ALLERGIES:
MORE THAN A SNEEZE

Course #2021

10 Contact Hours

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About the Author

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Purpose and Goals

The goal of the enclosed course is for you to learn the growing problem of allergies, including current recommendations on diagnosis and management of various allergic diseases. Antibody-antigen reactions, medications, treatments, and patient education strategies are discussed, as well as complementary therapies that help alleviate the bothersome symptoms that plague the allergy sufferer.

Instructional Objectives

Upon completion of this course, the learner will be able to:

1. State the medical definition of “allergy.”
2. Outline the immunologic basis upon which antigen-antibody reactions occur.
3. Describe how antibodies are formed in the body.
4. Outline the FOUR distinct types of allergic reactions.
5. List the FIVE major types of immunoglobulins normally present in adults.
6. Distinguish between a complement, receptor and mediator as they relate to sensitization.
7. Define what makes a substance allergenic.
8. List the trigger mechanisms in tissue hypersensitivity.
9. Demonstrate a basic knowledge of the diagnostic procedure necessary to confirm the presence of allergic disease.
10. Identify and outline the process of food allergy development and treatments to alleviate symptoms.
11. Recognize factors to consider in prophylaxis of seasonal and perennial allergic rhinitis.
12. Outline a regimen for symptomatic treatment of seasonal and perennial rhinitis.
13. Differentiate between atopic dermatitis and allergic contact dermatitis and name the generalized treatments.
14. Define anaphylaxis and list the general signs and symptoms.
15. Define the course of treatment for immunotherapy.
16. Outline how complementary/alternative therapies are effective in allergy treatment and prevention.

Introduction

In 1906, a physician, Clement Von Pirquet, coined the term from two Greek words allos meaning “changed or altered state” and ergon meaning “reaction or reactivity”, implying a hypersensitivity to a specific substance(s) that does not cause symptoms in most people. Allergy is defined as an adverse physiologic or biologic reaction resulting from interaction of antigen and humoral antibody or lymphoid cells and occurring in a host sensitized by prior exposure to the antigen. Any study of allergy must be based on the immunological process, the root of all allergic reactions.
**Understanding Allergic and Antigen-Antibody Reactions**

With every breath we take, we breathe in millions of microscopic particles such as dust, pollen, plant spores, viruses, bacteria and even pollutants in the form of chemicals in the air or substances that come into contact with the skin and mucous membranes. Many of these particles are filtered and removed by the nose and respiratory system, while others enter the body. If the immune system is strong and healthy, it can ward off infection against pollutants, viruses and other harmful substances that may enter the body via the air or by contact with the skin.

Normally the immune system will ignore harmless substances entering the body (e.g. pollen, house dust, animal dander, etc). In some people, however, the immune system misinterprets these harmless particles and identifies them as being dangerous to the system. Allergies are often described as a “body war.” It was originally thought of as a “state of altered reactivity.” Current usage employs the term for adverse or harmful reactions resulting from interaction of antigen (allergen) with circulating antibody or lymphocytes, while “immunity” describes the protective mechanisms exhibited by the body in response to second exposures to antigens such as bacteria, viruses and fungal agents. The designation of a substance as an “allergen” suggests an adverse or damaging response to the body, which has been challenged by introduction of the allergen; antigens, on the hand, may cause either harmful or protective responses.

An antigen is a substance that causes the formation of antibodies by the body. The introduction of a particular antigen into the body by inhaling it, eating or drinking it, or having it injected may be followed by the induction of an immune response; the body is then considered to be immunologically altered. Any response following further exposure to the antigen has a definite specificity that results in either a protective function or a harmful outcome causing tissue injury.

**Cell Production**

In order to understand how antigen-antibody reactions occur, it is necessary to review the immunologic basis of these reactions and to understand where the involved cells of the body come from and how they interact with each other.

All blood cells in the body started out from the bone marrow. “Stem cells” in the marrow, give rise to the blood cells. All cells come out of the marrow as stem cells. Then, depending on which part of the body they migrate, they become different types of blood cells. This can be visualized in Figure 1.

In the appendix and gut there is a lot of lymphoid tissue called “GALT” or Gut Associated Lymphoid Tissue. Antibodies are formed there from the reaction of the B-cells (B-lymphocytes) with an antigen. The stem cells, formed in the marrow, migrate to the GALT and are “educated” to become B-cells. B-cells are responsible for humoral immunity.

If the stems migrate to the thymus, however, they are “educated” to become “T” cells. T-cells are responsible for cellular immunity. Cellular immunity refers to the body’s reaction to antigens by cells rather than by antibody molecules present in the fluids. A generalized scheme of the immune system follows in Figure 2.

For our purposes it is enough to accept that the cells responsive to antigens in the formation of antibody immunoglobulins are called

```
Thymus ----------- T-cell ------------ Antigens ------- Killer Cell
GALT, Bone Marrow
Fetal Liver ------- B-Cell ----------- Antigens ------- Plasma - Antibodies Cells
Bone Marrow
or Spleen ------- Pre-Myelomonocyte ----- Leukopoietins ---- Monocyte Granulocyte
(PMN)
Bone Marrow
or Spleen ------- Pre-Erythrocyte ------- Erythropoietin ---- Erythrocyte (Red Blood Cell)
Bone Marrow
or Spleen ------- Pre-Megakaryocyte --------- Megakaryocyte
Bone Marrow ------- Pre-Basophil ------------------ Basophil (Mast Cell)
Bone Marrow ------- Pre-Eosinophil ---------------- Eosinophil
```

**Figure 1**
B-cells. Some B-cells develop into immunoglobulin secreting cells (plasma cells). In contrast, the cells responsible for mediating specific cellular immunity are called T-cells. Upon initial contact with antigens these cells appear to increase in number and always remain identifiable as lymphocytes. For the induction of antibody responses to certain antigens a cooperation between B-cells and T-cells is necessary. Antigens inducing these responses as well as resultant antibody responses are called T-cell-dependent or thymic-dependent antigens.

**Immunologic Reactions**

There are FOUR distinct types of immunologic reactions underlying tissue injury. A review of these mechanisms is necessary to understand the basic principles that will be used to treat the various forms of allergy. Immunologic Types 1 through 3 involve immunoglobulins.

Immunoglobulins are a family of closely related, though not identical, proteins capable of acting as antibodies. Five major types of immunoglobulins are normally present in human adults: IgA, IgD, IgE, IgG and IgM.

IgA is the principal immunoglobulin in exocrine secretions such as milk, respiratory and intestinal mucin, saliva and tears. This is probably important to the protection of mucosal surfaces from invasion by pathogenic bacteria.

IgE is a gamma globulin produced by cells of the lining of the respiratory and intestinal tracts. IgE is important in forming reaginic antibodies.

IgG is the principal immunoglobulin in human serum. Because it is the only one that moves across the placental barrier it is important in producing immunity in the infant prior to birth.

IgM is a globulin formed in almost every immune response during the early period of the reaction.

Type 1 immune reactions represent the immediate hypersensitivity reaction, mediated by IgE antibody and causes the release of chemical mediators that produce signs and symptoms of allergic reactions as typified by allergic rhinitis, urticaria, eczema and extrinsic bronchial asthma. Homocytotropic antibody is required in Type 1 immune reactions. As a result of a combination of this tissue-fixed antibody with antigen, certain chemical mediators are released into the blood stream. These chemical mediators are histamine, serotonin, bradykinin and a slow-reacting substance of anaphylaxis (SRS-A); they have the potential to induce the responses associated with immediate hypersensitivity such as smooth muscle contraction, local increase in vascular permeability (dilation) and increased mucous secretion that mark the signs and symptoms of anaphylaxis.

Histamine, a vasoactive amine, is found in the tissues of mammals, mainly in the granules of mast cells located in perivascular connective tissue. There are an abundance of mast cells in the lung. Histamine is secreted from the mast cell by interaction of the reaginic homocytotropic antibody with a specific antigen on the mast cell’s surface.

Serotonin, like histamine, is a potent vasoconstrictor. This is a naturally occurring derivative of tryptophan found in platelets and in cells of the brain and intestine.

Kinins are peptides formed by the enzymatic action of kallikrein on the alpha globulin plasma substrate kinogen. Therefore, bradykinin is not stored but is formed after an immune reaction takes place. Bradykinin causes vasodilation, bronchial smooth muscle contraction and increased capillary permeability.

SRS-A is an acidic lipid whose chemical structure is unknown. It is active in the presence of...
antihistaminic and antiserotonin agents and is not affected by agents that destroy bradykinin. SRS-A is, therefore, distinct from the other mediators. In humans, SRS-A has a chemical significance because it is released from the lungs of allergic individuals when a specific antigen is introduced into the lungs. Human bronchi-ole tissue is extremely sensitive to the property of this chemical, which causes bronchiole tissue to constrict and antihistamines are of limited value in controlling allergic bronchospasm.

SRS-A is released from sensitized mast cells when the antibody is IgE reaginic antibody.

Why Are Some People Allergic, While Others Are Not?

The bodies of normal individuals develop a natural or acquired immunity to allergens, but in less fortunate individuals the immune system may be overly sensitive to foreign substances and to others produced naturally by the body. The body normally protects itself against allergens or antigens by the complex chemical reactions of the humoral immune and cell-mediated immune systems. Children are more likely to develop allergies if their parent(s) have allergies. To understand the basic cellular reactions of an allergic person, we must have some idea of how body cells differ in the allergic vs. non-allergic person. We must understand how sensitization takes place.

Sensitization

Sensitization is defined as an acquired reaction in which specific antibodies develop in response to an antigen.

Complement is a substance or body producing bacteriolysis or hemolysis that is connected with an animal or bacterial cell. It is present in all sera. Strictly speaking, complement is not an antibody but a “natural” property of blood.

A receptor may be generally described as a specialized reacting surface of a cell (in allergy, the cell is a mast cell or a circulating basophil). Receptors have the ability to bind with immunoglobulin E (IgE) molecules. Receptors also react with certain drugs or hormones to produce the response of regulation of the release of substances termed mediators that are normally held within the cell.

A mediator is a chemical substance that induces activity in an excitable tissue, such as muscle or nerve. In allergy the term refers to chemical substances held within mast cells or circulating basophils, i.e., histamine, slow- reacting substance of anaphylaxis (SRS-A) and eosinophil chemotaxis factor of anaphylaxis (ECF-A).

In allergic sensitization an external antigen enters the body through some opening or because of weakened resistance in the skin or mucosa of the respiratory tract or gastrointestinal tract.

Plasma cells capable of forming IgE (antibody) lie just within the lining of the skin or mucosa. The antigen acts on the plasma cell and causes it to produce IgE. The IgE molecules in turn, leave the plasma cell and attach firmly to mast cells in circulating basophils. The person is now allergically sensitized. (Figure 3)

Once a person has been allergically sensitized, he may be exposed to the same antigen causing the sensitization again. As before, the antigen will enter through the skin or mucosa. But now the mast cells are sensitized with IgE molecules firmly attached to their surfaces. (Figure 4)

Once a specific antigen touches...
There are a number of receptors on the cell surface. These include alpha- and beta-adrenergic receptors, cholinergic receptors and prostaglandin receptors. Stimulation of these receptors can regulate the formation and release of the chemical mediators, such as histamine, etc., held within the cell.

It is believed that these receptors regulate the release of mediators by influencing the intracellular level of the cyclic nucleotides, cyclic adenosine monophosphate (c-AMP) and cyclic guanosine monophosphate (c-GMP).

However, it should be understood that c-AMP inhibits the release of histamine and other mediators from the cell and causes smooth muscle relaxation. On the other hand, c-GMP stimulates the release of histamine and other mediators and causes smooth muscle contraction.

This knowledge is of considerable value in the modern therapy of asthma and other allergic diseases. Many of our most effective therapeutic agents, such as isoproterenol, isoetharine, metaproterenol and terbutaline, produce improvement in allergic symptoms by their actions on the beta adrenergic receptors, which cause increased c-AMP production and bring about decreased mediator release from the cells and smooth muscle relaxation.

It should be noted that not all allergic symptoms are triggered by allergens. Sometimes non-immunologic factors, such as exercise, air pollution, sudden changes of temperature, low humidity or infection will be the cause.

The definition as well as the demonstration of the existence of an allergen depends on an immune reaction occurring in a living organism. The immediate hypersensitivity reaction in individuals is initiated by the interaction of two equally important components, the allergenic molecule and the corresponding antibody molecules of the IgE class.

**What Makes A Substance Allergenic?**

The combination of cell-bound IgE antibodies with the complementary allergenic molecules is essential for the allergic reaction, whereas allergen combining with circulating antibody is at the present not known to have any biological significance. The immune reaction on the mast cell surface triggers certain intracellular events, resulting in the release of biochemical mediators and agents that are able to activate extracellular mediator systems.

The mediators act as excitatory stimuli on smooth muscles and glands, resulting in quite complex allergic inflammatory tissue reactions. The mediator release may, to a certain extent, be regulated by complex biochemical feedback mechanisms and by a number of drugs.

Low concentrations of IgE, both on mast cells and in serum, are normally present in all individuals and all of us are exposed to a vast number and variety of environmental antigens. However, only a portion (10-30%) of the population, under natural conditions of exposure, becomes allergic with overt clinical symptoms (allergic or “atopic” individuals). It is conceivable that the rest of the population (the so-called nonallergic or “non-atopic” individuals) also respond to stimuli with IgE antibody production in some way but without recognizable allergic symptoms. IgE antibodies without clinical significance are found in allergic individuals, who are allergic to a number of food components and can be raised in nonallergic individuals following repeated infections with allergenic material. IgE without demonstrable antibody activity is sometimes referred to as “physiological IgE,” a term which could also mean IgE antibodies are responsible for clinical disease (or allergic symptoms).

A significant number of people exposed to the same environmental substances develops allergies. This indicates that host factors contribute to or determine whether a given environmental substance or certain molecules act as allergens or not. Important host factors in this respect appear to be the immune responsiveness (IR) within different systems, particularly within those involving IgE. In addition, a number of non-immunological or so-called “conditioning” factors, appear to influence the localization and degree of immunological sensitization as well as the type and degree of clinical symptoms.

The responsiveness in the IgE system is thought to be influenced by at least two distinct genetic factors, i.e., by genes regulating the general responsiveness in IgE production and also by genes regulating the antigen specific response. Those trying to determine just what occurs in the genetics-allergies field are faced with complex interactions between the different immunoglobulin systems and the working together or the competition between different cells during various stages of allergic stimulation.

Only people whose genetic code is strongly programmed to produce IgE antibodies will do so under normal low-dose environmental conditions that can include inhaling a substance or eating it as a part of food and subsequently developing an allergy. If not so programmed, the individual produces IgG antibodies instead of the IgE antibodies. These IgG antibodies serve to neutralize the antigens and bind them up; bound up antigens are then cleared out of the reticuloendothelial-
endothelial system.

It is important to pause here and state that nonimmunological factors – particularly a biochemical defect of some sort which results in the over-reactivity of the tissues in question – seem to be necessary for the development of allergic disease. It is also important to keep in mind that an allergic individual does not inherit specific allergies from his or her parent(s); rather, it is the tendency to develop allergies that is inherited.

Before a person can become allergic to a substance, exposure must occur. The substance must be present in substantial amounts and preferably over prolonged periods, in the patient’s environment or food.

