Understanding asthma

Oxford | Self-help guide

OXFORD HEALTH PLANS®

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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, as it has been for track and field athlete Jackie Joyner-Kersee, who has won six Olympic medals and broken world records — despite her 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. And not everyone follows the same course of treatment. This guide is not a substitute for medical advice from your physician. Your healthcare provider can help you develop your own asthma action plan. Bring this book along to your next doctor visit and ask your healthcare provider to help you complete your personalized asthma action plan on page 36 and 37. Before long, you can be on the road to successfully managing your asthma.

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1. Understanding asthma

- The word “asthma” is derived from a Greek word meaning “breathlessness” or “panting,” both of which describe symptoms present during an asthma attack
- More than 20 million people in the United States have asthma (Source: American Lung Association)
- Asthma is the nation’s most common chronic disorder in children; it affects about 9 million children under the age of 18 (Source: National Institutes of Health)
- Close to 2 million Americans over the age of 65 have been diagnosed with asthma (Source: American Lung Association)

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 healthcare 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 healthcare 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 healthcare provider will probably ask you some of the following questions:

- What symptoms are you having (wheezing, coughing, 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 healthcare 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 healthcare 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 chemicals 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:

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.

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.

If you think you may have allergies, talk with your healthcare 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 healthcare 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.

Reducing allergens in your home

Here are just a few things you can do to minimize asthma triggers in your home:

- 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; basements tend 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

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.

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. Children whose asthma episodes occur only after viral infections, such as colds, are more likely to eventually grow out of this problem and be asthma-free as adults.

Avoiding trigger infections

It may be impossible to prevent getting a cold, flu or other upper-respiratory infection entirely. In fact, most people get three to five colds a year and it's not unusual for very young children to have as many as 10 to 15 colds a year. But you can follow a few simple steps to lower your odds of catching these illnesses:

- 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
- Keep healthy with nourishing foods, lots of fluids, regular exercise, and plenty of sleep

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 healthcare provider can recommend asthma medications to begin taking early during the viral infection to help prevent an asthma episode. Call your healthcare 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 in restaurants, ask to be seated in the non-smoking section. 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. At every Olympics, there are world-class athletes who have asthma, and some have won gold medals.

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 healthcare provider to recommend pretreatment medications to avoid asthma episodes, then allow yourself 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 nonsteroidal 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.

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, 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.

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.

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.

Allergic triggers

__ House dust (dust mites)
__ Seasonal allergens – pollens from trees, grass, ragweed,or other plants
__ Mold outdoors, mildew indoors
__ Animals
  __ cats
  __ dogs
  __ rodents (hamsters, guinea pigs)
  __ birds
__ Other

Irritants

__ Tobacco smoke
__ Weather conditions – extremes or sudden changes in temperature, barometric pressure or humidity
__ Air pollution
  __ indoor pollution (smoke from fireplaces or wood-burning stoves; fumes from building products, carpeting, paint; etc.)
  __ outdoor pollution (smog, car or truck exhaust, etc.)
__ Fragrances or fumes from various products:

_____

_____

Infections

__ Viral upper-respiratory infections – colds and flu
__ Bacterial infections – strep throat, sinus infections, pneumonia, bronchitis

Exercise of physical exertion

__ Specific sports or other activities:

_____

_____

Emotions

__ Crying or laughing
__ Stress
__ Anger
__ Fear (especially when an asthma episode begins)

Aspirin or NSAIDS

__ Aspirin
__ Other NSAIDS
  __ ibuprofen (Advil,® Motrin,® Nuprin®)
  __ naproxen (Aleve®)

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 healthcare 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

- 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

- 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 healthcare provider

Your healthcare 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.

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.

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.
8. Repeat steps 1 through 7 two more times (unless the test has provoked a coughing attack).
9. Record the highest of the three numbers achieved. This is your peak flow reading.

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 healthcare 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 reading 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 healthcare 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 healthcare 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.

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 day care 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 day care.

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 healthcare provider.

A sample asthma diary is shown on page 55.

