Chapter 1

Knowing What's Ailing You

In This Chapter

- Connecting asthma and allergies
- Making sense of asthma signs and symptoms
- Defining the spectrum of asthma
- Determining how to properly manage asthma

According to many experts, asthma is now a global epidemic, and its prevalence and severity continue to grow in many parts of the world, primarily in highly developed countries, including the United States, Western Europe, Australia, and New Zealand. More than 17 million people in the United States have some form of asthma. That equals three times the number of asthma cases diagnosed in 1960, despite major medical breakthroughs during the last 40 years in diagnosing and treating airway obstruction — the basis of this disease.

One of the most important factors in this rising incidence of asthma may be an increase of indoor air pollution (see Chapter 2 for more information). In addition, according to a growing number of researchers, asthma's pervasiveness in countries with the most advanced public health systems could also be due to a combination of factors popularly referred to as the *hygiene hypothesis.* This hypothesis proposes that although modern day hygiene in much of the developed world has greatly reduced the incidence of childhood diseases and dramatically improved the well-being of the overall population, people may still benefit — especially as children — from some exposure to key types of bacteria and infections. In other words, a little dirt early in life may be good. The idea is that the human immune system is thereby primed to develop responses mainly against bacterial, viral, and parasitic infections rather than against otherwise innocuous allergens and other substances that trigger most patients' asthma symptoms.

Asthma through the ages

Through the ages, asthma has affected people from all walks of life, in all parts of the world. The Roman emperor Caesar Augustus was only one of many historical figures (see Chapter 22) who suffered from this serious respiratory disease. As far back as 2,500 B.C., Chinese doctors documented cases of asthma, as did chroniclers in many subsequent civilizations, including those of ancient Greece. In fact, *asthma* is the ancient Greek word for a classic symptom of this disease: panting or breathlessness.

Proponents of the hygiene hypothesis point to lower rates of asthma as well as allergies that afflict many asthma patients — mainly *allergic rhinitis* (hay fever) and *atopic dermatitis* (allergic eczema) — in less developed and rural parts of the planet. In those areas, living environments aren't often as hygienic as in the so-called first world, and infectious childhood diseases are more common. Because the hygiene hypothesis is finding increased support among health professionals in North America, Europe, Australia, and New Zealand, and is also a hot topic with most of my patients, I discuss it further in Chapter 6.

Although the mortality rates of other serious illnesses are declining, deaths due to asthma continue to rise. More than 5,000 Americans — many between the ages of 5 and 34 — die each year because of asthma. Most of these deaths, however, are clearly preventable. With proper diagnosis, effective and timely treatment, and an asthma management plan that empowers a person with asthma (and the patient's family) to control symptoms of the disease, most asthma patients can lead fulfilling and productive lives, free from the worry of life-threatening asthma attacks.

Understanding the Relationship between Asthma and Allergies

The vast majority of asthma patients also suffer from certain types of allergic conditions. In fact, a relationship exists between asthma and these allergic ailments, and it's vital for asthmatics, their families, and healthcare providers to understand the connections between, for example, the characteristic coughing and wheezing of asthma, and the sneezing and nasal congestion of a typical hay fever attack.

Asthma denotes a specific disease process of the lungs, while *allergy* is a descriptive term for a wide variety of hypersensitivity disorders (meaning that you're excessively sensitive to one or more substances to which most people don't normally react). Asthma and allergy share a strong bond, often coexisting as partners in disease. Effectively managing your asthma also requires understanding how an allergic condition may be affecting you. But always remember that asthma is the disease and allergies are one of the main causes.

Symptoms of seemingly disparate ailments such as most cases of asthma, allergic rhinitis, and atopic dermatitis, as well as some food allergies (see Chapter 8), basically result from your immune system's similar, hyperreactive response to otherwise harmless substances that doctors refer to as *allergens*. Think of asthma and allergy as two distinct avenues with major intersections, like Broadway and 42nd Street or Hollywood and Vine. In order to be an aware and involved patient, you often have to travel down both pathways.

