

FOOD ALLERGY



Introduction

"Food allergies" are often blamed for any adverse reactions before or during the ingestion of a specific food. In reality, only a portion of these cases qualify as true allergic reactions, in which a food containing an allergen actually triggers an immunologic reaction, causing symptoms in the person ingesting the food. In fact, less than 8 percent of children under age 3 and about 4 percent of adults have true food allergies.

More often than not, reactions to specific foods are due to a food intolerance rather than food allergy. Food allergy and food intolerance share many common symptoms. Therefore, careful evaluation of all food-induced reactions can help avoid a misdiagnosis.

Food allergy can be either classified as IgE-mediated (e.g. anaphylaxis due to peanut exposure) or non-IgE-mediated (e.g. Celiac disease due to gluten hypersensitivity, in which cellular and other immunologic reactions cause the disease process).

During a food allergy reaction, the immune system identifies a specific food as a foreign substance. The body then produces allergy antibodies (IgE) to attack the food identified as foreign. The next time the individual ingests even a small amount of that food, these specific IgE antibodies bind to the offending food, triggering an immunologic release of chemical mediators from mast cells and other inflammatory cells, causing the allergic reaction.

Types of food intolerance (non-allergic)

- **Absence of an enzyme needed to fully digest a food.** A common example of this type of food intolerance is *lactase deficiency*, resulting in lactose intolerance.

erance. It can cause bloating, cramping, diarrhea and excess gas following ingestion of dairy products.

- **Irritable bowel syndrome.** This recurrent or chronic condition is often associated with cramping, constipation and diarrhea following meals.
- **Food poisoning.** This adverse reaction to food is commonly caused by consuming bacteria or toxins in spoiled foods (e.g. scombroid poisoning in tuna steaks, and cigatera poisoning in large grouper or red snapper). Symptoms include explosive diarrhea and severe abdominal cramps (symptoms are short-lived and usually not recurrent).
- **Sensitivity to food additives.** Allergy-like reactions can occur after eating certain food additives. For example, sulfites—a preservative common to dried fruit, canned goods and wine—can trigger asthma or anaphylaxis in sensitive people. Monosodium glutamate (MSG) causes flushing and hypotension, otherwise known as "Chinese restaurant syndrome."
- **Recurring stress or psychological factors.** The mere thought of a food or fear of food allergy may make people sick. Psychological triggers may manifest as GI symptoms.
- **Pharmacological reactions to foods or drinks.** Caffeine can cause irritable bowel and GERD. Also, tyramine in cheese can trigger migraine headache, and nausea, while peppermint and certain spices may trigger acid reflux symptoms.

Natural history of food allergy

The overall incidence of food allergy appears to be approximately 4-8% with a higher incidence in young children. IgE-mediated allergic reactions to foods include:

anaphylaxis (35%), worsening of atopic dermatitis in children (37%), urticaria and angioedema (20%), and asthma flares in children (5%). Oral allergy syndrome (when food causes pruritis of the mouth, palette or throat) is fairly common and involves a local allergic reaction to food which is limited to the lips, mouth and throat and is usually *not* life-threatening. GI symptoms due to food allergy are highly variable, and nasal symptoms are rarely a result of food allergy.

Even though food allergy symptoms can be severe in childhood they may be outgrown. Many children with food allergies become tolerant to these foods with the passage of time. This is most likely to occur with allergies to cow's milk, eggs, wheat, and soybeans. It is least likely to occur with peanut, tree-nut, and seafood allergies. Before re-introducing a known food allergen, it's important to repeat allergy testing and/or controlled food challenge to see whether a food allergy has receded, otherwise re-introduction could lead to a serious, life-threatening reaction.

The mechanism of food allergy

Mucosal barrier:

The mucosal barrier in the GI tract prevents harmful proteins (bacteria, viruses, parasites, and food proteins) from being absorbed into the body. Both the gut-associated lymphoid tissue (GALT) and antibodies (S-IgA) play an important role in preventing GI absorption of potentially harmful proteins.