4. Getting the most from asthma medications

While there is no "cure" for asthma, medications are available to prevent and control symptoms effectively. With the right medications, most people with asthma lead normal, healthy lives.

Just as each person's asthma is unique, approaches for treating asthma need to be targeted to each individual's needs. Some people with asthma take medicine daily, while others take medicine on an as-needed basis.

Asthma is classified by level of severity based on your daytime and nighttime symptoms and your breathing test results. Most common is mild intermittent asthma. Persistent asthma can be mild, moderate or severe. The type and amount of medicine is matched to the level of severity. The treatment program initially gains control of asthma symptoms, then maintains control with the minimum effective dose of medication.

- Asthma cannot be cured, but it can be managed, and remissions (or symptom-free periods) may occur
- Most people with asthma need to be re-evaluated by their doctor at least once a year
- Some common over-the-counter drugs can cause serious complications if taken with asthma medications; check with your doctor or pharmacist before taking other medications

Understanding your asthma medications — what they do, how they work, when to take them, and possible side effects — will help you to use them safely and effectively. Taking medications as directed is essential for asthma management. Working in partnership with your healthcare provider helps ensure that your medication treatment program is tailored to your needs.

How asthma medications work

A variety of medication is available for managing asthma. The type of medication your doctor prescribes will depend on the severity of your asthma. Many people with mild intermittent asthma are able to manage well with **quick-relief medications** alone. Most people who have frequent asthma episodes or persistent asthma, however, take at least two kinds of medication — one that provides quick relief during an asthma episode by relaxing the muscles of the airways, and another long-term controller taken daily that can prevent or reduce the inflammation and excessive mucus production.

It is important that you know which medications serve which of these purposes. Taking your daily **long-term controller** medication as directed is essential for good asthma management. But these medications will **not** provide adequate relief **during** an asthma episode, however. For that, you will need a quick-relief medication prescribed specifically for use during asthma episodes.

Long-term control medications

The best way to control an asthma episode is to prevent it from beginning in the first place. Several types of medications are used for long-term control. Anti-inflammatory medications work by preventing mucus production and airway swelling. These medications do not immediately relieve asthma symptoms, but they do help control asthma with regular use. To be effective, they must be taken daily — even on days when you feel fine.

Inhaled corticosteroids

Inhaled **corticosteroids** are the most potent and consistently effective long-term control medication for asthma. Their action reduces inflammation in the airways. Inhaled corticosteroids reduce asthma exacerbations, emergency room visits and hospitalizations. They increase breathing test results and reduce airway twitchiness. They also may prevent damage to the airways caused by asthma. Regular daily use is especially important because it can take five to seven days before the inhaled corticosteroids begin to work.

There are many different kinds of inhaled corticosteroids, some with different strengths. Dosage may vary depending on the product used. Usually, these medications are taken regularly one to two times per day.

One type of inhaled corticosteroids is a nebulized form called budesonide (Pulmicort Respules®). This medication is often helpful for children who have persistent asthma.

When taken at recommended dosage levels, these corticosteroids have few serious side effects. Occasional minor side effects from inhaled steroids include hoarseness and **thrush**, a yeast infection in the back of the throat and tongue. These problems can be reduced by using a spacer with the inhaler and by rinsing the mouth with water or gargling with mouthwash after taking the medication. Inhaled corticosteroids help many people with asthma reduce their need for oral corticosteroids, which can have more serious side effects, such as decreased growth, osteoporosis, cataracts, and glaucoma.

Long-acting beta agonists

Long-acting **beta agonists** include inhaled and oral medicines. Inhaled **salmeterol** (Serevent Diskus,® Advair®*) and **formoterol fumarate** (Foradil®) have a 12-hour duration of bronchodilation and are usually used with an inhaled corticosteroid in order to control asthma long-term. Inhaled forms of long-acting beta agonists are preferred because they have fewer side effects and last longer than sustained-release albuterol tablets.

* Advair is a combination of fluticasone and salmeterol.