The word *allergy* is the ancient Greek term for an abnormal response or overreaction. Contrary to popular belief, weak or deficient immune systems don't cause asthma or allergy ailments. Rather, your body's defenses work overtime, making your immune system too sensitive to substances that pose no real threat. That's why physicians often use the term hypersensitivity to refer to an allergy.

These are the main points to keep in mind when dealing with asthma and related allergies that cause it:

- **These ailments aren't infectious or contagious. You don't catch asthma or an allergy.** However, as I explain in "Sensitizing your immune system," later in this chapter, you may inherit a genetic predisposition to develop hypersensitivities that can eventually appear as asthma and/or allergies.
- **Asthma and allergies aren't like trends or shoe sizes. You don't really outgrow them.** Extensive studies over the past 15 years show that although your ailment can certainly vary in character and severity over your lifetime, asthma and allergies are ongoing physical conditions that are most likely always present in some form.
- **Allergic rhinitis often coexists with asthma and can affect your nose, ears, sinuses, eyes, and throat (see Chapter 7).**
- **Triggers of asthma and allergic rhinitis include allergens, such as pollens, animal dander, dust mites, mold spores, and, for some asthma patients, certain foods and drugs.** (See "Sensitizing your immune system," later in this chapter, for more detailed classifications of these items.)

- **Asthmatic reactions can also result from nonallergic triggers that act as irritants, including tobacco smoke, household cleaners, aerosol products, solvents, chemicals, fumes, gases, paints, smoke, and indoor and outdoor air pollution.**
- **Other forms of nonallergic triggers that primarily affect people with asthma are known as *precipitating factors.*** These factors include
  - Other medical conditions, such as rhinitis, sinusitis, gastroesophageal reflux disease (GERD), and viral infections (colds, flu)
  - Physical stimuli, such as exercise or variations in both air temperature and humidity levels
  - Sensitivities to food additives such as sulfites, drugs such as beta-blockers (Inderal, Lopressor, Corgard, Timoptic), and aspirin and related over-the-counter nonsteroidal anti-inflammatory drugs (NSAIDs), such as ibuprofen (Advil, Motrin), ketoprofen (Actron, Orudis), naproxen (Aleve), and newer prescription NSAIDs known as COX-2 inhibitors, including celecoxib (Celebrex) and rofecoxib (Vioxx)
- **When allergies affect the lungs, the resulting coughing, wheezing, and shortness of breath often manifest as symptoms of asthma.** However, allergies can also affect other organs of the body at the same time. Therefore, although allergic reactions can trigger symptoms of asthma, they can also simultaneously trigger symptoms of other allergic disorders, such as allergic rhinitis (mainly affecting your nose) and allergic conjunctivitis (your eyes).

- **All that wheezes, coughs, sneezes, drips, runs, congests, waters, itches, erupts, or swells isn't always due to an allergic reaction.** That's why, as I explain in the section "Managing Asthma Effectively," later in this chapter, the first step to receiving effective treatment is to have your ailment properly diagnosed (see Chapter 2 for a full discussion).
- **Although the majority of people with asthma also have allergies (allergic rhinitis in most cases), some manifestations of asthma seem to develop without an allergic component.** In cases of adult-onset asthma, which often develops in people older than 40 and is less common than child-onset asthma, *atopy* (a genetic tendency toward developing allergic hypersensitivity; see the next section) doesn't appear to play an important role. Instead, precipitating factors such as sinusitis, GERD, nasal polyps, and sensitivities to aspirin and related NSAIDs are more likely to trigger this condition (see Chapter 5).

Triggering Asthma and Allergic Reactions

Your immune system acts as your second line of defense against foreign substances. (The main barrier against foreign substances is your largest organ — your skin. Tuck that away in your brain for your next Trivial Pursuit tournament!) Usually your immune system protects you against infectious bacteria, viruses, parasites, and other harmful agents by producing antibodies that recognize the invaders and fend them off without too much fuss.

In fact, most of the time, as long as your immune system works well, you may not even know that this constant, ongoing process takes place to ensure your survival and good health. However, with an allergic condition, your immune system overproduces antibodies against typically harmless or inoffensive substances such as pollens.