The immature GI tract of an infant is not an efficient barrier, increasing the incidence of GI infections and the development of food allergies during infancy. As the infant matures, the GI tract becomes a more efficient barrier against foreign proteins and the risk of allergic sensitization to food proteins decreases.

Oral tolerance vs. food allergy:

Many soluble food proteins are absorbed through the mucosa without causing allergic symptoms. These intact soluble proteins may not provoke an allergic reaction and instead induce a state of unresponsiveness known as oral tolerance.

Normal immune response to ingested antigens:

Some individuals produce antibodies or cellular responses against ingested food and without associated clinical symptoms. These isolated responses to food antigens are not unusual and often lead to a false positive diagnosis of food allergy when the diagnosis is based solely on laboratory studies. Damage to the GI tract is frequently associated with increased levels of anti-food antibodies not associated with food allergy. Therefore, the presence of food antibodies alone will not absolutely confirm the presence of food allergy.

Common food allergens

1. Cow's milk: Cow's milk is the most common food allergy in young children (both IgE- and non-IgE-mediated). Milk allergy affects 2.5% of children under age 2, with most children developing tolerance to milk by age 5. Cow's milk contains more than 20 protein components. Milk proteins are composed of 80% casein, and 20% non-casein or whey, consisting of beta-lactoglobulin, alpha lactalbumin, bovine immunoglobulin and bovine serum albumins. Pasteurization does not denature these proteins.

Goat's milk proteins are not a safe alternative, as they contain similar allergens to cow's milk protein and may induce an allergic reaction in a sensitive patient. Casein-hydrolysate formulas such as Alimentum, Progestimil and Nutramigen are often recommended for use in infants with milk allergy. These formulas contain proteins that have been extensively broken down so that they are not as likely to cause an allergic reaction. Alternatively, non-milk-based formulas may contain soy, however some infants may also develop soy allergy.



Where milk allergens hide

- Deli meat slicers can contaminate meat with cheese
- Brands of canned tuna fish and other non-dairy products may contain casein, a milk derivative
- Restaurant steaks may be seasoned with butter

2. Chicken egg: Egg whites contain 23 glycoproteins including the major egg allergens ovomucoid, ovalbumin and ovotransferrin. Yolk is much less allergenic. Heated egg products (even baked goods) may be tolerated in small amounts, since their structure and allergenicity are altered by heat.

Where egg allergens hide

- Foam or milk toppings on specialty coffee drinks. Certain cocktails may also contain egg.
- Certain brands of egg substitutes may contain egg
- Most commercially processed cooked pastas (including those used in prepared foods such as soup) contain egg or are processed on equipment shared with egg-containing pastas. Boxed, dry pastas are usually egg-free, but they may be processed on equipment that is also used for egg-containing products. Fresh pasta is sometimes egg-free. Read the label or ask about ingredients before eating pasta.
- Flu vaccines contain a tiny amount of egg. Individuals with egg allergy should undergo allergy skin testing with the vaccine and if necessary be desensitized to the vaccine if the skin test is positive. [American Academy of Pediatrics (AAP) recommends that the MMR vaccine can be safely administered to all patients with egg allergy.]

Food-allergy imposters

Absence of an enzyme needed
to fully digest a food

Irritable bowel syndrome

Food poisoning

Sensitivity to food additives

Recurring stress or
psychological factors

Pharmacological reactions

3. Peanuts: Peanut is the most common food allergen for individuals over age 4. Interestingly, refined peanut oil free of peanut protein allergens is usually safe for peanut-sensitive individuals to ingest.

Although once considered to be a lifelong allergy, recent studies indicate that up to 20 percent of children diagnosed with peanut allergy outgrow it.

Where peanut allergens hide

- Processed tree nuts may contain peanuts. Mandelonas may be peanuts soaked in almond flavoring.
- Arachis oil is peanut oil.
- African, Chinese, Indonesian, Mexican, Thai, and Vietnamese dishes often contain peanuts or are contaminated with peanuts during the preparation process.
- Foods sold in bakeries and ice cream shops are often in contact with peanuts.
- Many brands of sunflower seeds are produced on equipment shared with peanuts
- Most experts recommend that peanut-allergic patients avoid tree nuts as an extra precaution, as contamination or dual sensitivity may be an issue.
- Peanuts can be found in many foods and candies, especially chocolate candy.

