Allergy

Allergy is a condition in which the body reacts with unusual sensitivity to a substance or substances. These substances, which are usually proteins, are called antigens. They stimulate the body to produce a class of antibody termed “IgE,” which weaken or destroy the antigens. In cases, when an antibody reacts with an antigen, the organic compound histamine is released from special body cells called mast cells. It is an excess of histamine that results in allergy symptoms.

A runny nose and watering or itching eyes are common to many persons who suffer each year from hay fever. In asthma, there is wheezing; with eczema and hives there is itching, redness, and lumps. An inflammation of the skin (contact dermatitis) may occur from wearing rubber gloves or touching a certain chemical, such as some kinds of soap. A reaction to antibiotics, particularly penicillin, may take the form of a rash.

This is due partly to hereditary factors; some families seem to be more susceptible to allergies than others, although particular allergies are not necessarily inherited. Emotional disturbances can also set off allergic conditions, and many physicians believe that an emotional factor may be one factor that triggers an asthma attack.

The physician usually gets a detailed history from the patient to find the most likely source of the problem and may then carry out a skin test. A weak solution of the substances that are suspected is injected into the skin. A red reaction indicates an allergy to that particular substance. Sometimes a patch test is done for the same reason.

If the cause of the allergic reaction is not known, a physician may prescribe antihistamine pills or corticosteroid nasal and lung sprays to control the symptoms. Various medications, including theophylline, are used to treat asthma. When the cause of an allergy is known, the patient can undergo desensitization with injections of the allergen known to cause the symptoms. This process is not always successful; it is considered by some to be potentially dangerous.

An allergic reaction to an insect sting or antibiotic drug, such as penicillin, is potentially dangerous and can even be fatal. A mild reaction usually causes a rash. In a violent reaction, which is called anaphylactic shock, the patient finds breathing increasingly difficult. This is an emergency condition, and medical attention should be obtained immediately. Fortunately, the condition is rare.

ALLERGIES 101

A Scientific Look at an Allergic Reaction

You know how you feel congested, itchy, usually on the verge of sneezing. You know what causes it…you have allergies. But have you ever wondered why your allergies cause these symptoms?

For most people, substances such as pollen, animal dander, and dust are harmless. But if you are one of the 40 million to 50 million who suffer from allergies, these ordinary substances are interpreted as a threat by your immune system.

Here’s what happens. When a sensitive individual encounters an allergen, that person’s body reacts to the substance as if it were a threat. In response, the body creates antibodies normally reserved for fighting other danders such as bacteria and viruses. The antibodies stick to the surface of mast cells and basophils (cells that are present in everyone). The next encounter with the allergen leads to an even greater reaction due to the antibodies that signal the mast cells to flood the area with histamine (and other chemicals).

In addition to rhinitis and conjunctivitis, which are manifested by nasal congestion, sneezing and itchy, watery red eyes, you may also develop asthma and skin reactions such as eczema. With each

subsequent exposure to the allergen, allergic reactions can become increasingly severe due to a "snowball" effect.

Although researchers are unsure why some people develop allergies while others do not, there is evidence that a genetic component may be a contributing factor. If a gene that predisposes individuals to allergies could be identified and isolated, a permanent cure might follow.

Congestion and Other Allergy Symptoms

Your nose filters the air you breathe, preventing unwanted substances from traveling into your lungs. When you inhale, the air circulates over, under, and around the inferior, middle, and superior nasal passages. This process filters, moistens, and warms the air. When you inhale an allergen like pollen, it gets filtered out and lodges in the mucus that lines the nasal passages. There, it encounters mast cells, and these cells react to this encounter and release a substance called histamine. The histamine causes blood vessels in the nose to expand and leak fluid into the surrounding tissue. When the fluid seeps into the surrounding tissue, it causes swelling, itching, and inflammation, and you experience symptoms like sneezing and a runny, itchy nose.

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

Allergies can also affect your sinuses—the air-filled cavities lined with mucous membranes in the bones that surround your nose. The four facial sinuses—maxillary, ethmoid, frontal, and sphenoid—are usually responsible for producing protective mucous that drains into the nasal passages.

What Are Your Allergy Triggers?

Did you know that one ragweed plant can produce a billion grains of pollen a day and we can't even see it? In fact, the pollen that most often causes allergy symptoms is light, dry, and spread by the wind, not the yellow pollen that covers your car in the morning. Even people with pollen allergies or seasonal allergic rhinitis mistake the yellow substance produced by garden flowers as the reason for their misery, but the real culprits are microscopic grains of pollen released by trees, grasses, and weeds.

Although the time of the year that each plant pollinates remains relatively constant, the onset of a particular pollen season is largely influenced by geographic location. Environmental factors such as the sun, rain, and wind can also affect the amount of pollen in the air and total pollen production.

Common Allergens:

Trees	Molds
Grasses	Animal Dander
Weeds	Dust Mites

Name _____ **Allergy Article Worksheet**

Answer the following questions about allergies in ***complete sentences***, after reading the articles provided.

1. **Do <u>you</u> have allergies?** If so, which organisms cause you to have an allergic reaction?

Base questions 2 – 6 on the article titled simply, "Allergy."

2. What are the common allergy symptoms?

3. Why are some people allergic to certain substances and others not?

4. How does a physician determine the cause of an allergy?

5. What treatment can be given for an allergic reaction?

6. Are there any dangerous allergic reactions?

Base questions 7 – 10 on the article titled, "Allergies 101."

7. Allergies are interpreted by your body as a threat to which system?

8. Which symptoms result when allergens get into your eyes?

9. Describe how histamine stimulates the immune system. (The result is called a symptom.)

10. Many people often blame large yellow pollen for their allergies; however, yellow pollen are not responsible. Describe the characteristics of pollen that causes allergic reactions in humans.