Sensitizing your immune system

A complex sensitization process, in which your immune system responds to allergens, causes allergic reactions that often affect asthma patients. Allergens that your immune system may respond to include the following:

- Dander from many animals, including cats, dogs, rabbits, birds, and horses, as well as gerbils and other pet rodents (see Chapters 5 and 10)
- Dust mites (see Chapter 10)
- Foods, including milk, eggs, peanuts, tree nuts, fish, shellfish, soy, and wheat (see Chapter 8)
- Mold spores (see Chapter 10)
- Pollens from certain grasses, weeds, and trees (see Chapter 10)

Approximately 10 percent of asthma patients also have sensitivities to aspirin, aspirin-containing compounds (such as Alka-Seltzer, Anacin, and Excedrin), and other NSAIDs.

Developing an allergic reaction

If you're predisposed to developing asthma and/or allergies, here's how a typical sensitization process and allergic reaction can develop, using ragweed pollen, one of the most common triggers of allergic rhinitis, as an example (you can find more details about this process in Chapter 6):

1. **Ragweed pollen enters your body, usually as a result of inhaling it through your nose.**
2. **Your immune system detects the presence of these foreign substances in your body and reacts by producing *IgE antibodies,* a special class of antibodies.**
3. **IgE antibodies attach themselves to the surfaces of mast cells that line tissues throughout your body, especially in your nose, eyes, lungs, and skin.**
4. **Your body designs IgE antibodies to counter specific substances.**

   Your immune system is a magnificent memory machine: Unlike you or me, it hardly ever forgets a face. After sensitization occurs, you'll likely experience allergies to that substance for most of your life. With ragweed, for example, your immune system produces specific IgE antibodies with receptor sites that allow ragweed allergens to cross-link two of the IgE ragweed-specific antibodies. The IgE antibodies work like a lock on the mast cell surface, and the allergen is the key. When the ragweed allergen connects with two IgE antibodies on the mast cell surface, the union of all three (allergen, antibody, and mast cell) results in the cell releasing its chemical contents.
5. **Unlocking the mast cell initiates the secretion of histamine, leukotrienes, and other potent chemical mediators of inflammation as a defensive response to the allergen.**

   In turn, the actions of these chemicals trigger the swelling and inflammation that result in familiar allergy symptoms.

All in the atopic family

Your genetically determined allergic predisposition (*atopy*) may present itself through different allergic conditions and target organs. This predisposition and a family history of allergies are the strongest predictors that you may develop asthma and/or other allergic conditions such as allergic rhinitis (hay fever), atopic dermatitis (allergic eczema), and food or drug hypersensitivities.

For example, your Uncle Ed may have allergic rhinitis, your sister Sally may suffer from recurrent sinus and ear infections, and cousin Al may have a childhood history of atopic dermatitis. Some of your especially unlucky relatives may even be "blessed" with a combination of all these allergic conditions, plus asthma, over the course of their lifetime. (If you want to be the most popular member of your family, buy them a copy of this book.)

A typical atopic family history could consist of a person having atopic dermatitis as an infant, developing common atopic complications such as otitis media (ear infections — see Chapter 13) as a toddler, experiencing noticeable symptoms of allergic rhinitis in later childhood, and then developing asthma as a teenager.

Doctors frequently use antihistamines to relieve allergy symptoms because histamine plays such an important role in the inflammatory process. In addition, as I explain in Chapters 12 and 15, in the last two decades, government-funded and pharmaceutical researchers have developed more specialized drugs to counter and/or inhibit some of the more fundamental allergic processes. In particular, inhaled corticosteroids, mast cell stabilizers, leukotriene modifiers, and anti-IgE antibodies (see Chapter 15) provide new therapeutic approaches to preventing and controlling symptoms of asthma and other allergic reactions.

Previewing Asthma and Related Conditions

Consider this part of the chapter a preview of coming reactions. In the following sections, I summarize the significant features of the most common types of asthma, as well as hay fever and allergic eczema, and provide important details about distinguishing them from nonallergic conditions that are similar. I also include references to the chapters where I discuss these ailments in more detail.