4. Soybeans: Soybeans are a major part of processed food products in the United States. Avoiding products made with soybeans can be difficult, and eliminating all those foods can result in an unbalanced diet.

Where soy allergens hide

- Baked goods, canned tuna, cereals, crackers, infant formulas, sauces, and soups
- Restaurant food
- Processed foods
- Hamburger helper, and other food extenders
- Vegetarian meals
- Certain brands of peanut butter

Studies show that most soy-allergic individuals may safely eat refined soybean oil (not cold-pressed, or extruded oil).

5. Tree nut: Tree nut allergens (walnuts, cashews, almonds, pecans, pistachios, and hazelnuts.) cause about 0.6% of allergic reactions to foods. Patients may find that they are allergic to many nuts, not just one. However, most tree nut allergy sufferers can usually tolerate peanuts, and peanut allergy patients often tolerate tree nuts. But since peanuts may be mixed with tree nuts, it is probably best to avoid all of them if you have a known nut allergy. Although tree nuts and peanuts are unrelated, occasionally patients are allergic to both.

Where tree nut allergens hide

- Mortadella (a type of Italian processed meat) may contain pistachios.
- Tree nuts are used in many foods, including barbecue sauce, cereals, crackers, and ice cream.
- Kick sacks, or hacky sacks, and bean bags, are sometimes filled with crushed nut shells. (Inhaling the allergens can occur after kicking the hacky sack.)

Note: The water chestnut is not a nut; it is an edible portion of a plant root known as a "corm." It is safe for someone who is allergic to tree nuts.

Nutmeg is obtained from the seeds of the tropical tree species *Myristica fragrans*. It is also safe for an individual with a tree nut allergy.

6. Fish: Fish allergy is common in children and adults, and consumption of the allergen isn't the only cause of an allergic reaction. Fish allergy is usually a result of ingestion. However, inhalation of allergen can also cause symptoms. These allergic reactions to fish and shellfish can be severe and may result in anaphylaxis.

It should be noted that these potent allergens are not eas-

ily denatured during cooking. Fish proteins can become airborne during the cooking process, (especially boiling), and can induce an allergic reaction in sensitive individuals. There is also risk of cross-contamination in food preparation areas of a non-fish meal from a counter, spatula, cooking oil, fryer, or grill exposed to fish. It's better to stay away from restaurants frequently serving fish and shellfish if you are highly allergic to these foods.

Where fish allergens hide

- Caponata, a traditional sweet-and-sour Sicilian sauce, can contain anchovies
- Caesar salad dressings and steak or Worcestershire sauce often contain anchovies
- Surimi (imitation crabmeat)

Q: Should iodine or iodine-based dyes used in x ray studies be avoided by a fish- or shellfish-allergic individual?

A: Allergy to iodine and/or radiocontrast material (a dye used in certain x-ray procedures), and allergy to fish or shellfish are *not* related. Therefore, fish and shellfish allergy are not a contraindication to the use of radiocontrast media, a common concern among radiologists.

7. Shellfish: Shellfish allergens cause frequent allergic reactions in adults. Shellfish fall into two groups: mollusks (snails, mussels, oyster, clams, squid, and octopus) and crustacea (lobster, crab, shrimp, prawns). Strong cross-reactivity exists between the two groups. Shellfish allergy is common and can be severe, leading to anaphylaxis and angioedema.

8. Wheat allergy and Celiac disease: Wheat allergy (IgE-mediated) and Celiac disease (non-IgE-mediated) are two separate entities

Celiac disease (non-IgE-mediated) or celiac sprue, is a chronic adverse reaction to gluten. Those with Celiac disease will not lose their sensitivity to gluten in wheat. Symptoms include recurrent cramps, bloating, weight loss and bowel problems. Therefore, life-long elimination of gluten is necessary.

The major grains that contain gluten are wheat, rye, oats, and barley. These grains and their byproducts must be strictly avoided by people diagnosed with Celiac disease.