On the other hand, there are many substances which are quite abundant in inhaled air or in food but do not cause allergy. Pine pollen is an example of this in the Scandinavian countries. It does not cause allergies because of the structure of the pollen grain itself. The pulp of the antigenic proteins is encased in a tough cellulose layer that is resistant to the enzymes of the human respiratory passages. The pollens are excluded from the respiratory passages and no antigenic material comes in contact with the mucosa.

The ease with which the antigenic material reaches the mucosa seems to be one of the factors that determines what makes an allergen an allergen. For pollen, the rate of release from the pollen grain may have an important bearing on the allergenicity of the different proteins the grain contains. The major allergen of birch tree pollen and the most important rye grass pollen allergens are released very rapidly from the pollen grains.

In addition, the molecular charge of the molecule that causes allergic responses is important.

Antigenic activity in IgA, IgM and IgG may be associated with proteins and carbohydrates (and to a certain extent – lipids). Allergenicity in IgE is exclusively associated with proteins or polypeptides as far as we currently know.

If we were to design a “model” allergen, it would be a protein or blood-bound substance, with a molecular weight below 70,000, which reacts with specific antibodies of the IgE class.

Nevertheless, even if a substance in our individual environment was exactly like the model we have constructed, a person would not necessarily show symptoms of allergy unless he were already likely to develop an allergy. This inclination could be the result of heredity or frequent prior exposure.

### Allergic Reactions

There are four types of allergic reactions:

**Type I:** Anaphylactic Reagin, (IgE) – Dependent

Initiated by reaction of an allergen with previously sensitized mast cells or basophils and leading to release of chemical mediators (vasoactive amines) responsible for the manifestations of the immediate, wheal-reacting allergies. EXAMPLES: Hay fever, asthma, allergic rhinitis and atopic dermatitis.

**Type II:** Cytotoxic or Cytolytic, Anti-tissue Antibodies

Initiated by antibody reaction with:

a. An antigenic component of a cell or tissue element or,

b. An antigenic or hapten that has become intimately associated with cell or tissue elements.

Reaction usually requires the participation of complement. EXAMPLES: Hemolytic disease of the newborn, Immune thrombocytopenia, Goodpasture’s glomerulonephritis.

**Type III:** Antigen-Antibody Complex Disease

Complexes of antigen and antibody, formed in moderate antigen excess, remain soluble and are locally toxic to tissue. With antibody excess, complexes are precipitated and easily eliminated unless they occur in very high local concentration or in membranes with an essential filtration function. Complement is usually activated. EXAMPLES: Drug reactions (i.e. penicillin), serum sickness and some forms of nephritis.

**Type IV:** Cell Mediated Responses (Delayed-Type Hypersensitivity)

These reactions involve T lymphocytes that have been sensitized to locally deposited antigens. The reaction is mediated by release of lymphokines, direct cytotoxicity, or both. Delayed hypersensitivity is caused by immunoglobulins such as IgE. EXAMPLES: Tuberculin hypersensitivity, contact dermatitis (e.g., poison ivy) inflammation.

### Diagnosing Allergic Diseases

It is necessary to first decide whether it is an allergy that is causing the patient’s symptoms. People with allergy symptoms, such as a runny nose, may at first suspect they have a cold – but the “cold” lingers. If the patient’s medical history indicates their symptoms recur at the same time each year, the medical staff will work under the theory that a seasonal allergen (like pollen) is involved. Additionally, the mucous membranes will often appear swollen and pale or cyanotic in those with allergic conditions.

While allergy may be the cause of the above conditions, other factors may also cause rhinitis, asthma and dermatitis, as well
as the other “classic” symptoms of allergy. If the patient has an autonomic imbalance and under-functioning of the beta-receptors, the resulting tissue hyperactivity may be triggered not only by antigen-antibody interaction but by a number of other stimuli as well. The following list contains the major trigger mechanisms.

**Trigger Mechanisms in Tissue Hyperactivity**

Allergy; Infection; (More likely to be viral than bacterial); Meteorological Factors (Cold, Changes in weather, temperature, humidity and barometric pressure); Irritants (Dust: domestic and industrial), Chemicals, Air pollutants: nitrogen oxides, sulfur dioxide, carbon monoxide, ozone, particulate matter, etc.; Irritants originating from other people: tobacco smoke, perfume, etc.; Psychological and Emotional Factors; Fatigue, Over-Exertion, Over-indulgence; Exercise; Drugs (Aspirin and related compounds).

If it is decided that an allergy is at fault, a search can begin for the specific allergens involved.

A medical history of the patient should be taken to determine if there is a history of allergy in the family. The next step is a physical examination, looking not only for the customary signs of allergic disease but for any other contributing or associated factors.

Complete blood counts and smears of mucous secretions for the detection of eosinophilia will be helpful. A blood eosinophilia above 6% is suggestive of allergy. Early in the course of allergic rhinitis, eosinophilia may be great, but as symptoms and signs continue, the clear mucus may be replaced with thick, cloudy or greenish-yellow secretions, loaded with polymorphonuclear neutrophils as well as bacteria.

If there is doubt about the presence of allergy, levels of IgE antibody to a particular allergen can be determined by a blood test called the radioallergosorbent test (RAST). After the age of one year, IgE levels vary widely, but significant elevations are noted in allergic rhinitis, asthma and atopic dermatitis, in an ascending order of magnitude.

When symptoms of asthma are present, an initial evaluation should always include a Tine Test and a chest X-ray, to rule out the presence of tuberculosis.

Pulmonary function testing should be done to test the patient’s vital capacity and forced expiratory volume (FEV). Reductions of more than 20% from normal would be significant.

**Scratch Testing**

Once the decision has been made that an allergy is the cause of the symptoms, the next logical step is to discover what the specific allergen(s) may be. This normally requires direct skin testing, using the “Scratch test.” The skin is cleansed with alcohol and allowed to dry. Sites used are the forearm or interscapular region of the back. The skin is stretched taut and a sterile “scratch pin” is used to puncture the epidermis. A scratch one to four millimeters long is made. The purpose is to raise the skin, abrading it without drawing blood. [Note: If blood is drawn, the site should NOT be used.] One drop of extract containing the suspected allergen is applied to the scarification, taking care not to touch the skin with the dropper. Positive reaction is indicated if a wheal forms within 15 minutes.

**Intradermal Skin Testing**

When a defect in delayed hypersensitivity (cell-mediated immunity) is thought to be present as a contributing factor, one may use intradermal skin tests for antigens to which the patient may have been exposed that tend to give delayed, tuberculin-type skin-test reactions. A battery of such tests may include Candida albicans, tetanus toxoid, streptokinase-streptodornase, Trichophytin, mumps and purified protein derivative.

**Challenge Testing**

The role of a specific allergen in allergic disease often can be proven by direct challenge. This has been common practice in food allergies, where elimination of one or more suspected foods from the diet for a period of three or four weeks is followed by evaluation of the degree of improvement. If significant, this is followed by reintroduction of the suspected foods into the diet. One food is reintroduced at a time and the patient is observed for recurrence of symptoms.

Several requirements are necessary if challenge testing is used to provide data meaningful for a sound evaluation:

1. There should be total elimination of the food or foods in question.
2. These foods should be eliminated for at least three to four weeks to allow ample time for the suspect substances to be eliminated from the system.
3. If a food is indeed the cause of the allergy, the patient should show significant improvement following its elimination from the diet.
4. Reintroduction of the suspected food should be in such a manner as to preclude its recognition by the patient. This is very difficult in children, especially if very young, but it can be attempted.
5. If a positive response is obtained and symptoms develop again within one to three days after the suspect food has been reintroduced, the experiment should...
be repeated at least once, preferably twice, to eliminate the possibility of coincidence.

With careful explanations and much support, elimination diets can be extremely useful. A patient's failure to improve while on such restricted a diet should be a signal to return to normal food intake, thus avoiding nutritional deficiencies.

In asthma, bronchial challenge has been recommended as a method of obtaining cause-and-effect information on specific inhaled allergens. After establishing a baseline FEV, the patient inhales for a few minutes a measured amount of an aerosolized antigen. Subsequent readings of the FEV at intervals after the challenge will show a drop of at least 20% in the FEV if the test is positive. Similar information may be obtained by using a peak flow meter test. Attacks of asthma, sometimes severe, may follow a positive bronchial challenge and, therefore, this technique is used under carefully controlled situations.

Allergic Rhinitis

Allergic rhinitis may be either seasonal or perennial in nature and is frequently encountered among children and adults. In the northeastern United States, for example, a patient may have seasonal allergy symptoms that occur only in the spring. In such a case, sensitivity to grass or tree pollen (or both) may be the explanation. If symptoms occur in August and September, ragweed pollen is probably the cause. Other parts of the country have particular pollens and grasses, which cause discomfort at specific times of the year. Recurrent episodes of nasal symptoms throughout the spring, summer and fall may indicate mold allergies.

Nasal symptoms may also be caused by sensitivities to animal dander, house dust and foods. The patient may be able to tolerate short exposure to danders or particular foods, but the constant presence of a household pet or the eating of large quantities of a particular food that they are sensitive to may precipitate an allergic response. Cases are also known of patients who are sensitive only to certain foods during specific pollinating seasons (e.g. cantaloupe, tomato or chocolate during the ragweed-pollinating season).

It is rather unusual for an allergic patient to have an allergy to one particular inhalant antigen. A patient may be allergic to any combination of pollens, molds, other inhalants, or foods.

“Hay Fever” is actually a misnomer for ragweed, grass or tree pollen sensitivity. This term continues to be used, however and is recognized as a clinical entity involving the pollens just mentioned. The symptoms usually include itchy, watery eyes. Itching involving the palate, pharynx, face and ears have been seen as associated symptoms. Patients may complain of a dull headache and a sensation of mild throat irritation.

The first episode of allergic rhinitis may occur at any age and is usually associated with a positive family history of allergic disease although rare cases of pollen and house dust sensitivity have been described during the first two years of life. It usually takes at least two years of exposure to a specific pollen before one becomes clinically sensitive.

The patient with active allergic rhinitis may either appear quite well or may present a picture of extreme physical discomfort. Many patients experience severe symptoms upon arising and these subside in the late morning or afternoon. Because of the continuous sneezing and itching, sleep can be disturbed and they may appear exhausted. A patient’s at-tentiveness or efficiency at work or school may subsequently be adversely affected. The diagnosis of allergic rhinitis is confirmed by comparing a clinical history of the patient with specific allergy skin testing.

Patients with allergic rhinitis who are not receiving proper treatment of their conditions, may subsequently develop bronchial asthma, secondary sinus infections, serous otitis and nasal polyps. A patient’s nasal symptoms may occur only during cold weather. This may be caused by one antigen like house dust or a combination of factors such as greater exposure to a household pet or to tobacco smoke. Symptoms during the winter may also result from mold allergies. Molds may be present in the earth of plants within the house and are also found in damp basements.

Common syndromes encountered in the allergic patient are: Seasonal “hay fever,” perennial allergic rhinitis and vasomotor rhinitis. Complaints of prolonged or chronic “head colds” may be due to any of these syndromes. Certain general principles of treatment are applicable to all patients, regardless of diagnostic categories. Oral antihistamines and decongestants are used to control discomfort; Corticosteroids to control disability or to avert impending disability, as distinct from controlling discomforts; and Nasal sprays and nasal drops. The treatment of each of these syndromes will now be considered individually.

Seasonal Allergic Rhinitis

Seasonal allergic rhinitis may be due to tree, grass or weed pollens or to atmospheric mold spores.

Pollen from a wide variety of trees produces symptoms between February and June, according to geographic location. Individual trees pollinate for one
or two weeks. Because many trees pollinate in a given area in a relatively short while, it is difficult to identify the exact tree to which a patient is allergic.

Grass pollens are released into the air from the middle of May to late June or early July. Symptoms from grass pollens are commonly called “hay fever” or “rose fever,” although hay and roses are usually not at fault.

Ragweed pollen is found in the air from mid-August to late September. Symptoms from pollen allergy may continue for a few weeks after the pollen season has concluded.

The molds, Alternaria and Hormodendrum, grow outdoors in vegetation and release spores in an irregular pattern from May to December. Other mold spores may play some role but this has not been clearly established.

For the pollen sensitive patient, an air-conditioned bedroom is a great aid. During the height of the pollen season, prevention and avoidance may be extremely important in minimizing symptoms. Ideally, the whole house should be centrally air conditioned and a filter should be attached to the air conditioning unit. If the use of central air conditioning is not practical, then an attempt should be made to at least have a window or wall air-conditioning unit installed in the patient's bedroom. A patient will spend at least one third of his life in the bedroom. Proper rest can never be obtained if a patient’s sleep is continuously interrupted by allergy symptoms.

Obviously, some activities should be avoided, if possible. Going on picnics to areas with lots of vegetation, visiting farms and rural areas and long car rides with the windows open are all guaranteed to expose the patient to a maximum of pollen in a short time. Since it is probably impractical to avoid these activities altogether (and not much fun either) the patient should be prudent when choosing activities sure to bring him into contact with a lot of pollen. Allergic patients should, if possible, not mow grass, rake leaves or work in the garden.

While indoors, the allergic patient should avoid damp and musty basements. When doing cleaning chores, brooms, dry mops and dry dust cloths should not be used. Instead mops and dust cloths should be dampened. The use of a product like “Endust” which cuts down on the amount of dust that clings to surfaces should be encouraged. Vacuum cleaners also should be avoided, since they throw dust into the air and further aggravate the condition. Feather pillows (which hold dust and are hard to clean) and foam rubber pillows (which may become damp and harbor mold spores) should not be used. Instead, Dacron or some type of polyester-filled pillows should be used and also washed frequently.

If exposure to any of the above aggravating factors cannot be avoided, the use of a dust mask may help minimize symptoms.

In addition to avoiding the sources of allergens, the patient may be treated with immunotherapy (desensitization) injections and symptomatic therapy involving the use of drugs.

Perennial Allergic Rhinitis

Perennial allergic rhinitis may be due to a variety of inhalants or other allergens. House dust mites and animal danders are the most prominent causes. Other allergens include: feathers, indoor molds such as aspergillus and penicillin, clothing and other organic materials like wool, bakery dust, foods and drugs. Ideal therapy in allergy is avoidance of the cause. This should produce prompt relief. Patients should be avoidance teaching and other advice for environmental control where appropriate (See Patient Education section). Foods and drugs that actually cause symptoms must be avoided.

For patients with dust allergy, the most important measure is establishment of an environment that is as dust free as possible. They will spend up to half their lives in their homes, which is the only place where they have any degree of control over their exposure to dust.

It is particularly important that a patient’s bedroom be as dust free as possible, since he or she will spend an average of eight hours a day in this room. Ideally, it should contain only a bed, a wooden chair and a chest of drawers. Closet doors should be kept closed at all times, as should the drawers. There should be no carpeting, other than perhaps some small throw rugs that can be washed easily and frequently. Mini blinds should never be used; a pull-down shade collects less dust. If curtains are used at all, they should be of the kind that can be taken down and washed often. The mattress and box springs should be encased in a zippered vinyl cover. Dust mites live primarily in mattresses and box springs and this fact makes the dust from them more allergenic than any other dust in the house. Fitted mattress covers are not satisfactory, as dust will merely puff out at the bottom. Dust mites also live in fiber pillows, so these should be washed regularly. Feather pillows and foam pillows should not be used at all. Blankets and all bedding should be washed weekly in hot water (130 degree F) and dried in a hot dryer, again to control dust mites. Bedspreads that can be easily washed and dried are best. Knickknacks, bottles, jars – anything that easily collects...
dust should not be left out on the tops of tables, etc. Ideally, there should be no furniture in the house that has cloth upholstery. Instead, vinyl, which is easily washed, provides better dust control.