Asthma: Breathing and wheezing

The most fundamental definition of asthma is a chronic, inflammatory airway disease of the lungs that causes breathing problems. However, in practice, asthma has many faces and is often difficult to recognize and properly diagnose. As a result, even though currently available prescription medications offer effective ways of relieving, preventing, and controlling the symptoms and underlying *inflammation* (redness, swelling, and congestion that characterize asthma), the disease continues to cause serious problems for many people worldwide.

Inflammation of the airways (bronchial tubes) is the most important underlying factor in asthma. In the vast majority of cases, if you have asthma, your symptoms may come and go, but the underlying inflammation usually persists.

Asthma's characteristic symptoms are

- Chest tightness
- Productive coughs (coughs that produce mucus)
- Shortness of breath
- Wheezing

Important symptoms of asthma in infancy and early childhood include wheezing, persistent coughing, and recurring or lingering chest colds. (Because of its symptoms, asthma in children is often misdiagnosed as recurring bronchitis, recurring chest colds, or lingering coughs.)

In an overwhelming number of cases, asthma is a manifestation of *atopy* (the genetic tendency toward developing hypersensitivity to allergens). In fact, many people with asthma also have allergic rhinitis. The hyperreactive response of the sensitized immune system to asthmatic triggers (typically inhalant allergens, such as dander and dust mites, as well as other substances, including irritants, that also trigger allergic rhinitis symptoms) causes the underlying airway inflammation (see Chapter 5 for a detailed explanation of this process).

Allergic rhinitis: Running away with your nose

Frequently referred to as hay fever, allergic rhinitis is the most common allergic disease in the United States. As many as 45 million Americans or more suffer from some form of this allergy, which often coexists with asthma. Trademark symptoms of allergic rhinitis include

- Runny nose with clear, watery discharge
- Sneezing
- Stuffy nose
- Postnasal drip
- Itchy nose, ears, palate, and throat

In addition, itchy and watery eyes, symptoms of allergic conjunctivitis, are often associated with allergic rhinitis. Infections of the middle ear (otitis media) and of the sinuses (sinusitis) are frequent complications of allergic rhinitis.

Part III includes several chapters on the many forms of allergic and nonallergic rhinitis, as well as the ways doctors diagnose and treat these ailments, important tips on avoiding triggers of various types of rhinitis, details on medications, and information on the complications of allergic rhinitis symptoms.

It's in your airways, not in your head

For centuries, many people believed that psychological factors such as anxiety, emotional disorders, or stress caused asthma. However, although these problems can *aggravate* asthma or allergies, they don't *cause* asthma or allergies. Unfortunately, I still hear about the friends and family of asthmatics who claim that asthma is all in the patient's head. Some of these people insist that if the person would just calm down, his or her condition would go away. Actually, instead of stress causing asthma, it can be the other way around: Breathing problems can cause stress. Stressing out because you can't breathe is a perfectly normal and understandable response.

Therefore, a proper diagnosis of asthma and/or allergies and early, aggressive treatment for these conditions are crucial. In most cases, you should be able to control your asthma and allergy condition so that it doesn't control you, thus enabling you to lead a full and active life. Forget the negative stereotypes of asthmatics and people with allergies as nerdy, weak, anxious types, forever coughing and blowing their noses. Asthma and allergies can affect anyone: from the captain of the school chess team to the captain of the football team, as well as everybody in between.

Atopic dermatitis: Scratching your itch

Also described as atopic eczema or allergic eczema, *atopic dermatitis* is an allergic condition that targets your skin. The simplest way to define this noncontagious skin condition is the itch that rashes (or the "itch that scratches").

"The itch that rashes" is a result of the itch-scratch cycle, the hallmark of atopic dermatitis. Scratching your dry skin causes it to rash, leading to more irritation and inflammation, further damaging your skin and making it even itchier — resulting in more scratching and increasingly irritated skin. Eventually, fissures and cracks can develop on your skin, allowing irritants, bacteria, and viruses to enter, often leading to complicating infections.

