

The immune system protects you by sending special cells proteins and natural chemicals whenever viruses, bacteria, or other harmful substances invade your body. This response helps neutralize the foreign invaders. There are many substances that enter the body that the immune system views as harmless such as pollen, dust, and animal hair. However, when a person's immune system tries to fight off harmless things in the environment as if it were harmful this is called an Allergy. The substances that cause this reaction is called an allergen. The first time, the immune system reacts by activating special cells. These cells make large amounts of proteins called antibodies that are specific to the type of allergen. These antibodies then attach to other immune cells making them sensitive to the specific allergen. The next time the allergen enters the body these sensitive immune cells quickly attack. They attach to the allergen which causes a release of natural chemicals including histamine. These chemicals enter the surrounding tissue and cause the early symptoms of allergies. An anaphylaxis reaction is the most intense form of an allergic reaction. It is a severe systemic allergic reaction and is the body's reaction to the allergen the person has been sensitized to. The symptoms may be mild, moderate, severe, protracted or biphasic. Once the person is exposed to the antigen, it enters the bloodstream and interacts with IgE antibodies bound to mast cells and basophils. This union of antigen and antibody produces a complex sequence of intracellular biochemical events in a form of a cascade. A signal sent through the IgE antibody to the cell's interior begins the sequential activation of a series of enzymes. This leads to an influx of calcium into the cell and the fusion of granules. The result is degranulation with the release of histamine and other chemical mediators into the extracellular space. The mediators flow through the body and bind to the receptor sites at target organs producing physiological effects such as, beta dilation and increased vascular permeability in the lungs. Histamine produces smooth muscle contraction which causes obstruction, wheezing, and shortness of breath. A combination of mechanisms results in myocardial depression. Epinephrine must be self-administered immediately. Upon injection, Epinephrine works rapidly at the organ's site to counter the effects of the chemical mediators acting to constrict blood vessels, reduces vascular permeability, relaxes smooth muscles of the airway and stimulates the heart rate. Generally, this reverses the most dangerous effects of an anaphylactic reaction allowing time for transport to an emergency center; however, in some cases the continued flow of mediators prolongs the pathophysiological effects or produces a relapse of the anaphylactic state and a single dose of Epinephrine is not enough. If symptoms have not improved within 5 minutes, administer a second dose.