Many people think animal allergies are caused by the fur or feathers of their pet. But researchers have found the major allergens are proteins secreted by oil glands in the animals’ skin and shed in dander as well as proteins in the saliva, which sticks to the fur when the animal licks itself. Urine is also a source of allergy-causing proteins. When the substance carrying the protein dries, the proteins then float into the air.

Allergies to animals can take two years or more to develop and may not subside until six months or more after ending contact with the animal. Carpet and furniture are reservoirs and allergens can remain in them for four to six weeks. In addition, they can stay in the air for months after the animal has been removed. Before taking a pet away from a patient is suggested, evaluate the patient’s emotional attachment to the animal. It may be more harmful to the patient to give up a cherished pet than to live with the allergy symptoms.

**Symptomatic Treatment for Seasonal and Perennial Allergic Rhinitis**

For people who cannot adequately avoid allergens, the symptoms can often be controlled with medications, including antihistamines, decongestants and nasal steroids of which many are available over-the-counter or by prescription.

**Antihistamines** compete with histamine for the cellular receptor site but do not combine with histamine within the body. There are hundreds of commercially available antihistamines and individual patients do not respond to all classes of antihistamines to the same degree. If the initial drug chosen does not give a good therapeutic response, the physician usually proceeds to another group. At times, it is necessary, by trial and error, to try one group after another in various combinations with sympathomimetic agents (decongestants) to obtain a reasonable therapeutic result.

The patient who has most nasal symptoms within two hours after awakening would benefit from a short-acting antihistamine. The patient who has symptoms throughout the day would benefit from a long-acting antihistamine, given in divided doses, throughout the day or in a sustained release form.

The older class of antihistamines, such as diphenhydramine (Benadryl), brompheniramine maleate (Dimetane) and Clemastine fumarate (Tavist) are H1-receptor antagonists, which work by blocking histamine. These have side effects in many body systems, but are notorious for the drowsiness they induce. They can be dangerous if used when driving or times when it is important to be awake and alert.

The newer generations of antihistamines are non-sedating and have fewer side effects. They require a prescription and are generally higher in cost, but have proven to be extremely effective and have fewer side effects. They act by binding to peripheral histamine receptors. Examples of this group include fexofenadine HCl (Allegra), loratadine (Claritin) and cetirizine HCl (Zyrtec) which is also available in syrup form approved for children as young as two years old.

(Nov 2007) /The Food and Drug Administration (FDA) has approved Zyrtec-D (cetirizine HCl 5 mg and pseudoephedrine HCl 120 mg), an allergy drug, for nonprescription use in adults and children 12 years of age and older. This drug combines an antihistamine with a nasal decongestant.

Available as a prescription drug since 2001, Zyrtec-D is now approved as a nonprescription drug for the relief of symptoms due to hay fever or other upper respiratory allergies such as, runny nose, sneezing, itching, watery eyes, itching of the nose or throat, and nasal congestion. Zyrtec-D is also for reducing swelling of nasal passages, for relief of sinus congestion and pressure, and for restoring freer breathing through the nose. This approval reflects FDA’s commitment to bringing prescription drugs to the over-the-counter market when they can be safely used without a prescription.

**Decongestants**, sympathomimetic agents which usually act as stimulants, are often used in combination with antihistamines for a combined therapeutic effect. The antihistamine helps to relieve the itchy, watery eyes, nasal discharge, sneezing and itching of the nose, throat and ears, but not post-nasal drainage and stuffy nose. However, the post-nasal drainage and stuffy nose respond quite well to decongestants. In addition, the stimulatory effect that decongestants often have may serve to offset the drowsiness that is a common side effect of the antihistamines.

It would be impossible to list all the commercially available antihistamines, decongestants, or combinations of these within this course. However, the following generalizations will assist you with client teaching and give you a solid knowledge base.

**Side Effects**

CNS: Sedation ranging from mild drowsiness to deep sleep. Dizziness, incoordination, faintness, fatigue, confusion, restlessness, nervousness, tremor, tonic-clonic seizures, headache, irritability, insomnia, euphoria, paresthesias, disorientation, tongue pro-
trusion (usually with IV use or overdosage), disturbing dreams, nightmares, weakness, diplopia, vertigo, neuritis, paradoxical excitation. Extrapyramidal reactions.

**CV:** Postural hypotension, palpitations, bradycardia, tachycardia, reflex tachycardia, extra-systoles, increased or decreased BP, ECG changes (including blunting of T waves and prolongation of the Q-T interval), cardiac arrest.

**GI:** Epigastric distress, anorexia, increased appetite and weight gain, N&V, diarrhea, constipation, change in bowel habits, stomatitis.

**GU:** Urinary frequency, dysuria, urinary retention, gynecomastia, inhibition of ejaculation, decreased libido, impotence, early menses, induction of lactation.

**Respiratory:** Thickening of bronchial secretions, wheezing, nasal stuffiness, chest tightness, sore throat, respiratory depression, dry mouth, nose and throat.

**Topical use:** Prolonged use may result in local irritation and allergic contact dermatitis.

**Symptoms of Acute Toxicity:** Although antihistamines have a wide therapeutic range, overdosage can nevertheless be fatal. Children are particularly susceptible. Early toxic effects may be seen within 30-120 min and include drowsiness, dizziness, blurred vision, tinnitus, ataxia and hypotension. Symptoms range from CNS depression (sedation, coma, decreased mental alertness) to CV collapse and CNS stimulation (insomnia, hallucinations, tremors or seizures). Also, profound hypotension, respiratory depression, coma and death may occur. Anticholinergic effects include flushing, dry mouth, hypotension, fever, hyperthermia (especially in children) and fixed, dilated pupils.

### Laboratory Test Interference
Discontinue antihistamines 4 days before skin testing to avoid false result.

### Dosage
Usually PO. Parenteral administration is seldom used because of irritating nature of drugs. Topical usage is also limited because antihistamines often cause hypersensitivity reactions. When given for motion sickness antihistamines are usually given 30-60 min. before anticipated travel. See individual drugs.

### Nursing Considerations
Topical preparations should not be applied to raw, blistered, or oozing areas of the skin. Do not apply to the eyes, around the genitalia or to mucous membranes. PO preparations may cause gastric irritation. Therefore, administer the medication with meals, milk or a snack.

### Assessment
1. Note any history of drug sensitivity to antihistamines and document known allergens.
2. Note if the client has any medical history of ulcers or glaucoma or if the client is pregnant. Many antihistamines are contraindicated under these circumstances.
3. Document indications for therapy and the onset of symptoms. Assess the extent of the allergic response for which the antihistamine is being ordered.
4. Review the medications the client is currently taking, noting those which may interact unfavorably.
5. Determine if the client is to have skin testing conducted. Antihistamines generally should be discontinued 4 days prior to testing to avoid false negative results.
6. Monitor VS; document if the client develops hypotension or palpitations.
7. Assess lung sounds and note characteristics of secretions produced.
8. Assess skin condition. Note extent and describe any rash, if present.

### Interventions
1. Note client complaints of severe CNS depression. This is a symptom of overdose and may require the administration of syrup of ipecac.
2. Monitor I&O and ensure adequate hydration. If clients experience difficulty in voiding have them void prior to receiving the medication.
3. If the client complains of constipation, encourage at least 2L/day of fluids unless restriction of fluids is necessary. Instruct client to increase the amount of exercise performed (if condition permits) and to consume more fruits, fruit juices and dietary fiber. A stool softener may also be indicated if these measures are not successful.
4. If bronchial secretions are thick, increase fluid intake to decrease the viscosity of secretions and advise to avoid milk temporarily.
5. If the client is hospitalized and sedated with antihistamines, supervise ambulation and activities and incorporate safety precautions.
6. If the client complains of dizziness, weakness or lassitude, assist with ambulation and report these symptoms.
7. If clients complain of local irritation, they may have developed an adverse reaction to the drug that
should be reported.

8. Recurrent reactions of a chronic nature should be referred to an allergist. Clients should be taught how to protect themselves from undue allergen exposure and how to create an allergen-free living area.

**Nasal Sprays**, although popular and used to reduce swelling of nasal passages, can have a rebound effect leading to swelling if used for more than a few days. This can also cause some people to become dependent on their use.

**Corticosteroid nasal sprays** are prescription anti-inflammatory drugs that stop the allergic reaction. These sprays reduce the number of mast cells in the nose, reduce mucus secretion and nasal swelling and shrink inflamed tissues. They act topically in the nose, thereby avoiding systemic affects of the steroids. Examples include fluticasone propionate (Flonase), beclomethasone dipropionate (Beconase, Vancenase) and triamcinolone acetonide (Nasacort).

**Cromolyn Sodium** is the only drug available by prescription and over-the-counter that can actually prevent allergic reactions from starting. It safely inhibits the degranulation of mast cells and stops the release of histamines and SRS-A. Unlike other respiratory drugs, there are no adverse interactions with other drugs, no affects on diagnostic tests and no contraindications for the elderly.

**Eye drops** – What about itchy allergy eyes? Ocular symptoms such as itching and tearing can be very troublesome. Often a cold washcloth applied to the eyes will provide topical anesthesia and vasoconstriction. But if that is not enough...

There’s a prescription eye-drop available for the millions of Americans who suffer from “allergic conjunctivitis,” it’s called Optivar (azelastine hydrochloride ophthalmic solution). The FDA approved the drug, manufactured by ASTA Medica, Optivar Optivar is an antihistamine that works quickly (within 3 minutes) and prevents itching for up to eight hours. The recommended dosage is 1 drop in each affected eye twice daily. Clinical trials have established the effectiveness in both adults and children (age 4-12). The most common side effects reported by patients were temporary eye burning/stinging, headache and bitter taste, all of which were generally mild.

A newer class of prescription drugs joining the anti-allergy arsenal. Known as Anti-IgE, it just may revolutionize not only the way seasonal allergies are treated, but also the treatment of asthma as well as food and drug sensitivities.

“It is the first phase of a new kind of treatment for allergy disease – and it holds some very exciting promise,” says Dr. Lanny Rosenwasser, president of the American Academy of Allergy, Asthma and Immunology and a researcher and allergist at the National Jewish Medical and Research Center in Denver.

The new anti-IgE treatments take an entirely different approach from current allergy treatment. They work to help prevent the body from reacting to an allergen in the first place.

“An anti-IgE binds to IgE and ties it up, preventing it from activating and inflaming the mast cells,” The body is “tricked” into believing there is no allergen present. So, it responds as if there were no allergy. More importantly, anti-IgEs are not “allergen-specific.” Theoretically, they can work to block almost any type of allergic reaction. “It has promise in all allergic diseases,” says Rosenwasser, “including drug and food allergies.”

The good news is that the first anti-IgE medication – a drug known as Xolair (omalizumab), manufactured by Genetech – was approved by the FDA. The discouraging news is that it must be administered once or twice a month by injection, which is expected to be costly. It was tested primarily in asthma patients, so it’s true effectiveness with seasonal allergies has not yet been fully determined.

Besides Xolair, other IgE drugs are in development to help treat various types of allergies. Earlier studies published in The New England Journal of Medicine showed how one anti-IgE medication reduced the life-threatening affects of a peanut allergy.

Research colleagues at the National Jewish Medical and Research Center are also developing another allergy treatment called Anti CD23. It works by thwarting the connection between allergens and the immune system at an even earlier stage than the anti-IgE drugs, and similarly disrupting the sequence of allergic responses. This treatment could be available within several years.

**Medication Education**

1. Explain that the medication should be taken before or at the onset of symptoms as antihistamines cannot reverse reactions but they may prevent them.

2. Review the appropriate steps to follow during an acute allergic reaction and how to differentiate, such as with a bee sting and ensure the client has epinephrine available for self-administration.

3. Report all adverse effects immediately. Include onset of side effects and duration, describing exactly what occurred. Another drug with fewer side effects may be indicated. The client should not discontinue
taking the medication without first consulting the provider.
4. Provide a printed list of drugs to avoid. Advise the client to consult with the provider concerning any depressants that may be ordered since antihistamines tend to potentiate the effects of other CNS depressants.
5. Caution the client not to drive a car or operate other machinery until response to the medication (drowsiness) has worn off. Sedative effect may disappear spontaneously after several days of therapy.
6. If daytime sedation is a problem there are non-drowsy antihistamines available.
7. Report the development of sore throat, fever, unexplained bruising, bleeding or petechiae. Laboratory studies (CBC and platelets) may be indicated to rule out a bleeding or petechiae. Unexplained bruising, of sore throat, fever, and platelets) may be indicated to rule out a hematologic abnormality.
8. Advise the potential for developing sensitivity to sun or ultraviolet light. Avoid any undue exposure to the sun, use a sunscreen and wear a hat, sunglasses and protective clothing when in the sun.
9. If the drug is being used for motion sickness, it should be taken 30 minutes before it is time to use a vehicle or board a plane.
10. Avoid alcohol and any OTC products unless prescribed.
11. Advise that symptoms of dry mouth may be reduced by frequent rinsing with water, good oral hygiene and the use of sugarless gum or candies.
12. Explain that these products raise BP and should only be used for hypertensive clients under strict medical supervision.
13. Encourage family/significant other to learn CPR and explain that survival is greatly increased when CPR is initiated immediately.

**Evaluate**
- Reports of decreased frequency and intensity of allergic manifestations;
- Control of severe itching and associated swelling;
- Prevention of motion sickness;
- Effective night time sedation.

**Vasomotor Rhinitis**

This is a chronic rhinitis condition and nasal obstruction without allergy or infection, characterized by sneezing, rhinorrhea and vascular engorgement of the mucous membranes of the nose. A vaporizer or humidifier and systemic vasoconstrictive agents are used to alleviate discomfort. Nose drops and sprays are avoided because continued use may cause further vasoconstriction of the mucous membrane and aggravation of the condition. This condition is common in pregnancy.

Most patients with vasomotor rhinitis are adversely affected by cold air, drafts and temperature changes. Not only is the respiratory mucosa directly affected by these conditions, but a reflex action is involved too, when any part of the skin is chilled. The patient must wear proper clothing to allow for adjustment to temperature changes and must avoid drafts and cold air.

Any smoke is an irritant, whether from tobacco, burning leaves or rubbish. The patient must not smoke and must try to avoid situations where he is likely to come into contact with people who are smoking. It is almost impossible to escape the fumes from manufacturing; however, the patient can minimize contact with insects, paint, hair sprays, fumes and dusts from hobbies and recreational activities. The patient who suffers from itchy eyes and a stuffed up nose after being exposed to exhaust fumes from cars or after breathing in the polluted air of many of our major cities may not be allergic but rather hypersensitive to the substances in the air.

Sleeping with the head elevated can help relieve congestion, which often seems to be worse at night.