Atopic dermatitis frequently occurs with allergic rhinitis and can also precede other allergic symptoms. As such, atopic dermatitis can provide an early clue that you're at risk of developing other allergies and asthma.

Food hypersensitivities: Serving up allergens

Most adverse food reactions aren't the result of true *food hypersensitivities* (the more precise term for food allergies). In fact, various forms of food intolerance,

food poisoning, and other nonallergic mechanisms cause the majority of reactions that most people blame on food allergies.

The most frequent triggers of actual food hypersensitivities are proteins in the following foods:

- Cow's milk, including products that contain casein and whey
- Eggs, especially egg whites
- Fish, both freshwater and saltwater
- Peanuts and other legumes, including soybeans, peas, lentils, beans, and foods containing these ingredients
- Shellfish, including shrimp, lobster, crab, clams, and oysters
- Tree nuts, including almonds, Brazil nuts, cashews, hazelnuts, and walnuts
- Wheat and other grains and cereals, such as corn, rice, barley, and oats

In cases in which mouth and lip swelling, wheezing, or hives occur immediately after consuming a particular food (peanuts, for example), you may easily deduce that an allergic process caused your reaction. However, in many other instances, distinguishing between food intolerance and true food hypersensitivity can require more extensive diagnostic procedures. If you're hungry for more information on adverse food reactions, see Chapter 8.

Drug hypersensitivities: Taking the wrong medicine

Certain drugs are prone to produce allergic reactions in susceptible individuals. The most frequent type of adverse allergic reactions to medications occurs with penicillin and its related compounds. Aspirin and related NSAIDs — including newer prescription NSAIDs, known as COX-2 inhibitors, such as celecoxib (Celebrex) and rofecoxib (Vioxx) — and other drugs can also trigger adverse reactions. However, as with adverse food reactions, most adverse drug reactions result from nonallergic mechanisms.

Although drug hypersensitivity reactions most frequently target the skin, adverse allergic reactions to drugs can affect any part of your body, including mucous membranes, lymph nodes, kidneys, liver, lungs, and joints. These reactions can include skin rashes, hives and *angioedema* (deep swellings), respiratory symptoms such as coughing or wheezing, fever (sometimes resulting in drug fever, occasionally with shaking chills and a skin rash), and low blood pressure and/or anemia, resulting from an adverse reaction that destroys your red blood cells.

In less frequent but more serious cases, an adverse drug reaction can result in *anaphylaxis,* a severe, potentially life-threatening response that affects many organs simultaneously (see the next section). In fact, penicillin injections cause most drug-related anaphylactic deaths in the United States. (Fortunately, the use of penicillin shots has significantly decreased in recent years.)

Anaphylaxis: Severe systemic symptoms

Anaphylaxis, an ultimate but thankfully rare form of allergic reaction that seldom affects asthma patients, is a severe, potentially life-threatening response that affects many organs simultaneously. The characteristic signs of anaphylaxis include

- Difficulty breathing
- Dizziness or fainting
- Dramatic itching over the entire body
- Flushing (sudden reddening of skin)
- Itchy rash or hives
- Nausea, vomiting, abdominal pain, and/or diarrhea
- Severe drop in blood pressure
- Swelling of the throat and/or tongue (limbs may also swell)

Significant causes of anaphylaxis in the United States include

- Foods — particularly peanuts and shellfish
- Venom from stinging insects of the *Hymenoptera* order (honeybees, yellow jackets, wasps, hornets, and fire ants)
- Drugs such as penicillin and related compounds
- Exercise, including food-dependent exercise-induced anaphylaxis (see Chapter 9 for more information)
- Latex, by direct contact with the skin or by inhalation (most often by breathing in corn starch powder used in some latex gloves — see Chapter 5)

In addition, pseudoallergic reactions caused by drugs such as aspirin or related OTC NSAIDs like ibuprofen (Advil, Motrin), ketoprofen (Actron, Orudis), naproxen (Aleve), and newer prescription NSAIDs, known as COX-2 inhibitors, including celecoxib (Celebrex) and rofecoxib (Vioxx), can (in some cases) lead to severe, potentially life-threatening reactions referred to as *anaphylactoid reactions.* These reactions are immediate, systemic reactions that closely resemble anaphylaxis but aren't caused by IgE-mediated allergic responses.