Wheat-allergic individuals have an IgE-mediated response to wheat protein. This allergy is very specific and sensitive individuals must only avoid wheat, and not other gluten-containing foods. Unlike Celiac disease, most wheat-allergic children outgrow the allergy.

Wheat allergy sufferers may present with hives, angioedema, GI symptoms or even anaphylaxis. Wheat can also present an occupational hazard (e.g. baker's asthma), when flour is inhaled.

Where wheat protein allergens hide

- Prepared foods
- Hot dogs
- Certain brands of ice cream

■ **Baker's asthma** The allergen responsible for baker's asthma may be one of the four wheat proteins or an-



other substance, such as a fungus. It's a particular problem for bakers or anyone who works with uncooked wheat flours. The IgE-mediated allergic reaction is triggered by inhaling flour rather than eating it. Chronic, occupational exposure to wheat flour can lead to difficult-to-manage asthma.

Food dependent, exercise-induced asthma and anaphylaxis

Some people with a wheat allergy develop symptoms only if they exercise within a few hours after eating wheat. If you have exercise-related allergy to wheat, you may also experience food-related, exercise-induced anaphylaxis when you consume wheat and take aspirin or certain nonsteroidal anti-inflammatory drugs (NSAIDs) within a few hours.

If you have a wheat allergy, you may also be allergic to other grains with similar proteins. These related grains include barley, oats and rye.

IgE-mediated (allergic) reactions

Allergic reactions can present with systemic symptoms involving the skin, respiratory tract, GI tract and/or cardiovascular system. IgE-mediated food allergy reactions can vary greatly from a mild itchy mouth (oral allergy syndrome) to a severe multi-system reaction such as systemic anaphylaxis (hypotension, wheezing, hives, GI symptoms) resulting in anaphylactic shock.

An IgE-mediated reaction to a specific food is often obvious, since symptoms occur soon after the ingestion of the suspected food and often within minutes of ingestion. In this situation, food allergy sufferers produce specific IgE antibodies directed against



the food provoking symptoms. IgE antibodies specific for food allergens bind to receptors on mast cells and basophils (in the skin, respiratory tract, or GI tract), which bind to food allergens, triggering a release of chemical mediators. These mediators include histamine, leukotrienes, prostaglandins and others that result in a rapid onset of symptoms, usually within minutes, but occasionally delayed by 1-2 hours. Eosinophils, monocytes and lymphocytes are attracted to the released mediators and accumulate at the site of the allergic reaction within the next few hours. The result is a late-phase inflammatory reaction which may prolong the duration of the allergic reaction.

IgE-mediated symptoms

Cutaneous symptoms: Itching, hives and/or angioedema (swelling of the soft tissues) are common. Symptoms resolve when the patient is no longer exposed to the offending food allergen. Foods can also induce a flare of atopic dermatitis in sensitive individuals.

■ **Gastrointestinal symptoms:** Common GI symptoms of IgE-mediated food allergy include nausea, vomiting, abdominal discomfort and pain, cramping and diarrhea. These symptoms can occur alone or in combination with other symptoms.

Persistent GI symptoms may be due to a more chronic, non-IgE-mediated form associated with food allergy called allergic eosinophilic gastroenteritis. This condition results from eosinophilic infiltration of the gastrointestinal tract.

The infiltration rarely involves other organs. Clinical symptoms include abdominal pain, nausea, vomiting, diarrhea, weight loss, blood in the stool, anemia, protein losing enteropathy and/or epigastric tenderness. Diagnosis is confirmed with a GI biopsy revealing the presence of eosinophilic infiltration of the mucosa and submucosa. This condition appears to have a different mechanism than the typical IgE mediated allergy and it is thought that this may be in part a cellular reaction to food allergens.

Placing patients on a simple elemental diet or strict elimination diet results in a significant and often dramatic decrease of symptoms. Corticosteroids are effective in this chronic condition, and in some cases ingested corticosteroids that are designed for inhaled use have been helpful, while minimizing side effects. Symptoms resolve in 6-8 weeks following allergen elimination.