**Allergic Dermatosis**

Dermatologic problems are frequent. It is important to differentiate between atopic dermatitis (eczema) and allergic contact dermatitis. Atopic dermatitis is better called hypersensitivity dermatitis rather than allergic dermatitis. There is no true allergen-antibody reaction that takes place in this disease. In many cases the cause of the dermatitis is not known.

In contrast, allergic contact dermatitis is a cell-mediated, delayed hypersensitivity reaction to an antigenic substance applied to the skin. Keep in mind that this differs from simple chemical or physical irritation of the skin. A true allergen-antibody reaction takes place.

**Atopic Dermatitis (Eczema)**

This is an intensely pruritic, often excoriated, maculopapular inflammation commonly found on the face and antecubital and popliteal areas of allergy-prone (atopic) individuals. In infancy and early childhood it is called infantile eczema and is characterized by erythema, oozing and crusting. In adults the disease manifests itself with crusting and excoriation. Eczema usually be-
gins early in life and is associated with a positive family history for atopic. The patient with eczema is especially sensitive to irritation, infection, heat and scratching. The pruritus (itching) that is associated with the atopic eczema causes the patient to scratch, thereby further stimulating and irritating the skin and sometimes leading to secondary infections.

It has been shown that patients with atopic dermatitis have elevated serum IgE levels; but there is little correlation between the serum levels of IgE and the severity of the disease. It has been theorized that a specific IgE antibody reacting with an allergen will cause a release of histamine from the basophils or mast cell, thus producing the pruritus and scratching that is seen as part of the symptoms. Another theory points to a defect in the regulatory T lymphocyte or a lack of T-cell suppressor lymphocyte in these patients.

Because of the sensitivity of the patient’s skin, climate, changes in temperature, fatigue, sweating, emotional trauma and contact with irritants are all aggravating factors.

It is important for the patient to know that the condition is chronic and that good treatment will control the disease, not cure it. A patient with atopic dermatitis can go on to develop hay fever or asthma at a later stage in life.

The purposes of treatment are the relief of symptoms, elimination of secondary infection if present and to allow the affected individual to function reasonably well.

A generalized treatment scheme includes identification and avoidance of allergens and administration of topical and parenteral corticosteroids, tar ointments, antihistamines and wet compresses of Burow’s solution. Avoid wool, silk and regular soaps since all of these can be irritating; keep cool and comfortable, avoid heat and humidity; satin or percale sheets are the least irritating to the skin; bandage the skin if necessary; fingernails should be kept short.

To control a secondary infection use Betadine skin cleanser (1:1 with water), then apply local antibiotic cream. If ineffective, the use of oral antibiotics may be necessary for 10-14 days.

Although food intolerance is uncommon, the dramatic effect of an elimination diet after a three to four week trial in a young infant is remarkable. (Cow’s milk, chocolate, nuts, wheat, eggs, legumes, fuzzy and citrus fruits, raw tomatoes).

For persistent eczema in older children and adults, the possibility of inhalant allergens playing a role in aggravating the situation has to be considered.

### Allergic Contact Dermatitis

Allergic contact dermatitis is a cell-mediated, delayed hypersensitivity reaction to an antigenic substance applied to the skin. The characteristic clinical feature of allergic contact dermatitis is an irregular and asymmetric distribution of linear lesions not conforming to dermatomal cleavage lines and nerve distributions. Angular, irregular and bizarrely shaped patches with asymmetric appearances on one arm or one leg or a portion of the trunk will distinguish contact dermatitis from other allergic dermatoses. The most common causes are irritants—i.e., nickel, plastic, latex, poison ivy and other members of the “Rhus” family, shoe or sock contact, clothing, cosmetics and diaper dermatitis.

Good clues to the cause of contact dermatitis usually can be obtained by taking a careful history, particularly for prior contact with similar clothing, plants or cosmetics and noting the distribution and configuration of the lesions.

Frequently, contact dermatitis lesions turn up on the patient’s hands. It is often impossible to distinguish between irritant and allergic contact dermatitis of the hands without performing patch tests. It is also quite possible that the eating or drinking of any chemical, which gives a positive patch test, can produce an eruption on the palms.

Nursing and other health care personnel often are allergic to the following: iodine, alcohol, streptomycin, penicillin, chlorpromazine, benzalkonium chloride, eugenol, clove oil and cinnamon oil. Gloves may protect the hands of medical personnel with contact allergies, but sometimes there is also an allergy to chemicals in the gloves as well. In such a case, “hypoallergenic” gloves can be worn. Latex hypersensitivity has become an increasingly prevalent “occupational hazard.” It is a problem that was not even recognized prior to 1979.

**Rhus Dermatitis** (poison ivy, poison oak, poison sumac) accounts for the more common eruptions found in patients. The lesions are usually on the exposed areas of the face, arms and legs. The antigen may also be transmitted to the genitalia or eyes by the fingers. In those previously sensitized, the rash begins to appear within one to three days after contact. The intensity of the eruption usually increases over the next seven days and then it remits spontaneously. The rash occurs in vesicular and occasionally bullous, erythematous streaks and patches and the itching is intense.

Management is best achieved by educating the patient to avoid future contacts with the substances causing the problem. When contact has occurred, immediate washing of the area is effective. Once the eruption has occurred, Benadryl is helpful and
tap water, saline, or 1:20 Burow’s solution soaks can be soothing. Applications of hydrocortisone cream (0.5-1%) will be useful; in milder cases, plain calamine lotion can be effective. Topical applications of antihistamines or benzocaine should never be used because these substances can cause a secondary allergic reaction of their own.

In several recurrent cases when the eruption is acute, exudative and vesicular or bullous, oral corticosteroids may be necessary.

Cosmetic Dermatitis is usually caused by hair dyes, perfumes, sunscreen preparations, lipsticks and antiperspirants. Although a patient may use a substance for many years without experiencing skin eruption, an allergic reaction can result from recent sensitization.

The appearance of allergic contact dermatitis due to cosmetics varies. The location may be in the area to which the cosmetic is applied, for example, lipstick dermatitis would appear as an inflammation of the lips or the area of involvement may be remote from the site on which the sensitizer is placed. An illustration of this is the allergy to nail polish that shows up as an inflammation of the eyelids, presumably due to the patient rubbing the eye area with the fingertips. Keep in mind, that not only cosmetics, but also tools used with cosmetics, such as powder puffs, eyelash curlers, rollers, bobby pins, etc., may be the culprits rather than the cosmetic itself.

The most frequent cause of cosmetic allergic contact dermatitis is paraphenylenediamine. This is contained in hair dyes and the characteristic eruption appears first on the tips of the ears. The frequency of allergic reactions is so high that manufacturers enclose instructions for patch testing and explain that this should be done before attempting use of the dyes. Dermatitis from hair sprays may also manifest itself initially on the rims of the ears. Later, the eyelids, face and neck may become involved. Shampoos, hair straighteners, bleaches, etc., may cause dermatitis and usually first appears on the eyelids, along the forehead or neck regions or sometimes on the fingertips.

Formaldehyde may be present in antiperspirants and can occasionally cause contact dermatitis. Neomycin has been incorporated into many preparations and is a frequent sensitizer. Deodorant soaps, which include tribromo-salicylanilide or tetrachlorosalicylanilide, may cause true allergic contact dermatitis.

Dermatitis from creams, powders and blush, as well as other material applied to the face area, is most often caused by perfumes used in the products although some irritant dermatitis may develop secondary to the alkaline nature of the materials. After-shave lotions and shaving creams containing lime often cause contact dermatitis behind the ears.

The management of a patient with dermatitis due to cosmetic use requires a proper diagnosis and then the elimination of the agents causing the allergic reaction. The cosmetic responsible for the dermatitis may be a relatively new one or it may be one that has been used for many years.

In the acute stages of the eruption there are many substances such as a 1:20 Burow’s solution compress which may be used to soothe the areas involved and to remove crusts. Application of local steroid creams is generally beneficial and these should be applied to wet skin for best results.

Clothing Dermatitis is often due to formaldehyde impregnated in cloth to prevent wrinkling. The lesions usually will be found over the trunk and buttocks, where the clothing binds closely to the body. The axillary folds may be severely affected because formaldehyde leaches onto the skin with perspiration.

Substitution of polyester, nylon or acetate clothing may avoid further irritation. Clothing dermatitis may be due to substances other than formaldehyde, but the cloth itself is rarely the cause of the allergic reaction. Among the other substances that render clothing “allergenic” are dyes, agents used to finish fabrics and sizing.

For those patients who exhibit an allergy to the formaldehyde in permanent press clothing the most obvious treatment is to avoid wearing permanent press clothing. However, if the sensitivity is not particularly severe, it may be possible for the patient to wear clothing that is permanent pressed provided it has been washed and rinsed several times before the first wearing. Washing and rinsing removes a considerable amount of formaldehyde.

If the allergy is severe, you must avoid not only clothing which is permanent press but also sheets, contact with permanent pressed clothing. Topical steroid preparations, in aerosol form, are of benefit here for a number of reasons. The aerosol medication penetrates well and a protective film of isopropyl myristate is left to protect against dyes and finishes. This type of administration also has the advantage of keeping the patient’s hands off the dermatitis thus preventing secondary infection.

The incidence of dermatitis from any particular dye is greatly enhanced if the dye can be easily leached out of the material. That is, if the dye “bleeds.” Perspiration may play a key role in the production of the dermatitis and the eruption would occur predominantly in the areas of increased friction and perspiration.

Treatment, once the diagnosis
is established by patch testing, consists of local wet dressings; application of topical steroid preparations; avoidance of darkly-dyed clothing; and possibly tranquilizers or anticholinergics to reduce perspiration. In severe reactions, systemic corticosteroid therapy may be necessary.

It must be remembered that dermatitis may be due to substances that have been retained in clothing after it has been purchased, washed and worn. Detergent remaining in elastic bands of underwear, in tight collars and in cuffs, may be a possible source of dermatitis. Cleaning fluids that remain after clothes have been dry cleaned may also cause an allergic or irritant type of dermatitis. Accessories on clothing may cause dermatitis. For example, zippers, clips, buckles and various pins may produce dermatitis in nickel-sensitive individuals.

General measures for the management of clothing dermatitis consists of thorough washing and rinsing to remove as much detergent from the material as possible; airing of clothes, which have been dry cleaned before wearing; control of perspiration; and wearing of sleeveless dresses by women who are allergic to formalin (formaldehyde) and develop dermatitis in the axillary areas. Occasionally, protective garments may be used, rather than disposing of the irritating clothing. For example, women may wear nylon slips with sleeves to protect hypersensitive skin from irritation from rough woolen dresses, etc. Although wool does not cause an allergic contact dermatitis, it frequently causes an irritant dermatitis, due to the nature of the wool fiber. Women may have to avoid wearing girdles, as they may produce a situation where perspiration accumulates on the covered skin and cannot be eliminated by the normal evaporation process. This may cause mechanical irritation, as well as be a setup for severe contact dermatitis.

Cool wet dressings, protective sprays and a combination of the two, are the usual treatments for clothing dermatitis.

**Metal Dermatitis:** Certain metals are likely to sensitize the skin and cause dermatitis when in direct contact with the skin. Usually, the inhalation or eating of minute quantities of these metals does not cause dermatitis.

Whether or not a metal will be sensitizing depends mostly on whether the metal is soluble. For instance, elemental nickel and chromium are not expected to produce dermatitis, but some of their salts are strong sensitizers. The salts are soluble in water, including perspiration.

Since most metals occur in nature and are employed as alloys with other elements, their effects upon the skin are highly variable. Sometimes a synergistic effect occurs in which two or more elements in an alloy induce much greater irritation than each element alone. In other instances, the individual metals contained in an alloy antagonize each other with regard to their sensitizing ability.

The two metals responsible for the most contact dermatitis are nickel and chromium. Sources where nickel is likely to be encountered include coins, car steering wheels, nickel-plated jewelry, kitchen and medical instruments, and nickel-plated items handled by cashiers, sales clerks, nurses, dental assistants, etc. In women, lesions are usually observed on the ear lobes, the wristwatch area and the sections of the neck and arms that are in contact with necklaces and bracelets, and the sites where zippers touch the skin. There is often cross-sensitization among chromium, nickel and cobalt, with which nickel is alloyed. Nickel is customarily used as an alloy with silver and gold in jewelry and eyeglass frames. “White gold” is actually an alloy of gold and nickel.

Because cobalt induces cross-sensitivity with both nickel and chromium, it is often a cause of dermatitis when tests for nickel sensitivity are negative. Cobalt is also used in various varnishes, paints and crayons.

Chromium or chromium salt sensitivity occurs in workers in woolen mills, automobile plants, garages, aircraft plants, locomotive shops, air-conditioning equipment shops and photographic and lithographic industries which use chromates. Cement contains up to 0.35% chromium. Chromium compounds are very soluble in water and body fluids. Lead (in paint), brass and zirconium (in deodorants) have also been implicated in metal dermatitis.

The easiest way to relieve metal dermatitis is to prevent the body from coming in contact with the offending metal(s). Placing tape around metal clothing clasps, replacing metal watchbands with nonmetal ones and lining the inside of shoes with plastic wrap to avoid contact with chromium salts in leather are good measures. Gloves can be worn while driving.

Moist or weepy lesions should be treated with compresses soaked in Burow's solution. For dry, chronic lesions, creams or ointments are better. Cortisone ointments (1/2% to 1%) are most frequently used. If a secondary infection has set in, oral antibiotics may be given.

**Food Allergies**

**Life Is No Picnic For Food Allergy Sufferers**

Each year, millions of Americans have allergic reactions to food. Sometimes there is a delay between eating the offending food and experiencing the allergic reaction, which can make things hard to pin down. Allergic reactions...
to food can cause a wide array of symptoms that will be discussed later. They can also contribute to chronic health problems, such as asthma. Other people have persistent yeast infections, which often make them prone to food allergies. Food allergies can affect any part of the GI tract, causing absorption of essential nutrients to be a problem.

Several factors predispose the immune system to react abnormally to food. One of these is known as leaky gut syndrome. This is a disorder where the lining of the intestine becomes unusually porous, allowing relatively large food particles to enter the bloodstream, where they provoke allergic reactions.

Some scientists believe that high levels of stress hormones reduce the body’s ability to keep large food particles in the intestine. Another possible factor in food allergy is an overabundance of the potentially tissue-destructive immune cells, known as T-helper cells without enough T-suppressor cells to keep them in proper balance. Other factors that contribute are heredity and stress.

Food allergy or intolerance? It’s important to know the difference. With food intolerance, you may be able to eat small amounts of problem foods without a reaction. With an allergy, the immune system mistakenly identifies food as harmful. Signs and symptoms usually develop within minutes.

Food intolerance, where a symptom is triggered by a food or substance, is much more common than food allergy. Food intolerance doesn’t involve the immune system but can cause some of the same gastrointestinal symptoms as food allergy. For example, lactose intolerance, where people don’t have the digestive enzymes to fully digest sugar in milk products, can cause bloating, cramping or diarrhea.

Food allergy accounts for about 35-50 percent of emergency room visits for anaphylaxis and causes about 30,000 episodes of anaphylaxis and 100 - 200 deaths per year in the United States. Even with diligent avoidance of known food allergens, each year approximately one of every four food allergic individuals will have an accidental exposure that leads to a food-induced reaction.

