

Types of Food Allergy Testing

by Raymond Shamberger, PhD

Several types of food or metal allergies have been observed in patients. The major ones include Type I, Type II, Type III, and Type IV. Type I testing is done mainly on the skin and detects IgE-antibody food allergies. The IgE antibodies attach to mucous membranes, which release histamine. Allergic reactions may occur within one to 60 minutes. These reactions affect the skin, airway, and digestive tract, causing classical allergies such as rhinitis, urticaria, angioedema, eczema, vomiting, diarrhea, and anaphylaxis. These are more dangerous symptoms, and they can be life-threatening.

Type I is common in children, but rare in adults. Only one or two foods are usually involved in causing allergic symptoms, which occur two hours or less after consumption of offending foods. Usually, the allergic food is eaten infrequently; however, small, even trace, amounts of food can trigger an intense allergic reaction, including anaphylaxis, in which a fatal reaction can occur within minutes. Because the offending food is rarely eaten and can be readily identified and is followed by the immediate appearance of allergic symptoms, this offending food allergy is commonly self-diagnosed, and many patients may never see a physician. In addition to an intense allergic reaction, skin testing may be painful, is not always accurate, and may be inappropriate or difficult for children. The best test for this type is a modified RAST blood test (IgE).

Type II food allergy involves lectin allergens, which bind to ABA markers on cells that include red blood cells, mucous membranes, intestinal lining, and most other cells. This attracts IgG antibodies and killer cells, which will destroy red blood cells, thereby causing anemia. There are about 70 known food lectins, which could attach specifically to A, B, or O blood types. However, most lectins are destroyed by cooking and digestion and therefore rarely cause serious problems. The lectins that attack each of the different blood types have been identified in the scientific literature.

Type III immune reactions are more frequently involved in food allergy than Type I reactions. About 45-60% of the population has been reported as having Type III food allergies. Up to 70-80% of Americans who do not respond well to medical treatment may be suffering from IgG-mediated, delayed-onset food allergies. A Type III food allergy also involves the immune system. This occurs when there is an overabundance of antibody immunoglobulin G (IgG) to a specific food. The IgG antibodies, instead of binding to Mast cells – as do IgE antibodies in Type I allergies – bind directly to the food as it enters the bloodstream, forming different sizes of so-called circulating immune complexes (food allergens bound to antibodies circulating in the bloodstream). These IgG food immune complexes may deposit in certain tissues, elucidating a Type III reaction.

The allergic symptoms in Type III immune reactions may occur two to 24 hours after offending foods are eaten, but symptoms may not appear for 48-72 hours.

Type III testing uses IgG-linked antibodies and a technique called Enzyme-Linked Immuno-Sensitive Antibody (ELISA). The ELISA procedure involves binding of FDA-approved allergenic extracts to polystyrene microtiter plate wells; when serum is added to the wells, food-specified IgG will bind to fixed food allergen. Antihuman IgG-horseradish peroxidase is then added, followed by addition of appropriate substrate. The resulting colored end-product of the enzymatic reaction can be quantified with a spectrophotometer. This type of testing is very accurate and can be done on children, and it allows a substantial number of tests to be done at the same time. Every patient's test results are different. Clinical involvement of three to ten food allergens may be observed.

Sometimes over 20 foods are involved. Having only one or two foods as allergens is rare. Often, large amounts of food in multiple findings may be necessary to produce allergic symptoms. Due to multiple foods and delayed onset of symptoms, the offending foods are rarely self-diagnosed. Multiple visits to doctors' offices, with those visits involving different physicians, are the rule, not the exception, before the correct diagnosis and treatment is provided.

Food Allergy Testing

Many times, allergic foods are favorite foods, frequently eaten in larger amounts. In contrast to Type I allergy, this type of allergy is usually reversible. Symptoms often clear after the patient avoids the offending food for three to six months and substitutes alternate foods in the diet. Differences between Type III and Type I food allergy are summarized in Table 1.