Combination inhaled steroids/long-acting beta agonists

Advair is a combination of **fluticasone propionate** (Flovent®) and **salmeterol** (Serevent®). It is available in three different strengths of inhaled corticosteroids (i.e., 100/50, 250/50, 500/50). Other inhaled combination products with corticosteroid and long-acting beta agonists are expected in the next few years.

Inhaled corticosteroids for asthma

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

* Advair is a combination of fluticasone and salmeterol.

Long-acting beta agonists

Inhaled

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

Oral

- Extended-release albuterol (many brands)

Leukotriene modifiers

Leukotriene modifiers are another class of medication available for controlling asthma. Leukotrienes are potent substances that can cause bronchoconstriction and increased mucus production, leading to increased asthma symptoms. Zafirlukast (Accolate®) and montelukast (Singulair®) are oral medications that block the actions of leukotrienes. They are used in adults and children either alone or in combination with inhaled corticosteroids.

Cromolyn sodium and nedocromil (mast cell stabilizers)

Cromolyn sodium and **nedocromil** are both under a class of medications called **mast cell stabilizers**. Cromolyn sodium (Intal®) is an inhaled medication that prevents the airways from becoming inflamed. It is mainly used to control mild to moderate allergic asthma by preventing the allergic reaction. Cromolyn sodium is administered through a metered-dose inhaler or nebulizer. It may be used throughout the year or only during certain seasons, depending on the type of allergies a person has.

Cromolyn sodium is also prescribed to help control asthma triggered by exercise or cold air. In this situation, cromolyn is taken just before exercise or exposure to cold air.

Nedocromil (Tilade®) is another non-steroidal asthma medication like cromolyn sodium. Nedocromil is used in mild to moderate persistent asthma as a metered-dose inhaler. Both cromolyn sodium and nedocromil can take two to six weeks of regular use before they begin to work.

Theophylline

When used on a regular basis — usually taken once or twice daily — **theophylline** (a methylxanthine drug) helps maintain relaxed and open airways in the lungs. Because theophylline can take up to several hours to relieve symptoms, it is not used for treating asthma episodes that are already under way. It is also used less frequently than inhaled corticosteroids.

Theophylline is available in a variety of forms and strengths to fit an individual's needs. Capsules are also a convenient form of medication for young children because they can be opened and mixed with foods such as applesauce or yogurt.

Theophylline can produce side effects such as headache, nausea, vomiting, stomach cramps, diarrhea, insomnia, increased heartbeat, and restlessness. These side effects can be a signal that your dosage is too high. If you experience any of these, talk with your healthcare provider. He or she may use a simple blood test to check the level of theophylline in your system. If it is too high, your doctor will probably adjust your dosage or recommend a different theophylline product.

Theophylline can also interact with other medications. If you take theophylline, talk with your doctor or pharmacist before taking other medications — whether prescription or over-the-counter.

Never adjust your theophylline dosage on your own. Taking less than the prescribed dosage or skipping doses can lead to an asthma episode. Taking more than the prescribed amount can lead to serious side effects, including seizures.

Anti-IgE therapy

Anti-IgE therapy [omalixumab (Xolair®)] has recently been approved by the Food and Drug Administration. This injection treatment, given every two to four weeks, decreases the patient's amount of allergic antibody. It has been shown to decrease asthma exacerbations and the need for other medication. It also reduces allergic rhinitis symptoms.

Quick-relief medications

Epinephrine (also called adrenalin) is often used in hospital emergency rooms to relieve severe asthma attacks. It provides quick relief by stimulating the airways to reopen quickly, restoring a free flow of air in the lungs. Epinephrine, however, is not recommended for regular use by patients. Because it can significantly increase the heart rate, it should be administered only by a healthcare professional.

Short-acting bronchodilators

Fortunately, other drugs called **bronchodilators** work much like epinephrine but are safer. Like epinephrine, bronchodilators work primarily by relaxing the muscles of the airways, allowing the airways to open up and making breathing easier.