Severe, life-threatening reactions occur mostly in adolescents and young adults, and peanuts and tree nuts are the most common causes of such reactions. Currently, the only treatments for food allergy are allergen avoidance and management of reactions caused by allergen exposure. In addition to the psychological effects of the risk of death and the stigma of avoiding common foods, food allergy has nutritional impacts on the health, development, and lifestyle of children.

Hence, food allergy has emerged as an important public health problem based on its increasing prevalence, persistence throughout life for those who are sensitized to the foods most likely to cause severe reactions (peanut and tree nut), the potential for fatal reactions, and lack of preventive treatment other than food avoidance.

**Allergies in a Nutshell**

Estimates of the prevalence of food allergies range from approximately 6% to 8% of children and 4% of adults. Though reasons for this are poorly understood, the prevalence of food allergies and associated anaphylaxis appears to be on the rise.

Risk factors associated with food allergy include: family history of asthma and allergies, genetic predisposition to allergic disease, elevated allergen-specific serum immunoglobulin levels (IgE concentrations), and being younger than 3 years of age.

Food allergy is frequently accompanied by other allergic diseases including atopic dermatitis (eczema) and asthma, and asthma is an important risk factor for severe allergic reactions to food. Patients with food allergy may have mild reactions, such as hives, but are also at risk for anaphylaxis, a severe and life-threatening systemic allergic reaction characterized by hives, fall of blood pressure, upper airway obstruction, and severe wheezing.

**What Are Major Food Allergens?**

While more than 160 foods can cause allergic reactions in people with food allergies, there are eight foods that account for 90% of all food-allergy reactions including cow’s milk, egg, peanut, tree nuts (for example, walnuts, pecans, almonds, and cashews), fish, shellfish, soybeans, and wheat and are the food sources from which many other ingredients are derived.

*The eight foods identified by the law are:*

1. **Milk**
2. **Eggs**
3. **Fish** (e.g., bass, flounder, cod)
4. **Crustacean shellfish** (e.g. crab, lobster, shrimp)
5. **Tree nuts** (e.g., almonds, walnuts, pecans)
6. **Peanuts**
7. **Wheat** (gluten)
8. **Soybeans**

**Symptoms of Food Allergy**

Symptoms of food allergies, which can be can be sudden and severe, typically appear from within a few minutes to two hours after a person has eaten the food to which he or she is allergic.

**Allergic reactions can include:**

- Hives
- Coughing or wheezing
- Dizziness and/or lightheadedness
• Swelling of the throat and vocal cords
• Difficulty breathing
• Loss of consciousness
• Flushed skin or rash
• Tingling or itchy sensation in the mouth
• Face, tongue, or lip swelling
• Vomiting and/or diarrhea
• Abdominal cramps
• Eczema or rash

What to Do If Symptoms Occur
The appearance of symptoms after eating food may be a sign of a food allergy. The food(s) that caused these symptoms should be avoided, and the affected person, should contact a doctor or health care provider for appropriate testing and evaluation.
• Persons found to have a food allergy should learn to read labels and avoid the offending foods. They should also learn, in case of accidental ingestion, to recognize the early symptoms of an allergic reaction, and be properly educated on — and armed with — appropriate treatment measures.
• Persons with a known food allergy who begin experiencing symptoms while, or after, eating a food should initiate treatment immediately, and go to a nearby emergency room if symptoms progress.

Treatment of Food Allergies
Some types of mild food allergies are treatable with an antihistamine or bronchodilator. Severe, or anaphylactic reactions, require epinephrine. At present, there is no cure for food allergies. The best method for managing food allergies is prevention by way of strict avoidance of any food that triggers a reaction.

In theory, avoidance sounds simple. In practice, however, it’s maddeningly difficult. In addition to avoidance strategies, alternative practitioners use various modified diets and other techniques. Natural remedies for balancing the immune system includes vitamins, minerals, and nutrients including:
• Vitamin C: 2,000 mg
• Quercetin: 500-3,000 mg
• Tocopherol (Vit. E): 200-400 IU
• Selenium: 200 micrograms
• Zinc: 20-40 mg
• Grape Seed Extract: 50-150 mg
• EPA (eicosapentaenoic acid from fish oil): 500-3,000 mg
• GLA (gamma-linolenic acid, from borage oil): 300 mg
• Calendula tincture: 5 drops in ¼ C of water, 3X/day—prevents over growth of yeast, promotes digestion
• Chamomile tea: 1 C, 3X/day—soothes stomach irritation
• Ginger tea—settles the stomach
• Agrimony tea: 1 C, 3X/day—(Use for NO more than 2 weeks at a time) Helps to heal damaged mucous membranes and soothe bowel irritation
• Stinging Nettle: Capsules, as directed on label. May halt allergic reaction.

Improved Labeling
To help Americans avoid the health risks posed by food allergens, Congress passed the Food Allergen Labeling and Consumer Protection Act of 2004. (www.cfsan.fda.gov/dms/alrgact.html) The law applies to all foods regulated by FDA, both domestic and imported, that were labeled on or after January 1, 2006. (FDA regulates all foods except meat, poultry, and certain egg products.)
• Before this law, the labels of foods made from two or more ingredients were required to list all ingredients by their common, or usual, names. The names of some ingredients, however, do not clearly identify their source.
• Now, the labels must clearly identify the source of all ingredients that are — or are derived from — the eight most common food allergens.

As a result, food labels will help allergic consumers to identify offending foods or ingredients so they can more easily avoid them.

Overview of Food Allergic Reactions
Food allergy is defined as an immune-mediated adverse reaction to food. In allergic individuals, certain foods trigger the immune
system to produce a characteristic class of antibodies against the allergen, called immunoglobulin E (IgE).

IgE binds to receptors that are present on the surfaces of two types of cells—mast cells, which are present in the tissues; and basophils, which circulate in the blood. When an individual who has been sensitized to a particular allergen is re-exposed to that allergen, the allergen binds to IgE on these cells, triggering them to release potent mediators of allergic inflammation including histamine, leukotrienes, and protein messengers known as cytokines. These mediators stimulate the accumulation of eosinophils, a type of white blood cell that is characteristic of allergic inflammation. The mediators are also responsible for the appearance of allergic symptoms. For example, histamine triggers leakage of fluid from small blood vessels into the tissues, and it causes smooth muscle to contract. In mild allergic reactions, leakage of small amounts of fluid into the skin contributes to hives, or urticaria. In severe allergic reactions, leakage of larger volumes of fluid from the circulatory system can cause the blood pressure to drop. Contraction of smooth muscles in the larynx and trachea cuts off airflow. Contraction of smooth muscles in the lung contributes to bronchoconstriction and wheezing, signs of severe asthma. Antihistamines block the effects of low and moderate concentrations of histamine and can be effective in treating mild allergic reactions, especially hives. Because severe allergic reactions generate high concentrations of histamine and other mediators that are not blocked by antihistamines, antihistamines are far less effective in severe reactions. The most effective therapy for severe allergic reactions is epinephrine, which reverses the effects of histamine and other mediators on blood vessels and smooth muscle, and also blocks the continued release of mediators from mast cells and basophils.

Diagnosis

The diagnosis of food allergy is primarily based on the clinical history. Confirmatory information can be obtained by blood tests or skin prick tests that detect allergic (IgE) antibodies to food allergens. The most definitive diagnostic test is a double-blind, placebo-controlled food challenge (DBPCFC) in which patients are fed increasing amounts of the foods in question in a carefully monitored clinical research environment. When conducted by experienced clinical investigators, the risks can be minimized, but a DBPCFC is still associated with the potential for severe allergic reactions, raising complex questions about its use in clinical research.

Recent Advances in Food Allergy Research

Food allergens and their interactions with the immune system.

The majority of well-characterized inhalant and food allergens are water-soluble proteins. However, recent studies indicate that lipids and lipid-carbohydrate complexes (e.g., glycolipids extracted from cypress pollen) can trigger immune and allergic responses. While lipid food allergens have not yet been identified, new studies have revealed the molecular pathways by which lipid and glycolipids can activate the immune system. Cells that express the surface marker CD4 constitute a common subset of the T lymphocytes, known as T helper cells, that circulate in the blood. Recent observations suggest that approximately 60 percent of the lung CD4+ cells in patients with moderate-to-severe persistent asthma may be not conventional CD4+ T helper cells, but a special type of lymphocyte, called a natural killer T (NKT) cell. NKT cells are involved in the immune response to infectious agents and have been shown in mouse models to be involved in the development of asthma. These observations, plus the association of food allergy and asthma, suggest that glycolipid allergens and NKT cells may be involved in other allergic diseases, including food allergy.

Recent advances have also strengthened our understanding of the structure of protein allergens and how they interact with IgE antibodies. Protein structures can now be widely studied through advanced technologies, such as X-ray crystallography and nuclear magnetic resonance, which are capable of revealing three-dimensional structures and protein-protein interactions at the atomic level. Structural information can then be exploited to identify therapeutic targets and design novel drugs. Such structure-based insights may also be important for understanding the interactions between food allergens and the IgE antibodies to food.

Recent Findings

A mechanism which can lead to hay fever and other allergic reactions, by preventing the immune system from regulating itself properly, has been discovered by scientists. Researchers hope their finding, published (December 2007) in the journal PLoS Biology, will allow therapies to be developed that treat allergies by stopping this mechanism.
The new research shows that a gene known as GATA-3 can block the development of regulatory T-cells in the immune system by locking another gene. This gene, FOXP3, is key to regulatory T cells and when it is blocked new regulatory T cells stop being produced. Regulatory T cells are believed to be vital for averting allergic reactions in healthy individuals because they keep the other cells in check, suppressing pro-allergic cells known as Th2 cells and stopping the immune system from needlessly attacking the body. In people with allergies, some types of cells in the immune system, particularly the Th2 cells, wrongly identify a particular allergen, such as pollen, as being dangerous. Whenever the person encounters this allergen again, these cells promote the production of antibodies to attack it, causing an allergic reaction.

**Why Is Scratching So Relieving?**

(Feb 2008) In the first study to use imaging technology to see what goes on in the brain when we scratch, researchers at Wake Forest University Baptist Medical Center have uncovered new clues about why scratching may be so relieving - and why it can be hard to stop. The work is reported online in the Journal of Investigative Dermatology and will appear in a future print issue.

“Our study shows for the first time how scratching may relieve itch,” said lead author Gil Yosipovitch, M.D., a dermatologist who specializes in itch. “It’s important to understand the mechanism of relief so we can develop more effective treatments. For some people, itch is a chronic condition that affects overall health.” “To our surprise, we found that areas of the brain associated with unpleasant or aversive emotions and memories became significantly less active during the scratching,” said Yosipovitch. “We know scratching is pleasurable, but we haven’t known why. It’s possible that scratching may suppress the emotional components of itch and bring about its relief.”

Patients occasionally report that intense scratching - to the point of drawing blood - is the only thing that relieves chronic itch. “This is the first real scientific evidence showing that itch may be inhibited by scratching,” he said. “Of course, scratching is not recommended because it can damage the skin. But understanding how the process works could lead to new treatments. For example, drugs that deactivate this part of the brain might be effective.”

Understanding more about chronic itch is important, Yosipovitch said, noting that more than 30 million Americans suffer from eczema.

**Anaphylaxis**

Anaphylaxis is a systemic reaction to a foreign material or antigen. It is sometimes called anaphylactic shock. The main causes of anaphylactic shock include drugs (especially penicillin), pollen extracts, stinging insects, latex and food. Onset of anaphylaxis can be so sudden, in some instances, it can quickly lead to death. In a severe anaphylactic reaction a patient can die within minutes.

**Signs and symptoms** of a generalized anaphylactic reaction may include the following: Generalized pruritus, profuse sweating, urticaria or angioedema; Mild to severe abdominal pain, gastric dilation, vomiting, diarrhea or melena.

Respiratory tract signs include rhinitis, cough, a feeling of tightness in the chest, pain, wheezing, dyspnea, cyanosis and even respiratory failure. Edema of the upper respiratory airways is very commonly found in fatal human anaphylaxis and is characteristic of it. Cardiovascular involvement include slow, rapid or irregular pulse; hypotension; precordial discomfort; occasionally congestive heart failure; ventricular tachycardia, or cardiac standstill. Involvement of the central nervous system with agitation or dulled senses, loss of consciousness, convulsions, coma or death.

**Treatment**

Rarely does the first symptom begin more than an hour after exposure. Symptoms may persist for hours and may recur, after initial emergency therapy, for 24–48 hours. Severity varies greatly and each case must be treated individually. Immediate therapy is essential since the degree of the anaphylactic shock cannot always be predicted. The best way to prevent anaphylaxis is attention to the patient’s medical history; known sensitivities; skin tests for possible allergies to horse, cow or goat serum; and careful management of any hyposensitization injections.

The patient who is severely allergic can keep an emergency insect sting kit handy. These are
available commercially and all require a prescription.

You can’t always help your patients avoid anaphylaxis. But you can help them avoid its consequences with and EpiPen or EpiPen Jr. auto-injector. It is one of the fastest, easiest self-administered form of epinephrine.

Patient/Family Education Guide

What Are Allergies?

An “allergy” is a sensitivity to something that is ordinarily harmless. When your body tries to get rid of the “allergen” (foreign substance), you experience symptoms like sneezing, watery eyes and a runny, stuffy or itchy nose. Allergens trigger an allergic response in susceptible individuals. They can enter the body via inhalation, ingestion, injection and external skin contact. Typical allergens include pet dander, pollen, dust and mold. These allergens react with antibodies (certain molecules in the immune system) in the allergic person, causing the production of histamine and other chemical substances that cause various symptoms. Thus begins a chain reaction known as the “allergic response.”

Allergic Response Chain Reaction

For example, you may be allergic to pollen. During certain seasons, when the pollen count is high, exposure to pollen (the allergen) sparks an allergic response in your body. This causes histamine release, which leads to sneezing, watery nasal drainage, tearing eyes and other symptoms we know as allergy.

When an allergen triggers this allergic response, a variety of symptoms can occur throughout the body. While we will concentrate on the nasal aspects of allergy, other systems are also affected, including the skin (with eczema and itching) and the gastrointestinal tract (with heartburn).

Why do I have allergies?

When your body mistakes something that is normally harmless for something dangerous, your body tries to get rid of it the same way it fights off an invading bacteria or virus. Your body’s attempt to get rid of the “allergen” (foreign substance) causes symptoms like sneezing, watery eyes and a runny, stuffy, or itchy nose. This is called an “allergic reaction.”

The first time your body encounters an allergen, your immune system may consider it harmful and form antibodies to it. With each repeated exposure, your immune system produces increased amounts of antibodies to the allergen until, eventually, you experience symptoms. With seasonal allergies, a couple of seasons may pass by before you experience any symptoms.

If your body produced an antibody when you were a child, it would still be present in your system when you’re 30—which means long-lived sensitivity to allergens.

Why do allergies affect my nose and eyes?

The medical term for nasal allergy symptoms is “allergic rhinitis.” (“Rhinitis” comes from the ancient Greek word “rhinos” for nose and “itis” means inflammation.)

Your nose filters the air you breathe, preventing unwanted substances from traveling into the lungs. As you inhale, the air circulates over, under and around the inferior, middle and superior nasal turbinates (passages). This process filters, moistens and warms the air.