Type IV reactions are involved in many autoimmune and infectious diseases, but may also involve contact dermatitis (e.g., poison ivy). These reactions are mediated by T cells in the skin and soft tissues, monocytes, and macrophages. The macrophages engulf food allergens and transfer these to T-cells. Both cells release cell messengers (interleukins), which stimulate the immune system, causing inflammation and tissue damage, leading to degenerative symptoms. The best test for Type IV allergy is the ELISA/ACT LRA blood test. Another

more recent application involving T-lymphocyte Type IV immunity is the memory lymphocyte immunostimulation assay, also known as MELISA.

Several metals used in medical and dental care, such as nickel, gold, palladium, and mercury, can sensitize genetically predisposed individuals and induce a so-called Type IV allergic reaction. A Type IV allergy is mediated by T-lymphocytes that have had prior contact with the sensitizing allergen. These memory lymphocytes respond by enlarging (lymphoblast transformation) and dividing (proliferation). The newly formed cells (effector cells), together with secreted cytokines, mediate the resulting allergic reaction. During this test, lymphocytes from sensitized individuals are cultured in 48-well tissue culture plates, which are coated with different concentrations of metal salts. The results are compared to the controls.

Stejskal et al.¹ have studied the frequency of metal-induced

lymphocyte responses in 3,162 patients in three European Laboratories using MELISA. Many patients attribute their health problems to amalgam and other dental metals. Mercury and gold may function as haptens in genetically susceptible individuals. The effect of dental metal removal was studied in 111 patients with Chronic Fatigue Syndrome (CHF) and compared to 116 healthy patients. Both groups were studied by inquiries and follow-up MELISA. CHF patients had increased responses to several metals, including inorganic mercury, phenylmercury, and gold. After dental metal removal, 83 patients (76%) reported long-term health improvement. No improvement was seen in 24 patients (22%), and two (2%) were worse. The authors suggest that the metal inflammatory response may affect the hypothalamic-pituitary-adrenal axis and trigger other non-specific symptoms of Chronic Fatigue Syndrome and chronic conditions like myalgic encephalitis and other chemical sensitivities. King James Medical Laboratory has tested patients for metal allergy to about 20 metals in two different profiles. The majority of positive effects were found with mercury and nickel.

Raymond J. Shamberger PhD
Laboratory Director
King James Medical Laboratory
24700 Center Ridge Road
Cleveland, Ohio 44147

1. Stejskal V. Metal-sensitized lymphocytes: biomarkers of sensitivity in man. *Neuroendocrinology Letters*. 1999; 20: 289-298.

Raymond Shamberger, PhD, FACN is Laboratory Director at King James Medical Laboratory, Inc., Cleveland, Ohio. He has published over 200 articles on medical biochemistry and nutrition and disease. ♦

Table 1: Differences Between Type III and Type I Food Allergies

TYPE III DELAYED FOOD ALLERGY (IgG)	TYPE I IMMEDIATE FOOD ALLERGY (IgE)
1. Three to ten or more food allergens may be involved.	1. Only one to two involved in allergic symptoms.
2. Larger amounts of food in multiple feedings may cause allergy.	2. Trace amounts of food may trigger intense allergic reaction.
3. Allergy commonly appears two-24 hours after certain foods are eaten.	3. Allergic symptoms appear two hours or less.
4. Almost any tissue organ or human system may be affected.	4. Primarily affects the skin, airway, and digestive tract.
5. Very common in children and adults.	5. Common in children, rare in adults.
6. Addictive craving and withdrawal symptoms may occur.	6. Addictive cravings, withdrawal symptoms are rare.
7. Due to multiple foods causing allergies and delayed onset of symptoms, the offending foods are rarely self-diagnosed. Multiple physician visits may be needed.	7. Offending food is self-diagnosed due to the immediate appearance of allergic reactions.
8. Allergic foods are frequently favorite eaten foods in larger amounts.	8. Allergic food is food that is rarely eaten.
9. The food allergy may be commonly reversible after three to six months of avoidance.	9. The fixed food allergy is commonly permanent.

Copyright of Townsend Letter for Doctors & Patients is the property of Townsend Letter Group and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.