Dyeing your allergies

Inhaled corticosteroids, which are often used as asthma and allergic rhinitis treatments — including budesonide (Pulmicort, Rhinocort Aqua), fluticasone (Flovent, Flonase), and other inhaled corticosteroid products that I list in Chapter 15 — are extremely effective in suppressing the inflammatory process that is the hallmark of asthma. Keep in mind, however, that most asthma and allergy drugs treat the end result of a long, complex chain of immune system reactions but don't fundamentally prevent the underlying process causing your ailment. Therefore, if you stop taking your prescribed medications, the underlying disease process most likely restarts and your symptoms reappear.

I compare this process to dyeing your hair. You can change your hair color, but if you don't continue coloring it (like treating your asthma and allergies with your prescribed medicine), your new hair growth comes in with its original color, because you haven't really altered its underlying, genetically determined characteristics.

If you're at risk for anaphylaxis, be prepared to take emergency measures to prevent this type of extremely serious reaction. Consult with your doctor about prescribing an emergency kit (such as EpiPen) that contains an injectable dose of epinephrine.

Make sure that your doctor shows you how to use the kit. Finding out the proper technique for administering epinephrine in your physician's office is much more effective than trying it out for the first time while you're having a reaction.

Because anaphylaxis is such a serious issue and can result from various types of exposures, I address it throughout the book, wherever applicable.

Managing Asthma Effectively

In most parts of the world, asthma causes a wide range of problems for millions of people. Asthma can present as an occasional minor symptom, as a serious episode or attack, and even as a potentially life-threatening reaction (in the most severe and rare cases). However, thanks to recent medical breakthroughs, properly diagnosing what's ailing you and developing an appropriate and effective treatment plan for controlling your symptoms and managing your condition is now possible.

Effectively managing allergic conditions — particularly asthma and allergic rhinitis — frequently requires dealing with an assortment of symptoms, treatments, and preventive measures, because allergies and asthma and several related allergic conditions tend to be ailments with many faces. Think of a typical Chinese restaurant menu: You may need to order dishes from different columns in order to have a complete meal.

The basic components of effectively managing asthma and allergies include the following steps:

- **Getting a proper diagnosis.** Identifying the specific allergens, irritants, and/or precipitating factors that may trigger your ailment is a critical component of your diagnosis. Cough medicine isn't the treatment for your cough if you have asthma. First finding out why you're coughing (a cough may be the only obvious symptom of underlying asthma in certain patients) is vital so you can then take appropriate steps to effectively control and manage your condition.
- **Avoiding or reducing exposures to allergens, irritants, and precipitating factors that may trigger your asthma and/or allergies.** Effective avoidance and allergy-proofing measures (see Chapters 5 and 10) can significantly improve your quality of life and often reduce, or in certain cases eliminate, your need for medication.
- **Taking long-term preventive medications to control your underlying condition while appropriately using short-term medications when you experience flare-ups, episodes, or attacks.** (I provide extensive information on prescription and OTC asthma and allergy products in Chapters 12 and 14–16.)
- **Evaluating and monitoring your condition.** When you're initially evaluated, pulmonary testing should be done. At home, you can monitor your lung functions with a peak-flow meter (see Chapter 4 for details on managing asthma long-term).
- **Adhering to your treatment plan (see Chapter 2) and keeping yourself informed about all aspects of your condition.** Make sure you have an action plan to deal with any worsening of symptoms and read educational materials that your physician provides (especially this book!).
- **Keeping yourself in good general health to avoid developing more severe symptoms or potential complications of your ailment and to help you enjoy the highest quality of life possible.** Lead an active, healthy lifestyle, including eating right, getting plenty of exercise, and having regular checkups with your general physician.