When you breathe in an allergen like pollen, it gets filtered out and lodges in the mucus that lines the nasal passages. There, it encounters mast cells, which react by releasing histamine. The histamine causes blood vessels in the nose to dilate and leak fluid into the surrounding tissue. When the fluid seeps into the surrounding tissue, it causes swelling, itching and inflammation. As a result, you experience symptoms like a runny, itchy nose and sneezing.

Mast cells are also found in the mucous membranes lining your eyes (called conjunctiva), so if an allergen gets into your eye, you may have itchy, red, watery eyes. They also are found in your lungs, digestive tract and in your skin.

Sometimes your allergies may also affect your sinuses; the air-filled cavities lined with mucous membranes in the bones surrounding the nose. The four facial sinuses—maxillary, ethmoid, frontal and sphenoid—are normally responsible for producing protective mucus that drains into the nasal passages.

Allergy Symptoms

The nasal symptoms of allergy are termed allergic rhinitis. Prominent nasal manifestations include congestion of the nasal membranes, sneezing and itching. Swelling of the nasal lining leads to the sensation of blockage and possibly to headaches. The nasal drainage in allergic patients is usually thin and clear (as opposed to the thick, colored mucus of infections). In adults, this can lead to watery postnasal drip and cough. In children, the itching nose with thin drainage leads to frequent rubbing upward of the nasal tip called the “allergic salute.” Itchy, watery eyes may accompany these nasal symptoms. There may be puffiness and discoloration around the eyes, which is termed allergic shiners (black eyes of allergy). When al-
Here are some tips:

- Wear a surgical mask or cover your face with a scarf when engaging in outdoor sports, mowing grass or gardening.
- Avoid hay fields and tree groves.
- Stay close to water. Pollen can travel for miles through the air but gets trapped in water.
- Bathe pets regularly to reduce pelt oil.
- Close bedroom windows.
- Eliminate dust mites by removing carpet from the bedroom, washing bed linens in very hot water, covering pillows and mattress with plastic covers.
- Use Dacron-fill pillows. Avoid feather pillows and down-filled comforters.
- Prohibit smoking indoors.
- Avoid mold-containing foods, such as wine, beer, alcohol, cheese products and sourdough breads.
- Do not wear colognes or cosmetics with perfumes.
- Use unscented soaps, lotions and laundry powders.

Who gets allergies?

According to the American Academy of Allergy, Asthma, & Immunology (AAAAI), each year more than 50 million Americans suffer from allergic diseases, negatively impacting quality of life and escalating healthcare costs to over $18 billion annually. The prevalence continues to grow, reflecting both increased exposures and enhanced responses to allergens. Allergic rhinitis, the most common type of allergy, affects more than 20 million Americans. Sensitivity often starts in childhood or young adulthood.

Although experts do not fully understand why some people develop allergies and others don’t, allergies do tend to run in families. Genetics play a key role.

The Family Factor

If you have ever wondered why or how you’ve developed allergies, you may only have to look as far as your parents to find the answer. Just as your hair color, eye color, tendency to develop freckles and blood group are inherited from your parents, so is the genetic disposition to have allergic responses.

The genetic disposition for allergy may explain why some people have allergy symptoms and others do not. To have an allergic reaction, you must be exposed to an allergen (a substance that causes an immune response or hypersensitivity in your body). For example, you may inherit the ability to become allergic to an inhalant. However, if you don’t come in contact with a particular inhalant, like ragweed pollen, you will not experience an allergic reaction to it. One only develops allergies to inhalants to which they have become exposed.

How likely are you to develop allergies? In various studies focusing on parents and their children who have allergies, researchers discovered that there is, indeed, a pattern of inheritance. The studies suggest if both parents have allergies, a child’s chances of developing allergies are 75% to 80%. If only one parent has allergies, a child’s chances of developing them are about 25%.

However, a child won’t necessarily be sensitive to the same allergens as his or her parent. A person is less likely to inherit a sensitivity to a specific substance than they are to inherit the general tendency to develop allergies.

Early exposure to possible allergens (allergy-causing substances) like cat dander or irritants like cigarette smoke is also believed to increase a child’s chances of developing allergies.

When do allergies appear?

People can develop allergies for the first time at any age. It is not unusual to acquire new allergies when you are in your 60s. In children, allergies can sometimes diminish as they grow older. Prompt care and treatment can help diminish allergy symptoms.

How do allergies develop?

Your immune system fights off harmful foreign substances like bacteria and viruses by making antibodies to them. Each antibody recognizes and binds to one specific foreign substance – like a key fitting into a lock. Millions of different antibodies circulate in your bloodstream and are present throughout your body to help fend off any unwanted substances.

The antibodies usually involved in allergic rhinitis are called “immunoglobulin E” (IgE). IgE binds to receptors located on certain cells in the nasal lin-
ing called basophils and “mast cells,” which contain granules of a chemical called “histamine.” When IgE binds to these cells, they “degranulate,” releasing histamine. The released histamine latches onto nearby blood vessels, causing them to dilate (widen). This results in swelling, redness and inflammation and leads to unpleasant symptoms such as an itchy, stuffy or runny nose.

Each allergen produces a distinct set of IgE antibodies. You may have several different IgE antibodies in your body, indicating multiple allergies. The quantity of IgE antibodies present determines the strength of your allergic reaction. The more IgE antibodies you have to a specific substance, the more pronounced the reaction will be.

**Environmental factors** are widespread causes of allergy. Most are termed inhalant allergies and are due to substances we breathe. These microscopic particles in the air can lead to a full-blown allergic response. Commonly, these environmental allergens produce symptoms during particular seasons of the year and are termed seasonal allergies.

**What are seasonal allergies?**

“Seasonal allergic rhinitis” describes nasal allergies that change with the seasons due to pollen from plants. “Hay fever,” a popular term for seasonal allergies, was coined in 1828 by a British physician, Dr. John Bostock, who noticed that his symptoms worsened during the British haying season. (The expression is misleading because allergies seldom cause a fever and are rarely related to hay.)

If you have seasonal allergies (hay fever or seasonal allergic rhinitis), you are allergic to pollen from trees, grasses or weeds that are carried by the wind. Your symptoms arise during the pollination seasons for those particular plants.

You can have allergies to more than one thing, so your symptoms may get worse more often than once each year. For example, you may have difficulty in the spring due to tree pollen, but have no relief in the fall because you are also allergic to ragweed. No two people are exactly the same.

Your doctor can help you pinpoint what the causes of your allergies are and how best to treat them. Giving your doctor detailed information about your lifestyle and habits will help determine your problem and provide you with relief from your symptoms.

### What are perennial allergies?

“Perennial rhinitis” describes year-round nasal allergies, which are caused by substances like dust mites, mold spores, feathers or pet dander.

If you have “perennial allergies,” you are allergic to something that affects you year-round and does not change with the seasons—such as dust mites, which can be found in mattresses; pet dander or pet saliva; or mold spores and dust, which can be throughout your home. Your symptoms may bother you continuously, or they may flare up several times throughout the year.

It is possible to have more than one type of allergy. For instance, house dust may exacerbate symptoms in late fall, when your heater is turned on. Other environmental clues are allergies to cats and dogs, seen after exposure to these household pets. Allergy symptoms that are made worse in bed each night may be caused by allergies to pillow feathers. Or you may be allergic to pollen as well as mold spores. If you suffer year-round and your symptoms worsen seasonally, your symptoms may be caused by a combination of seasonal as well as perennial allergens.

### Is it allergies or a cold?

Although allergies and colds have similar symptoms, there are some signs that can help you tell the difference between them. It’s probably an allergy if:

- You have no fever.
- Mucus secretions are clear and runny.
- Sneezes occur in rapid, multiple sequence.
- Itchiness in nose, ears and throat (especially the palate or roof of the mouth) is present.
- Symptoms last longer than the typical duration of a cold, which is usually 7 to 10 days.

### Allergies and Their Relation to Sinus Disease

Sinus infections occur when there is blockage at the openings (osti) of normal sinus drainage. One factor that can lead to ostia blockage is allergies. When an individual’s allergies are triggered, there is swelling of the nasal linings, which results in sinus blockage and infection. If you seem to get sinus infections during the same time each year, there may be a component of seasonal allergy.

Additionally, polyps, which can underlie sinus disease, are associated with allergy. The incidence of allergy in nasal polyp patients has been found to be up to 60%, although the cause-and-effect aspect of this is not fully understood. While not all patients with chronic sinus disease or nasal polyps
need intense allergy evaluation, if symptoms occur, with allergic rhinitis (thin, watery drainage with sneezing, etc.), then allergy factors need to be considered. The following table should help you decide if your nasal symptoms are infection-related or if they are caused by allergies.

**Can allergies give you hives?**

Allergens or other irritants can affect your skin, resulting in a condition called urticaria or hives. Hives are raised, red, itchy patches of skin, sometimes called welts. They vary in size and may last a few minutes to a few days. They can develop anywhere on the body, including the face, lips, tongue, throat or ears. The exact cause of hives can sometimes be difficult to determine. Your doctor can help treat these symptoms. If you experience dizziness, wheezing, difficulty breathing, tightness in the chest, or swelling of the tongue, lips or face along with hives, you should contact your doctor immediately.

**Other allergies**

Inhaled allergens are considered the most common cause of allergies, but there are many other causes of allergies too — including food, latex, drugs and insect stings.

An exaggerated response to specific food allergens is termed food allergy or hypersensitivity. People may crave food to which they are allergic.

Food allergies are common in children, although many people lose their sensitivity to foods over time. Some people have severe and possibly life-threatening reactions after eating or drinking “trigger” foods such as shellfish, eggs, milk, wheat, chocolate, citrus fruits or nuts.

Some people may also experience “cross-reactivity” with certain foods that have chemicals similar to those found in non-food allergens. For example, a person who’s sensitive to birch pollen may have a cross-reaction to apples, carrots, parsnips, celery, hazelnuts, potatoes or kiwi.

Sensitivity to penicillin, stinging insects, shellfish, peanuts or latex can cause anaphylaxis, a potentially fatal allergic reaction that causes swelling throughout the body and a sudden drop in blood pressure. The throat and airways may also become constricted. If you have suffered from an anaphylactic reaction in the past, then you should carry around an injectable shot of a medication called epinephrine (adrenaline), which can be given in an emergency to open up your airway.

A skin allergy called “contact dermatitis” may arise when the skin comes into contact with a plant allergen like poison ivy.

“Allergic conjunctivitis” describes an allergic inflammation of the lining of the eyes.

**Allergy Testing**

Allergy tests identify allergens to which you have sensitivity. Usually, but not always, these allergens cause your allergy symptoms. The procedure is simple. The test results should confirm what the doctor learned from your history.

**Skin Testing**

Skin testing is usually considered to be the most accurate and cost effective. Skin testing is performed by piercing or scratching the skin and then placing droplets of potential allergens (dust, grass pollen, tree pollen, dog, etc.) on the scratch. If the spot swells, reddens and itches, then you are sensitive to that allergen. In most cases, if the person does not react to skin testing then “intradermal” testing will be done.

**Intradermal Testing**

Intradermal testing requires injecting allergen under the skin. This test works the same way as the skin testing, but uses a stronger form of the allergen.

Some patients feel frustrated when their tests show they’re sensitive to a lot of things. This frustration is understandable. Yet, knowing which allergens can make you sick may guide you and your doctor toward solutions well worth investing time and energy in.

**Radioallergosorbent Testing (RAST)**

This is a blood test for allergies. This test measures IgE in the blood. IgE is a chemical in the body that reacts with an allergen to cause an allergic reaction. IgE must be present to be classified as an “allergic response.”

The level of the IgE for each allergen in the body can be measured. When the IgE reacts with the specific allergen, the combination activates the allergy cell (mast cell). This type of testing is more expensive and less reliable than skin testing. However, it should be used when a person has a rash that would interfere with the reading of the skin test, when a person cannot tolerate multiple injections or cannot stop taking their antihistamine prior to the skin testing.
Treating Your Allergies

Allergy Prevention

The best way to avoid symptoms of nasal allergy is prevention. This means avoiding exposure to agents that trigger the allergic response. Being aware of common allergens (things that cause allergy) will enable you to minimize your exposure to them. The following suggestions will not apply to every allergic individual, but you can judge which items apply in your case.

Dust is by far the most replaced with washable cotton or fiberglass curtains. Venetian blinds are dust collectors and should be avoided. Closet doors should be kept closed and wool clothing should be placed in plastic bags. Since rugs catch and hold dust, bare wood floors or linoleum are best in the dust-free bedroom. The dust-allergic patient can also prevent allergy attacks by wearing a mask when working in dusty places, making up beds and emptying the vacuum.

Forced hot-air heating systems are notorious for circulating dust, but this dust circulation can be reduced with frequent changing or cleaning of the filter and with the use of damp cheesecloth over room air vents. When dust allergy continues to be a problem, you can install an electrostatic air filter adjacent to the central hot-air blower (sometimes this can be a legitimate tax deduction, with a physician’s note). An electric heater is much preferred to the hot-air system in allergic households. If a hot-air system already exists, then it should be closed to the allergic person’s bedroom and an electric strip heater installed.

If you have seasonal pollen and underlying pollen allergies, you will recognize your symptoms during the same season each year. For example, in the Eastern United States, grass and tree pollens predominate from April to June; ragweed is common from mid-August to early October. In other sections of the country, different plants cause symptoms during different seasons. Plants that are wind-pollinated produce large amounts of lightweight pollen that can be carried hundreds of miles, triggering an allergic response in susceptible individuals. On the other hand, flower-bearing plants are insect-pollinated, producing heavier, stickier pollen that usually doesn’t cause an allergic reaction. If possible, try to avoid exposure to plants that will cause problems.

If you are sensitive to pollen, you should avoid cutting grass, weeding and exposure to wooded areas. If you must do these gardening chores, wear a filter mask and eyeglasses. When it’s your allergy season, spend as much time as possible in an air-conditioned house or car (remember to keep the windows of your house and car closed). Don’t bring dried-flower arrangements inside. Since the seashore and mountain areas tend to be pollen-free, you may want to plan a vacation there during the height of pollen season at home. To get an idea of how your symptoms may be each day, you can get the daily pollen count through the Pfizer’s Pollen Count Information Lines (800-9-POLLEN or 877-9-ACHOOO) or the Web site for the American Academy of Allergy Asthma & Immunology (www.aaaai.org). Your local news may also provide the level of pollen in the air in your area.

Mold is a fungus that commonly causes inhalant allergies. There are many varieties of molds, both indoor and outdoor. Molds flourish in cold, damp areas, especially in basements or storage areas. Stuffed furniture is often loaded with mold. While stuffed animals can be a source of mold, if you put them in the dryer for twenty minutes, the heat will kill most of the mold. Barns, dried leaves, cut grass and dead vegetation are sources of mold. Mold can be minimized with the use of electric dehumidifiers. As a reminder, humidifiers and cool-air vaporizers, which are intended to relieve allergy symptoms, may actually be a source of mold if not regularly cleaned.

Tobacco and smoke can trigger a strong allergic response in some individuals. These people should avoid smoking themselves, as well as avoid secondhand smoke. Other sources of allergy include mothballs, insect spray and fresh paint. If symptoms grow worse during the Christmas season, when a Christmas tree is brought into the house, try an artificial tree. Nasal congestion during swimming may be caused by a chlorine allergy.