■ **Oral Allergy Syndrome (OAS):** Also called the pollen-food allergy syndrome, often affects pollen-allergy sufferers. Symptoms present with pruritus of the mouth, lips, tongue, palate and throat when patients are exposed to foods that share common antigens with pollen. For example, patients with ragweed sensitivity often have oral symptoms following the ingestion of members of the gourd family (cantaloupe, honey dew, watermelon, cucumbers, zucchini) and banana.

OAS has also been noted with apples, celery, tree nuts, potato, kiwi, peaches, pears, cherries, to-



matoes in patients allergic to tree and grass pollen.

■ Respiratory symptoms:

a. *Oral ingestion of foods causing respiratory symptoms.* Anaphylaxis resulting from food allergy often is associated with shortness of breath, chest tightness or angioedema of the airway. Sneezing and itchy eyes may be noted early in anaphylaxis secondary to food allergy.

b. *Asthma caused by food allergy* can be associated with multiple symptoms including urticaria and GI symptoms. On the other hand, asthma symptoms can be quite severe in patients with both severe food allergies and poorly controlled asthma. Exposure to peanut, tree nut or shell fish in a food allergy sufferer with poorly controlled asthma can result in a fatal outcome. Milk and egg allergens are prominently associated as triggers of asthma in young children.

c. *Inhalation of airborne food allergens* in allergic individuals can cause mild to severe respiratory symptoms. Inhaled allergens that cause such reactions include: shellfish, seeds, soybean, cereal grains, eggs, etc. Symptoms include itchy eyes, nose, sneezing, coughing wheezing, dyspnea, hives and anaphylaxis. Symptoms can be particularly severe in occupations that handle foods such as fish processing or baking.

■ Anaphylaxis

Food-induced anaphylaxis

Food allergens causes 30% of fatal anaphylactic reactions. The most frequent offenders are peanuts, tree nuts, shellfish, sesame seeds, cow's milk and eggs. Symptoms include: hives and generalized itching, oral pharyngeal pruritus, angioedema, stridor, cough dyspnea, wheezing, hypotension or loss of consciousness.

If you're allergic to:

You might also react to:

Birch pollen

- Apples
- Carrots
- Celery
- Hazelnuts
- Peaches
- Pears
- Raw potatoes

Ragweed pollen

- Bananas
- Melons (cantaloupe, honeydew and watermelon)
- Tomatoes

Grasses

- Kiwis
- Tomatoes

Mugwort pollen

- Apples
- Carrots
- Celery
- Kiwi fruit
- Peanuts
- Certain spices (caraway seeds, parsley, coriander, anise seeds, fennel seeds)

Food-related, exercise-induced anaphylaxis

This syndrome is characterized by generalized pruritus, warmth, and skin erythema, which can be associated with hives, hypotension, and laryngeal edema, and wheezing. Eating within 2-6 hours before exercise needs to be strictly avoided in this syndrome.

Non-IgE-mediated reactions

Less frequently encountered adverse reactions to foods are immunologically induced reaction to foods that may be due to non-IgE antibodies or sensitized T-cells or other cells responding to an immunological reaction to an ingested food. Such reactions occur hours or days after ingesting a food and symptoms tend to be localized to the GI tract.

1. Food protein induced enterocolitis syndrome (FPIES)

This condition may occur in formula-fed infants by 4-6 months of age, and is usually due to cow's milk or soy. Symptoms include severe vomiting and diarrhea within hours of eating the offending food antigen. Allergy testing is usually negative. Avoidance is the best treatment.

2. Food-induced colitis

Food-induced colitis, also called *allergic colitis*, usually appears by 6 months of age. Symptoms include loose stools, bloody stools, despite the infant's healthy appearance. Allergy tests are negative. Using casein hydrollysate formulas, and in some cases, amino acid-based formulas, cures symptoms.

3. Celiac disease

This condition results from small intestinal mucosal injury in response to ingestion of gluten-containing grain, especially wheat, rye, and barley. Biopsy reveals a flattening of the mucosa, cellular infiltrate of the lamina propria, and IgA antibodies against the reticulum and smooth muscle endomysium. Lab studies include anti-endomysial Ab (IgA); anti-gliadin antibody (IgA) and anti-transglutaminase antibody (IgA; IgG). Patients complain of abdominal cramps, nausea, bloating, diarrhea, and weight loss.