Inhaled short-acting beta agonists are the most commonly prescribed family of bronchodilators because they work rapidly, are convenient to use, have few side effects, and can be targeted directly to the lungs. Beta agonists are used to provide quick relief from symptoms during an asthma episode. These drugs come in various forms, including tablets, syrups, **metered-dose inhalers** (MDIs), and nebulized solutions.

When used with a metered-dose inhaler, the beta agonist goes directly into the airways to ease the bronchospasm. Relief from asthma symptoms begins within five to 15 minutes and lasts for about four to six hours. Longer-lasting beta agonists, such as salmeterol, are not "rescue" inhalers and should not be used in place of faster-acting beta agonists when immediate relief from an asthma episode is needed.

MDIs can be carried in a pocket or purse and retrieved just moments after coughing or wheezing starts. Beta agonists in syrup, tablet and nebulizer forms can be used with young children and others who have difficulty using an inhaler.

The syrup and tablet forms, however, work more slowly than the inhaled forms (MDI or nebulizer) and can have more side effects. Still, for those with infrequent asthma episodes, syrup or tablet forms of beta agonists may be more convenient.

Like any medication, beta agonists may produce side effects. If these medications are taken in an inhaled form, proper inhalation technique is very important to ensure that the medication reaches the lungs. (For directions on proper inhaler technique, 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 relief more frequently than this, talk with your doctor. You may need a different medication. Overuse of beta agonists is a common sign of uncontrolled asthma. It also increases the chance for possible side effects, including rapid heartbeat, nervousness or headache.

Commonly prescribed short-acting beta agonists

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

Anticholinergics

Anticholinergics are another class of quick-relief medication sometimes used in the treatment of asthma to provide fast-acting relief from acute episodes. The inhaled medication ipratropium bromide (Atrovent®) offers additional, fast-acting relief from acute episodes. They are most often used along with a beta agonist to help relieve coughing during an episode or provide additional bronchodilation; they begin working within 30 minutes after they're taken. Anticholinergics work by blocking signals in the nervous system that tell the body to cough. Combivent® (inhaler) and DuoNeb® (nebulizing solution) are combined beta agonist/anticholinergic products.

Oral corticosteroids

Oral corticosteroids, the strongest asthma medications, are used primarily for those with severe asthma. They are also used to provide quick relief from severe asthma episodes. These medications begin to work within eight to 12 hours of the first dose. Available in both tablet and liquid forms, oral corticosteroids manage asthma very effectively for short periods of time when other medications are ineffective.

Side effects from short-term use (three to 10 days) are unusual but may include weight gain, fluid retention, mood changes, muscle pain, sleep disturbances, and stomach aches. Most symptoms disappear when use of corticosteroids is reduced or stopped. Oral corticosteroids should always be taken with food to prevent an upset stomach. They should be used only with supervision by your healthcare provider.

Long-term use of oral corticosteroids is avoided whenever possible because of potential side effects. However, people who have severe asthma that cannot be controlled adequately with other medications may need to take oral corticosteroids for longer periods. This should be done only with your healthcare provider's supervision. If needed, your healthcare provider can recommend a dosing schedule that minimizes the risk of more serious side effects. Most often this involves taking the corticosteroids every other morning and using other preventive measures to diminish long-term side effects. (For instance, to prevent osteoporosis, postmenopausal women should consider taking 1,000 to 1,500 mg of calcium per day and 400 units of vitamin D.)

Oral corticosteroids used for asthma control are not the same as anabolic steroids used by weightlifters and other athletes to build muscle mass. Oral corticosteroid medications are synthetic replicas of steroids produced in the body by the adrenal gland. Anabolic steroids are male hormones that have a very different effect in the body than oral steroids.

Other medications

Because inflammation and mucus in the upper airways, such as the sinuses, nasal passages and throat, can also affect the small airways in the lungs, medications to relieve these symptoms can also help your asthma. Allergic rhinitis — more commonly known as hay fever — causes congestion and runny nose, among other symptoms. The first line of treatment for mild symptoms of rhinitis is antihistamines and decongestants. Nasal corticosteroids (similar to inhaled corticosteroids for asthma, but delivered to the body as a nasal spray) may also be used in many cases. In severe cases, some of the same medications used in asthma may be prescribed, including oral corticosteroids.