Avoidance in patients with food allergies is somewhat more complex. You may first want to eliminate processed food, since the mere avoidance of chemical additives, sugars, salts, yeast, soy and spices may be enough to curb allergy symptoms. You may need to ask your doctor about a food-rotation diet, which is designed to prevent sensitization to certain foods.

Breast-fed infants are much less likely to develop allergies than those who receive cow’s milk. Breast-feeding should be considered if there is a strong family history of allergy. If this is not feasible, then with your pediatrician’s permission, try an allergy-free, soybean or goat’s milk.

Animals are another frequent source of allergies. While most patients refuse to give up their dog, cat or bird (these are the most common allergy-causing animals), some people will agree to keep the animal out of the living or sleeping quarters, or perhaps get a different pet. If you feel that
you cannot live without a dog, then your best bet is a poodle, which is considered less of an allergic threat than dogs that shed hair freely. Fish are probably the best pet for the allergic child, since they have no fur or feathers.

How Are Allergies Treated?
Experts agree that the best way to treat allergies is to avoid exposure to the allergens in the first place. But sometimes that’s impossible to do. Many different treatments are now available to relieve allergy symptoms, ranging from over-the-counter antihistamine medications to allergy shots. Because different treatments have different benefits and drawbacks, it is best to see your doctor to determine which treatment is best for you.

Some common medications used to treat allergies include antihistamines and decongestants.

Antihistamines are often used to relieve mild-to-moderate allergy symptoms like itching, sneezing and runny nose. A decongestant may help relieve a stuffy nose. Sometimes, an antihistamine and a decongestant are used together to relieve multiple symptoms.

What are antihistamines?
“Antihistamines,” available by prescription and over-the-counter, help reduce the sneezing, itching and runny nose resulting from an allergic reaction. They work by blocking the action of “histamine,” a potent chemical that is released from normal cells when you inhale an allergen. Antihistamines are most effective if they are taken as directed.

One disadvantage of many antihistamines, especially those available over-the-counter, is that they can cross the “blood-brain barrier.” This means they can travel easily from the bloodstream into the central nervous system.

Antihistamines may cause sluggishness or drowsiness. This “sedating” effect can be magnified if you combine the medication with alcohol or with certain other sedating medications. The severity of drowsiness varies among products. You should discuss any questions you may have about taking sedating antihistamines with your doctor.

“Non sedating” antihistamines are now available by prescription and OTC (i.e. loratadine [Claritin]). These do not easily cross the blood-brain barrier and therefore usually do not cause drowsiness when taken at the recommended dose. (Any over-the-counter medication for cold and “sinus” that is labeled “non drowsy” or “non sedating” doesn’t contain any antihistamine, only a decongestant.) Unlike over-the-counter antihistamines, which must be taken more than once a day for maximum benefit, these prescription antihistamines are longer-acting and some can be taken just once a day.

How do antihistamines work?
When you inhale an “allergen,” “mast cells,” located in the membrane lining the nose and sinuses, release a chemical called “histamine.” Histamine attaches to receptors on nearby blood vessels, causing them to dilate (enlarge). Histamine also binds to other receptors located in the nasal tissues, leading to redness, swelling, itching and changes in the secretions.

Antihistamines “block” the histamine receptors, preventing these membrane changes and the resulting symptoms. Antihistamines also block histamine from stimulating nerve endings, which can cause itching and other symptoms.

What are decongestants?
“Decongestants” shrink swollen nasal tissues by constricting blood vessels. This reduces blood flow to the mucous membranes, decreases swelling and opens breathing passages. Decongestants are available over-the-counter or by prescription, as nasal sprays and as oral medications.

Nasal sprays or drops can work quickly to relieve symptoms. Unfortunately, when used more often or longer than recommended, these products can have an unexpected effect: Nasal congestion, stuffiness and swelling may increase (the so-called “rebound reaction”). Decongestant nasal sprays or drops should not be used more often than directed (3 to 7 days, depending upon the medication).

“Oral decongestants” don’t cause this rebound reaction, but they take a little longer to work. Because they stimulate the central nervous system, they may cause jitteriness and interfere with sleep. Decongestants are often the main active ingredients in “non drowsy” over-the-counter cold and decongestant medications.

How do decongestants work?
When blood vessels dilate (enlarge) in response to the effects of an allergen, increased fluid accumulates in the nasal lining, causing swelling and greater mucus production. “Decongestants” narrow blood vessels in the membranes that line the nose. This reduces swelling and the amount of mucus produced by the nasal lining.

How do antihistamines and decongestants work together?
Some allergy medications contain both an antihistamine and...
a decongestant to treat multiple symptoms. The antihistamine/decongestant combination may relieve itching, sneezing and a runny nose by blocking histamine action while also clearing the nasal passages.

It is best to consult with your doctor to determine which treatment option is best for your particular symptoms and situation.

Other treatments for allergies

In addition to antihistamines and decongestants, Nasal Sprays and Immunotherapy are used to treat allergies. Ultimately, your doctor will help determine which treatment is best for you.

About Nasal Sprays

Available over-the-counter and by prescription, nasal sprays can also be part of your defense against allergies.

- Corticosteroid nasal sprays, available by prescription only, are used daily to relieve congestion. They generally take at least a week to achieve maximum benefit.
- Nasal sprays containing cromolyn sodium are also available to prevent sneezing and an itchy, runny nose caused by mild to moderate allergies.
- Nonprescription nasal sprays containing a salt-water solution are sometimes used to relieve mild congestion, loosen mucus and prevent crusting. They may be taken safely until symptoms improve.

About Immunotherapy

If you have been unsuccessful finding relief with any of the other choices, immunotherapy (allergy shots) may be the solution. This treatment option has proven effective for millions of allergy patients.

Immunotherapy may take up to 6 to 12 months to begin relieving symptoms. Allergy shots require increasing doses of the allergen. Over time, you will become less sensitive to exposure to the allergen. After reaching a maximal dose in 6 to 12 months, injections will become less frequent. The entire process can take up to 3 to 5 years. Of course, immunotherapy is only part of the treatment plan to control allergies. Avoidance is the mainstay of allergy management. Some allergens can be difficult to avoid and the effectiveness and side effects of medications must be considered.

For many people, a combination of allergy management approaches is necessary.

If you fight moderate to severe allergies for 3 months or more each year, immunotherapy may offer an effective treatment alternative.

Complementary and Alternative Therapies

Quercetin is a bioflavonoid from buckwheat and citrus fruits

Used for:
- Hay fever
- Hives
- Allergies (when taken regularly for at least 6 to 8 weeks)

Available in: Tablets, powder

Herb/drug interactions: None known

When buying: Look for 400 mg. coated tablets, avoid the powder

Warning: None

DOSAGES – Adults: 400 mg. twice a day between meals
Children under 10: Half the adult dose

Stinging Nettle Plant (Urtica dioica) leaves of the stinging nettle bush

Used for: Hay fever

Available in: Capsules

Herb/drug interactions: None known

When buying: Look for capsules of freeze-dried leaves

Warning: None

DOSAGES – Adults: One to two capsules every two to four hours as needed

Children under 10: Half the adult dose

Garlic (Allium sativum)

Fresh or dried pieces of the garlic bulb

Used for:
- Common cold, sore throat; a natural antibiotic and antiviral
- Ear infections in children
- High blood pressure, high cholesterol
- Fungal infections
- Chronic or recurrent infections; frequent yeast infections; low resistance to infection

Available in: Raw cloves, dehydrated powder, oil, extract in tablets or capsules, tinctures

Herb/drug interactions:
- Garlic thins blood, so large amounts should not be taken with coumadin or other blood-thinning agents.

When buying: Buy fresh, raw garlic. Chopping or mashing garlic releases the herb’s full potential as the active component, allcin, forms only on contact with air. Commercial garlic capsules do not preserve the full activity of the fresh bulb and are consequently less effective. To make garlic oil, crush a few cloves into some olive oil. Let the oil sit a few days at room temperature, and then strain. Keep the oil in a container in the refrigerator and warm a
bit as needed. If you use powders, tinctures or other commercial garlic products, choose those standardized for allicin content.

**Warning:** Remember: A clove of garlic is one segment in a head (the entire bulb).

**DOSAGES –**

**Adults:** Two cloves of raw garlic at the first sign of a cold. Mash them or chop finely and mix with food, or cut cloves into chunks and swallow them whole like pills (if you don’t chew, the garlic won’t stay on your breath); two cloves per day for chronic or recurrent yeast infections or low resistance to infection.

**Children under 10:** Raw garlic is too strong. Use garlic pills instead. For ear infections, a few drops of warm garlic oil in the ear canal.

**Herbal Treatment for Children**

**Astragalus** (*Astragalus membranaceus*) is a Chinese herb that helps to strengthen the overall constitution. Give your child one dose daily for one month before the hay fever season.

*Note:* This herb should not be given if a fever or any other signs of infection are present.

**Echinacea** If your child suffers from chronic allergies, give him one dose of an echinacea and goldenseal herbal combination formula, two to three times daily, for five to seven days to strengthen his immune system.

*Note:* You should not give your child echinacea on a daily basis for more than ten days at a time, or it will lose its effectiveness.

**Prepare a fenugreek and thyme tea.** These herbs act as a mild decongestant to relieve nasal and sinus congestion. Give your child one dose of tea, twice daily, as needed.

**Garlic** has antibacterial properties that are beneficial in healing a chronic runny nose. Choose an odorless form, and give your child one capsule, twice daily. It can be taken in whole capsule form, or you can open a capsule and dissolve the liquid in warm water or soup.

**Licorice root** has a strengthening effect on the adrenal glands. Give your child one dose daily for two weeks before the hay fever season. Licorice and astragalus can easily be combined.

*Note:* This herb should not be given to a child with high blood pressure.

**Ma huang** is the original source of the decongestant pseudoephedrine (better known as Sudafed), and it is effective in relieving nasal congestion. Give your child one dose in tea form, twice a day, for up to three days.

*Note:* This herb can stimulate the nervous system, causing an increased heart rate and agitation. Do not give it to a child under thirteen, and do not give it after 3:00 p.m.

**Minor bupleurum** helps to strengthen the immune system. For chronic allergies, give your child one dose, twice daily, for two weeks out of every month. Continue this regimen for three months.

*Note:* Minor bupleurum should not be given to a child with a fever or any other sign of an acute infection.

**Nettle** can be very helpful for drying out the sinuses. It can be highly effective for chronic allergies (allergic rhinitis), especially when taken in freeze-dried form. Give your child one dose, three times daily, for three to four days.

*Note:* Some children experience stomach upset as a result of taking nettle. If this happens, stop giving the herb. This herb should not be given to a child under four.

**General Recommendations**

A child over twelve can take pantothenic acid (Vitamin B5) during the hay fever season to prevent the onset of allergies (you can also try giving it during an attack to help lessen the symptoms). Give your child 100 milligrams, three times a day, for three to four weeks. Choose and administer an appropriate homeopathic remedy. Give you child vitamin C with bioflavonoids, beta-carotene, garlic, and evening primrose oil. Saline nasal irrigations are valuable for a child with a chronic runny nose. Because allergy symptoms can take a wide variety of forms, from headaches to bedwetting, you may wish to consult other sources that address your child’s particular symptoms.

**Dosage**

Unless otherwise specified, use the following age-specific dosage equivalents when administering herbal remedies:

**Newborn to two years**

One dose equals 3 drops of tincture diluted in 1/4 cup of water, formula, or breast milk, or 2 to 3 teaspoons of tea. A nursing mother
may also take an adult dose of the appropriate herbal treatment. The herbs will be transmitted to her baby through her breast milk, filtered and diluted to the appropriate strength.

**Two to six years**
One dose equals 6 to 10 drops of tincture diluted in 1/4 cup of water, or 1/4 cup of tea.

**Six to twelve years**
One dose equals 10 to 20 drops of tincture, 1/2 cup of tea, or 1 tablet or capsule.

**Twelve years to adult**
One dose equals 20 to 40 drops of tincture, 1 cup of tea, or 2 tablets or capsules.

### Homeopathy

Homeopathy can work simply and effectively in resolving allergy symptoms. Select a symptom-specific remedy and, unless otherwise specified, give your child one dose, three times daily, for three days. If there is no improvement, try another remedy. If you do notice an improvement, discontinue the remedy and watch to see your child’s response. If the symptoms return, resume giving your child one dose, three times daily, for another two days. If the problem is not resolved, it may be helpful to consult a homeopathic practitioner who can prescribe a constitutional remedy.

**Allium cepa** 30x or 9c is good for the child who experiences bouts of sneezing with a burning sensation in the nose that affects the upper lip and inside of the nose. There is a feeling that the nose is stopped up even though there is a flowing nasal discharge. This child will lose his sense of smell, and may also experience a tickling feeling in his throat.

**Arsenicum album** KM 30x or 9c helps the child who is sneezing, with nasal burning, and who feels better with hot compresses on the sides of his nose and when breathing into a warm humidifier. Restlessness, fatigue, cold hands and feet, and waking in the night with great distress are symptoms of the Arsenicum child. Often he will not only have allergies to dust and mold, but will be highly sensitive to cats as well. This child may also have food allergies to milk, wheat, or sugar, and be high-strung.

**Calcarea carbonica** 30x or 9c benefits the child who is pale and sweats a lot, especially around the head, and is sensitive to drafts. Swollen glands may accompany this child’s runny nose. He may have digestive problems as well. This child may have gone through teething and/or learned to walk later than friends or siblings.

**Euphrasia** 30x or 9c, which is homeopathic eyebright, is good for the child with burning tears and a nonacrid nasal discharge. Often this child will develop conjunctivitis along with his allergies. He is very sensitive to light and prefers to stay indoors in a dimly lit room.

Give **Hydrastis** 12x or 6c to the child who has a thick yellow or yellow-green discharge from the nose. Very often mucus will form crusts around this child’s nose. Hydrastis is homeopathic goldenseal.

**Natrum muriaticum** 12x or 6c is for the child who complains that the inside of his runny nose hurts or burns. This child will have thick mucus, may have a sore or pustule between his nose and upper lip, and his lips will be dry and cracked. He likes – perhaps even craves – salty foods.

**Pulsatilla** 30x or 9c will help the child who feels much worse in a stuffy room and better in the cool, open air. This child prefers to sleep with his window open. His nasal passages are congested and dry at night, with a nonirritating yellow discharge during the day. This child often has a fair complexion, blond or light brown hair, and blue eyes. **Pulsatilla** children are good-natured, compliant, and adoring – except, of course, when they suffer with allergies. **Pulsatilla** is homeopathic windflower (anemone). For the child whose moods and symptoms change like the wind, homeopathic windflower works wonders.

**Sabadilla** PR 30x or 9c is helpful for the child who experiences spasmodic sneezing with a lot of nasal discharge and a peculiar itching of the nose and soft palate. This child will want to scratch his upper palate. Exposure to flowers often increases the itching and sneezing.

If your child has had a runny nose since receiving a vaccination, give him **Thuja** 30x or 9c, twice a day, for two days. This is for a child who is sensitive to cold and humidity, and has a tendency to develop warts.

If none of the above remedies seems to match your child’s situation, there are homeopathic combination formulas available that may be useful.

