken daily to manage and control persistent asthma.

**Metered-dose inhaler (MDI)**
A hand-held device that delivers a measured (metered) dose of asthma medication in an aerosol spray or powdered form.

**Nebulizer**
A device attached to an air compressor that delivers a fine mist of asthma medication or saline (salt water solution) deep into the lungs.
**Nedocromil**
An inhaled asthma drug that reduces swelling; used to treat mild to moderate persistent asthma.

**Peak flow meter**
A small, hand-held instrument that measures the flow of air exhaled from the lungs. It is commonly used to detect early signs of an asthma episode.

**Quick-relief medications**
Medication that is used to relieve acute or severe symptoms of asthma episodes. They work by relaxing the muscles of the airways to help them re-open quickly.

**Spacer**
A holding chamber that attaches to the metered-dose inhaler. This device helps deliver more medication to the lungs, decreases gagging and coughing, and can help prevent a yeast infection of the mouth (thrush) when taking inhaled corticosteroids.

**Spirometer**
A device that measures the amount of air exhaled. Doctors use it to measure the amount of airway obstruction in patients with asthma.

**Spirometry**
A test that doctors use to diagnose asthma. Using a spirometer, a doctor can measure the condition of airway passages.

**Theophylline**
A bronchodilator that opens up airway passages. It is especially effective for treating nighttime asthma.

**Thrush**
A yeast infection in the back of the throat and tongue that could be caused by inhaled corticosteroids.

**Trachea**
The tube-like structure, also called the windpipe, through which air moves to and from the bronchi.

**Trigger**
Substances, activities or conditions that cause the airways to react and asthma symptoms to occur.
Maintaining a daily asthma diary

Use this daily asthma diary to help keep track of how well you are managing your asthma. Each day measure your peak expiratory flow (PEF) in the morning and in the evening. Record your PEF, as well as any symptoms and their triggers on the chart below.

Asthma zones

Personal best peak flow: ______________

Green Zone (80 percent or greater of personal best peak flow): greater than ______________________

Yellow Zone: (50 to 80 percent of personal best peak flow): ______________ to ___________________

Red Zone: (Below 50 percent of personal best peak flow): less than ____________________________

Medications: ____________________________________________________________________________ 
_________________________________________________________________________________________ 
_________________________________________________________________________________________

Sample daily asthma diary

<table>
<thead>
<tr>
<th>Date</th>
<th>PEF Readings AM</th>
<th>PEF Readings PM</th>
<th>Number of Puffs of Rescue MDI/DPI</th>
<th>Cough</th>
<th>Wheeze</th>
<th>Shortness of Breath</th>
<th>Chest Tightness</th>
<th>Possible Triggers</th>
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<td>540</td>
<td>540</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>Cat exposure</td>
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</tbody>
</table>

Severity of symptoms

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<th>2</th>
<th>3</th>
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</thead>
<tbody>
<tr>
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<td>Occasional</td>
<td>Frequent</td>
<td>Continuous</td>
</tr>
<tr>
<td>Wheeze</td>
<td>None</td>
<td>Some</td>
<td>Medium</td>
<td>Severe</td>
</tr>
<tr>
<td>Shortness of breath</td>
<td>None</td>
<td>Some</td>
<td>Medium</td>
<td>Severe</td>
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<tr>
<td>Chest tightness</td>
<td>None</td>
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## Daily asthma diary

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<th>PEF Readings AM</th>
<th>PEF Readings PM</th>
<th>Number of Puffs of Rescue MDI/DPI</th>
<th>Cough</th>
<th>Wheeze</th>
<th>Shortness of Breath</th>
<th>Chest Tightness</th>
<th>Possible Triggers</th>
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