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 possible side effects of the medications you use and how to minimize them
- Be sure to know whether one medication should be taken before another
- Follow instructions carefully; take the medication regularly, as directed by your doctor
- Carefully follow directions for using 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 healthcare provider if you should keep oral corticosteroids on hand for severe episodes
- Asthma symptoms change over time; keep your doctor informed of any changes that might affect your need for medication; dosages of asthma medication may need to be adjusted periodically
- Ask your doctor or pharmacist to check all new medications for possible interactions with any asthma medications you are already taking

Administering asthma medications

Inhaled asthma medications require special equipment to administer them properly. Sometimes the equipment is simply the container in which the medicine is packaged. But other items, such as spacers or nebulizers may be needed. Below are descriptions of the various systems fordelivering inhaled medications to the lungs.

Inhalers

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

- Poor timing between activation of the MDI and inhalation (for example, exhaling instead of inhaling at the moment when the medication is released)
- Inhaling too rapidly
- Neglecting to hold your breath briefly after inhaling the medication

- Not keeping the inhaler clean

MDIs may not work properly if cold. If your MDI is exposed to cold weather, warm it between 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. For example, a canister that contains 200 doses will last 25 days at a dose of four puffs twice a day (200 doses ÷ 8 puffs/day = 25 days). Shaking the container is not a good way to tell if any medication is left because aerosol propellants may remain 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, and keep the cap on the inhaler when not in use. Wash your inhaler (except Intal® and Tilade®) once a week in warm, soapy water, using a mild dishwasher detergent.

Nebulizers. Children too young to operate an inhaler are often treated with a machine called a **nebulizer**. This device is also ideal for adults who have difficulty using MDIs and for those with severe and unpredictable asthma episodes.

Nebulizers use compressed air to turn a solution of liquid medication — such as a bronchodilator, cromolyn sodium, or the corticosteroid budesonide (Pulmicort Respules®) — into a fine mist that can be easily breathed in through a mask or mouthpiece.

Nebulizers are normally found in doctors' offices and emergency rooms, but they can also be purchased for home use. A home nebulizer can help prevent a late-night trip to the emergency room. Many types of nebulizers are available, ranging from small battery-operated packs to machines that plug into a wall socket.

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

New devices. Many new devices for administering asthma medications have become available in the last 10 years or so, and new devices are continuing to be developed. The Turbuhaler® and Diskus,® which use inhaled powder medications, are among the most recent. Your doctor can provide further information on various options if an MDI or nebulizer does not meet your needs.

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 healthcare 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. A variety of spacers are available. If you don't have one on hand, 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 container to release a puff of medication, and breathe in slowly and deeply through your mouth.
5. Continue breathing in slowly for three to five seconds, until the lungs are full.
6. Hold your breath for 10 seconds to allow the medicine to be deposited in the lungs.
7. Usually the next puff can be taken right away, but in some circumstances a one-to-three-minute wait is advised before taking another puff. Check with your doctor for specific instructions for your medications.

Spacers

If you use an MDI, you will probably also need to use a **spacer**. Aptly named, the spacer is an attachment that extends the space between the inhaler and your mouth. Examples of spacers include AeroChamber,® InspirEase® or a plastic tube. Spacers make administering inhalants easier and allow more of the medication to penetrate deeper into the lungs. Without a spacer, inhaled medications tend to spray directly to the back of the throat and go no farther. Spacers are especially important in preventing **thrush**, a yeast condition that can be caused by inhaled corticosteroids. If your inhaler produces a coughing spell, talk with your doctor.