### The Promise of Probiotics

When Finnish researcher Erika Isolauri, MD, Ph.D., treated children with severe eczema, she discovered a seemingly paradoxical effect: The children’s eczema cleared up after they received a probiotic supplement which contains beneficial bacteria. Why would treating the gut affect a skin condition? Dr. Isolauri
suggests it’s because probiotics restore the gut’s natural bacterial balance, reverse leaky gut syndrome, and reduce allergic inflammation. The eczema improved because the supplements treated its real cause: an underlying food allergy.

Such research has sparked interest in the use of probiotics as a treatment for other allergies. Probiotics are the best source of beneficial bacteria, which is also found in yogurt with live cultures. It is recommended to take daily supplements containing the equivalent of at least 20-30 billion live organisms.

Other natural practitioners recommend eating a diet rich in low-fat plain yogurt, kefir, miso, and sauerkraut. In addition, you can support the growth of acidophilus, lactobacillus, and bifidobacteria by eating foods that contain an indigestible carbohydrate called FOS. Among the best sources of FOS are bananas, garlic, honey, onions, chicory, soybeans, tomatoes and especially Jerusalem artichoke.

**FYI - The Common Texas Ailment**

Like the White-tail deer, and just as common, the mountain cedar continues to persist in the Texas Hill Country. Almost ubiquitous, the tree has become viewed as the affliction of ranching, development and water management. Today, people literally hate the tree.

The mountain cedar, alias Ashe juniper, blueberry juniper, post cedar, cedro, sabino, rock cedar, and Ozark white cedar, grows everywhere. Come winter every year, their clouds of yellow pollen roll down from the hillsides so as to plague you with months of sneezing, water eyes and itching. Enter that most famous allergy: cedar fever.

If cedar fever lasted only a few days, no one would think twice; but it doesn’t. It lasts up to three or four months. Once cedar pollen gets into your system, its evil nature is revealed. Compared with it, ragweed is a wimp. The signs are unmistakable: the eyes burn and turn fiery red; the nose runs; the insides of the ears itch. Incessant sneezing—up to two or three hundred times a day...On top of this, an insidious malaise sets in, making it hard to do anything but stare vacantly at the wall...

The key is the biochemical structure of cedar pollen’s protein coat, which appears to have properties that make it unusually noxious. Then there’s the sheer quantity of the grains. In a rainy year the trees produce tons, and the pollen count, the Richter scale of allergy, goes through the roof. Just before releasing pollen, male Ashe junipers will appear painted burnt-gold.

**Cedar Fever Remedies**

So what can you do if plagued with the fever? There are as many treatments for cedar fever as there are ways to describe the fever. Every winter feverish desperados scavenge doctor offices and drug stores for OTC drugs, such as Chlor-Trimeton, Dimetapp, Tavist-D and NasalCrom and prescriptions for Flonase, Hismanal, Seldane, Zyrtec and Claritin. For those who don’t want drug induced gogginess or hyperactivity, try herbs. Some good herbal remedies used for treating cedar fever are Insure Herbal, astragalus, and nettles which help build up your own natural antihistamine & oat straw which supports the nervous system.

There is an old saying that the remedy for any ailment can be found within the vicinity of that which caused the ailment. In the case of cedar fever, the remedy is the tree. Old-timers ward off cedar fever by chewing 2-4 juniper berries per day, starting a month before and continuing through cedar fever season. The berries taste like pine with rosemary. The berries are an excellent diuretic. Do not eat them if you have bladder problems or you are pregnant.

The berry preventative could be viewed as something that helps the body adapt to an allergen. Once adapted, the body’s natural defenses will no longer trigger the allergic reaction. This is the premise of allergy shots. Getting shots for 4-5 years builds immunity for most fever sufferers and can last 20 years.

**Fascinating Facts**

**Did you know...?**

- If you're sensitive to aspirin (acetylsalicylic acid), you should be aware that certain foods contain high amounts of natural salicylates and could potentially cause an allergic reaction. These include almonds, apples, apricots, black and boysenberries, cherries, cucumbers, grapes, oranges, peaches, pickles, and tomatoes.
- What’s the temperature of your Wash Water? Dust mites on washable fabrics will die if the material is washed in water that is at least 130 degrees F.
- Second Hand smoke can trigger an asthma attack and aggravate symptoms in people with allergies.
- You can clean your home naturally and reduce the chance of accidental poisoning attributed to cleaning products—Instead try:
  --Disinfectant: 1 ½ C of Borax in 1 gallon of HOT water, or 10 drops grapefruit seed extract in 1 gallon WARM water
  --Fabric Softener: ¼ C vinegar added to rinse water
  --Furniture Polish: 2 T olive oil mixed with 1 T vinegar and poured into 1QT. warm water. Keep in a spray bottle. To use heat in a bucket of hot water. (Test a small area first)
  --Laundry whitener: Borax
---Scouring powder: Baking soda on a sponge
---Stain Remover: Hydrogen peroxide, sea salt, or lemon juice (test a hidden area first for color fastness)
---Glass Cleaner: ½ C vinegar in 1 gallon water

• Amazing fact: Pollen has been found floating in the air 400 miles out at sea and 2 miles up in the sky.
• Dehydration is bad for everyone, especially those with allergies—Drink at least 8-10 glasses of water a day to help eliminate irritants and toxins from the body. To determine what is optimal for you, Take your weight in pounds, multiply by .04, which equals pounds of water lost. Multiply that number by 2, to determine the number of cups you need per day.
• Stock up on Allergy-Fighting Superfoods: Apples, broccoli, Borage oil, ginger and turmeric spices, Spirulina, yogurt and zinc-rich foods like tofu, crab, lentils & legumes.
• Little Known Asthma Triggers: Perfumes, Scented soaps, Food additives (sulfites), Mice, and Pine resin from Christmas trees.

Face it. It’s part of being a Texan. The trees are here to stay, and so is the allergy.

Resource & Support Groups

National Institute of Allergy and Infectious Diseases (NIAID)
www.niaid.nih.gov/publications/allergens/full.htm

American Lung Association
1.800.LUNG.USA
www.lungusa.org

Asthma and Allergy Foundation of America
1.800.7.ASTHMA

AAA AI (American Academy of Allergy, Asthma, & Immunology) www.aaai.org or 1.800.822.2762 for the Allergy Report.

Allergy Control Products, Inc. 1.800.422.DUST or www.allergycontrol.com

Allergy to Latex Education and Resource Team (ALERT)
P.O. Box 13930 Milwaukee, WI 53213-0930 1-888-97-ALERT (972-5378) www.latexallergyresources.org

Additional Web-sites:
www.zyrtec.com
www.TheAllergyReport.com
www.NationalPollenNetwork.com
www.allernet.com

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Nomicos EY

“Myrrh: medical marvel or myth of the Magi?” *Holist Nurs Pract*, 2007 Nov-Dec; 21(6): p308-23


1. Allergy is defined as a(an)  
A. normal physiologic or biologic reaction  
B. adverse physiologic or biologic reaction  
C. hypersensitivity to a substance common in most people  
D. none of the above

2. Studies of allergy must be based on the ________ process, the root of all allergic reactions.  
A. physiological  
B. psychological  
C. immunological  
D. sociological

3. An antigen is defined as a substance that  
A. causes the formation of antibodies by the body  
B. causes the formation of allergens by the body  
C. causes the formation of cholinesterase by the body  
D. causes the formation of vitamins by the body

4. All blood cells in the body start out from?  
A. nerve cells  
B. muscle cells  
C. tissue cells  
D. bone marrow(stem cells)

5. Which cells are responsible for “humoral immunity”?  
A. A-cells  
B. B-cells  
C. C-cells  
D. T-cells

6. Which cells are responsible for “cellular immunity”?  
A. A-cells  
B. B-cells  
C. C-cells  
D. T-cells

7. Principal immunoglobulin in milk, saliva and tears:  
A. IgA  
B. IgD  
C. IgG  
D. IgM

8. Globulin formed in almost every immune response during the early period of the reaction:  
A. IgA  
B. IgD  
C. IgG  
D. IgM

9. Principal immunoglobulin in human serum:  
A. IgA  
B. IgD  
C. IgE  
D. IgG

10. Important in the forming of reagin and ultimately, antibodies:  
A. IgA  
B. IgD  
C. IgE  
D. IgM

11. Chemical mediators released in the blood when an antibody combines with an antigen include:  
A. histamine  
B. serotonin  
C. slow-reacting substance of anaphylaxis  
D. all of the above

12. Sensitization is a _____ reaction where specific antibodies develop in response to an antigen.  
A. chemical  
B. acquired  
C. physical  
D. learned

13. Receptors have a specialized reacting surface with the ability to:  
A. bind with immunoglobulin E  
B. react with certain drugs or hormones  
C. both A & B  
D. do not have any specialized ability related to allergy

14. In allergic sensitization, when chemical mediators are released in the respiratory tract, the mediators cause:  
A. contraction of bronchial smooth muscle  
B. increased mucous secretion  
C. accumulation of eosinophils  
D. all of the above to occur

15. Which nonimmunologic factor(s) can cause allergic symptoms?  
A. air pollution  
B. sudden changes in temperature  
C. infection  
D. all of the above can cause allergic symptoms

continued on next page
16. Low concentrations of which immunoglobulins are normally present in all individuals, both on the mast cells and in serum?
A. IgA
B. IgD
C. IgE
D. IgM

17. Before a person can become allergic to a substance, what needs to occur?
A. They must inherit the allergy from their parent(s).
B. Exposure, in substantial amounts, over prolonged periods must occur.
C. Two types of immunoglobulins must combine.
D. The immune system must be fragile and unable to resist attack.

18. There are how many types of allergic reactions?
A. four
B. three
C. two
D. one

19. An example of a Type I allergic reaction would be?
A. serum sickness
B. hemolytic disease
C. anaphylactic reaction-asthma
D. contact dermatitis-poison ivy

20. Characteristics of mucous membranes of those with allergic conditions will appear:
A. clear
B. swollen, pale or cyanotic
C. pink
D. bloody drainage

21. Trigger mechanisms in tissue hyperactivity include:
A. Irritants/metereological factors
B. Psychological/emotional factors
C. Allergy/infection
D. all of the above are trigger mechanisms

22. A serum eosinophil level of ____% is indicative of allergy?
A. above 2%
B. above 4%
C. above 6%
D. above 8%

23. Types of testing to confirm allergy include(s):
A. Scratch test
B. Intradermal skin test
C. Challenge test
D. all of the above can be used to determine allergy

24. Allergic rhinitis may occur
A. seasonally
B. perennially
C. seasonal or perennial
D. only once a year

25. The symptoms of “hay fever” may include:
A. itchy, watery eyes.
B. itchy feet
C. itchy fingers
D. itchy skin

26. Patients with allergic rhinitis who do not receive proper attention may develop:
A. nasal polyps
B. bronchial asthma
C. secondary sinus infections
D. all of the above

27. In perennial rhinitis, animal allergies are caused by which of the following?
A. proteins secreted by oil glands
B. proteins in the saliva
C. proteins in the animal’s urine
D. all are sources of major allergens

28. Newer generations of antihistamines have which characteristics?
A. sedating, multiple side effects
B. available OTC
C. non-sedating, fewer side effects
D. lower in cost

29. Generalized side effects of antihistamines and decongestants to use in client teaching include:
A. drowsiness, nervousness, irritability
B. postural hypotension, palpitations
C. epigastric distress, urinary changes
D. all of the above can be med side effects

30. _______ is the only drug available that can actually prevent allergic reactions from starting.
A. Nasacort
B. Cromolyn Sodium
C. Flonase
D. Saline

31. What is the new FDA approved eye drop for treatment of allergic conjunctivitis that works up to 8 hours?
A. Optivar
B. Visine AC
C. Vasocon A
D. Clear Eyes ACR

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32. Which of the following situations will have a negative effect on a patient with vasomotor rhinitis?
A. pollen
B. cold air
C. dust
D. low humidity

33. The patient with atopic dermatitis (eczema) is sensitive to which elements?
A. irritation, infection
B. heat, scratching
C. secondary infections
D. All of the above

34. Characteristic clinical features of allergic contact dermatitis include:
A. regular, symmetric lesions
B. vesicular, bullous red streak lesions
C. irregular, asymmetric linear lesions
D. irregular, circular patches spread over the body

35. Rhus dermatitis (poison oak, ivy) rash clinically appears:
A. vesicular, bullous red streaks and patches
B. irregular, symmetric linear lesions
C. regular, symmetric lesions
D. irregular, asymmetric raised lesions

36. Acute stages of contact dermatitis may be treated with
A. cool water compresses
B. 1:20 Burow’s solution compresses
C. 1:20 rubbing alcohol compresses
D. 1:20 Epsom salts solution compresses

37. General measures for the management of clothing dermatitis include(s)
A. thorough washing and rinsing to remove detergent
B. airing out items that have been dry cleaned
C. controlling perspiration
D. all of the above

38. The two metals responsible for the most contact dermatitis are:
A. gold and silver
B. copper and stainless steel
C. nickel and chromium
D. platinum and brass

39. Anaphylaxis is a systemic reaction to a foreign material with symptoms that may include
A. generalized pruritus, profuse sweating
B. abdominal pain, N/V, diarrhea
C. dyspnea, cyanosis, chest pain
D. all of the above

40. In respect to patient teaching, what percent chance does a child have of developing allergies if both parents have allergies?
A. 75-80%
B. 55-65%
C. 35-45%
D. 15-25%

41. Which seasonal allergy commonly occurs during the months of August to September?
A. grass pollen
B. ragweed pollen
C. dust, feathers
D. animal dander

42. Allergies and colds have similar symptoms. Which signs will differentiate that it is probably an allergy?
A. you have a fever
B. mucus secretions are thick and colored
C. sneezes occur in rapid, multiple sequence
D. symptoms last 10 or fewer days

43. Causes of allergies, other than inhaled allergens, can include which of the following?
A. food
B. latex/drugs
C. insect stings
D. all are potential allergens to be considered

44. Which form of allergy testing measures the level of IgE in the blood?
A. skin testing
B. intradermal testing
C. radioallergosorbent testing
D. serum complete blood count (CBC)

45. The best way to avoid symptoms of nasal allergy is
A. take your medicine
B. prevention (avoiding exposure)
C. never go outside
D. over expose yourself to build up a tolerance to the allergen

46. Tips to allergy prevention include which of the following?
A. Prohibit smoking indoors
B. Wear a surgical mask or scarf when outside, mowing or dusting
C. Bathe pets regularly
D. All these will help with allergy prevention

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47. Decongestant nasal sprays should not be used for more than how many days?
   A. 3-7 days  
   B. 8-12 days  
   C. 14-21 days  
   D. There is no limitation to using decongestant nasal sprays

48. Immunotherapy (allergy shots) may take how long to begin alleviating symptoms?
   A. one to two months  
   B. three to five months  
   C. six to twelve months  
   D. one year or more

49. Herbal treatment for children with allergies include(s)
   A. Astragalus and Echinacea  
   B. Fenugreek, Thyme and Nettle  
   C. Garlic and Licorice Root  
   D. All are appropriate herbal treatments

50. Which vitamins are helpful during allergy season?
   A. Vitamins D & E  
   B. Vitamins B5 & C  
   C. Vitamins B2 & K  
   D. Vitamins are of no benefit to alleviate allergy symptoms

End of Independent Analysis.