Asthma medications

Quick-relief Medications

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

Long-term Control Medications

Class of Medication	Generic Names *Available Forms*	How Does It Work?	Possible Side Effects	Miscellaneous Information/ Handling Side Effects
Corticostreoids: Inhaled	**beclomethasone dipropionate (QVAR®)** *Metered-dose inhaler (MDI)* **budesonide (Pulmicort® Turbuhaler,® Pulmicort Respules®)** *Dry powder inhaler (DPI), inhalation suspension* **flunisolide (AeroBid,® AeroBid-M®)** *MDI* **fluticasone propionate (Flovent,® Flovent® Diskus, Flovent® Rotadisk®)** *MDI, DPI* **triamcinolone acetonide (Azmacort®)** *MDI*	▪ Anti-inflammatory agent 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 ▪ 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®)** *DPI* **salmeterol (Serevent Diskus®)** *DPI*	▪ Relaxes the smooth muscles of the airways for as long as 10-12 hours	▪ Tremor, fast and/or pounding heartbeat, nervousness, 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®)** *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, tremor	▪ Do not use to relieve an acute asthma attack or acute symptoms
Leukotriene Modfiers	**montelukast sodium (Singulair®)** *Tablet* **zafirlukast (Accolate®)** *Tablet* **zileuton (Zyflo®)** *Tablet*	▪ Blocks the effects of some substances in your body that produce asthma symptoms (needs to be taken daily) ▪ Inhibits the production of some substances that produce asthma symptoms (needs to be taken daily)	▪ Similar to placebo (no medication) ▪ In rare cases, liver damage	▪ Must be taken daily to control symptoms ▪ Accolate should be taken one hour before or two hours after meals ▪ Use of Accolate requires monitoring if patients also use theophylline or warfarin ▪ Liver function tests need to monitored on a regular basis ▪ Theophylline, warfarin and propranol need monitoring if using Zyflo
Mast cell stabilizers	**cromolyn sodium (Intal®)** *MDI, solution for inhalation*	▪ Stabilizes the cells lining the airways, blocking the response to triggers (blocks inflammation)	▪ Throat irritation, cough, bad taste	▪ Very minor side effects ▪ Do not use to relieve an acute asthma attack or acute symptoms
Theophylline	**theophylline (eg, Slo-bid Gyrocaps,® Slo-Phyllin,® T-Phyl,® Theolair,® Theo-Dur,® Uni-Dur,® Uniphyl®)** *Capsules, tablets, syrup*	▪ Relaxes the smooth muscles of the airways, makes it easier to breathe ▪ Sustained release products last 12-24 hours/others 4-6 hours	▪ Nausea, vomiting, stomachache, headache, diarrhea, irritability, restlessness, trouble sleeping, muscle twitching, fast heart rate	▪ Important to take at prescribed times ▪ If you experience an increase in intensity of side effects, call your doctor ▪ Theophylline levels need monitoring ▪ Ask doctor about drug interactions

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 healthcare 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.

- 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 underway

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

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 healthcare 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.

Photocopy 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 healthcare provider. Because asthma and asthma action plans tend to change with time, photocopy 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 healthcare 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% or greater of personal best)

Symptoms:

- **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:

Name	Dose	How often

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% 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)
- 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:

   Name Dose How often

   _____

   _____
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% 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 healthcare 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

6. Asthma and exercise

- Many world class athletes have asthma, including swimmer Amy Van Dyken, NBA star Hakeem Olajuwon and NFL star Jerome Bettis
- 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

Many myths surround asthma and exercise. In the past, breathing difficulty was associated with frailty. Today medical professionals know that exercise benefits everybody — including people with asthma.

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 dryer 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, 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.

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.

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

Pretreatment for exercise-induced asthma

Your healthcare 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 exercised-induced asthma action plan on the next page.

Exercise-induced asthma action plan

Ask your healthcare 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:

Name	Dose	# of minutes before exercise

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 of smokers are more likely to develop asthma than children of non-smokers
- Children as young as four can help manage their own asthma

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 and school

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 healthcare 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.

- Women with well-controlled asthma have no more complications during pregnancy and giving birth than non-asthmatic women (Source: American Academy of Allergy Asthma Immunology [AAAAI])
- Uncontrolled asthma during pregnancy is associated with complications such as premature birth, low birth weight, and maternal blood pressure changes (Source: AAAAI)
- Most women with asthma can breast-feed since there is no evidence that the drugs currently used to treat asthma will harm the baby. Consult your physician to find out what is safe for you and your baby.

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, asthma improves for one-third of women, stays the same for another third and worsens for the remaining third.

Talk with your healthcare provider as soon as possible if you think you might be pregnant or if you are planning a pregnancy. Your healthcare 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 breast feed. Most asthma medications are safe to take during pregnancy and while nursing. Your healthcare 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 healthcare 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 feeling for everyone. If you or your child continue to struggle with emotions related to asthma, be sure to seek help. Your healthcare provider can recommend some helpful options — such as family or individual counseling, asthma support groups or other referrals.

Be especially certain to consult your healthcare 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, 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

The following organizations provide information and support services for people with asthma. While this list is a great starting point, there are many other resources available. Contact your doctor for more information.

American Academy of Allergy, Asthma, and Immunology

555 East Wells Street, Suite 1100
Milwaukee, WI 53202

414-272-6071

Asthma Information Line

1-800-822-2762

www.aaaai.org

American College of Allergy, Asthma and Immunology

85 W. Algonquin Road, Suite 550
Arlington Heights, IL 60005

1-800-842-7777

www.acaai.org

Allergy and Asthma Network/Mothers of Asthmatics, Inc.

2751 Prosperity Ave., Suite 150
Fairfax, VA 22031

1-800-878-4403

www.aanma.org

Asthma and Allergy Foundation of America

1233 20th Street NW, Suite 402
Washington, DC 20036

1-800-727-8462

www.aafa.org

American Lung Association

61 Broadway, 6th Floor
New York, NY 10006

212-315-8700

1-800-586-4872

www.lungusa.org

National Asthma Education and Prevention Program National Heart, Lung, and Blood Institute

P.O. Box 30105
Bethesda, MD 20824-0105

301-592-8573

www.nhlbi.nih.gov/about/naepp/

National Jewish Medical and Research Center

1400 Jackson Street
Denver, CO 80206

LUNG LINE® 1-800-222-5864

LUNG FACTS™ 1-800-552-5864

www.njc.org

Additional reading

Plaut, Thomas. **Children with Asthma: A Manual for Parents**. Amherst, MA: Pedipress, Inc., 1998.

Plaut, Thomas. **Dr. Tom Plaut's Asthma Guide for People of All Ages**. Amherst, MA: Pedipress, Inc., 1999.

Berger, William. **Allergies and Asthma for Dummies**. New York: John Wiley & Sons, 2000.

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

8. 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 Hypersensitivity to certain substances that is marked by allergic rhinitis (hay fever), asthma and eczema (dry, itchy skin).

Alveoli Structures of the lungs which 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 dilation of the air passages.

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 which 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 which are triggered by physical activity.

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

Long-term controller Medication which 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 anti-inflammatory asthma drug 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 which 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 gauge 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% or greater of personal best peak flow): greater than _____

Yellow Zone: (50 to 80% of personal best peak flow): _____ **to** _____

Red Zone: (Below 50% of personal best peak flow): less than _____

Medications: _____

_____

_____

Sample daily asthma diary

Date	PEF Readings am	PEF Readings pm	Number of Puffs of Rescue MDI/DPI	Symptoms				Possible Triggers
				Cough	Wheeze	Shortness of Breath	Chest Tightness	
8/4	540	420	0	1	1	0	0	cat exposure

Severity of symptoms

	0	1	2	3
Cough	None	Occasional	Frequent	Continuous
Wheeze	None	Some	Medium	Severe
Shortness of Breath	None	Some	Medium	Severe
Chest tightness	None	Some	Medium	Severe

Daily asthma diary

Date	PEF Readings am	PEF Readings pm	Number of Puffs of Rescue MDI/DPI	Symptoms				Possible Triggers
				Cough	Wheeze	Shortness of Breath	Chest Tightness	

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