4. Eosinophilic esophagitis

This is an inflammatory condition in which the inner layers of the esophagus are infiltrated with eosinophils and associated with symptoms of dysphagia (difficulty swallowing), heartburn and chest discomfort. In children, symptoms can also include nausea, vomiting and abdominal pain. Although the cause is unclear, food allergy is suspected in some cases. Allergy testing can help and may indicate the need for a trial on an elimination diet—eliminating the suspected food, dilation of the esophagus, and swallowing fluticasone propionate (Flovent), an inhaled steroid used in asthma treatment. When acid reflux complicates eosinophilic esophagitis, proton pump inhibitors are added to the treatment program.

5. Dermatitis herpetiformis

A cutaneous manifestation of gluten sensitivity, dermatitis herpetiformis usually occurs in children ages 2-7 years. The rash

is an erythematous pruritic rash mostly over the knees, elbows, shoulders, buttock, and scalp. Many of these patients have Celiac disease. Treatment consists of elimination of gluten from the diet.

Practical diagnosis

A. Allergy skin testing: allergy skin tests identify the presence of specific IgE antibodies to food allergens. However, a positive skin test is only considered relevant if it precisely correlates with the onset of symptoms following ingestion of the suspected food, or symptoms resolve when the suspected food is eliminated from the diet. It is important to recognize that a positive food allergy skin test only identifies the presence of specific IgE antibodies directed against the food. It does not make a diagnosis of food allergy without clinical confirmation through history, elimination diet, and when necessary, a food challenge.

B. Allergen-specific IgE blood tests: RAST, ELISA, CAP system™, FEIA, and UniCAP offer an alternative lab testing method to identify the presence of specific IgE antibodies against various food allergens. However, these lab tests for food allergy may be misleading. A false positive can occur, indicating that there is indeed an antibody present against the food allergen, but there is no clinical reaction to the food. These lab tests are valuable only when they correlate with a clinical history of allergy and confirmed by resolution of symptoms following elimination of the suspected food. Unfortunately, patients may be told to avoid a food based on the lab test alone without good clinical confirmation, leading to a restricted diet and an unnecessarily complicated life.

C. Dietary history. A careful dietary history kept by the patient may shed light on the correlation of symptoms and a specific food allergy.

D. Elimination diet. Once there is sufficient objective or historical evidence of a specific food causing allergy symptoms, it is eliminated from the diet. If the food is indeed the cause of the allergy symptoms, then avoidance should diminish them.

E. Open food challenge. An open food challenge involves administering increasing doses of the food in question to a patient in a medically-controlled environment. A medically-controlled environment has properly trained medical personnel, medication and all the necessary equipment to deal with a severe allergic reaction that might occur during the food challenge.

The physician must deem it safe, prudent and medically necessary to administer this test. For example: a patient with a history of allergy to a food when allergy testing is negative, but the patient continues to be concerned about hypersensitivity.

Conversely, a patient with a past history of food allergy may test negative. In this situation, the patient wants to know whether it is safe to re-introduce that food. A negative food challenge indicates that the patient is no longer allergic and the suspected food is safe to administer.

In contrast, a patient may have a false positive challenge because of anxiety or psychological factors. Under these circumstances, a double-blind challenge may be needed to confirm the presence of food allergy.

F. The double-blind, placebo-controlled food challenge is the gold standard in diagnosing food allergy. Foods are selected for testing based on the patient's history and/or allergy tests. The suspected food allergen is put into a series of capsules, along with a placebo in matching capsules. The patient receives two challenges, one with placebo and one with food, each adminis-

tered on a separate occasion.

7. GI studies when food allergy presents with chronic or recurrent GI symptoms. Aside from the patient's history, allergy skin tests, lab studies, and elimination diets, an additional x-rays, and/or GI biopsy may be necessary to make a correct diagnosis of a food allergy or a disease process mimicking a food allergy. A biopsy of the GI mucosa in patients with chronic non-IgE-mediated food reactions are often observed to contain infiltrations of eosinophils, a known atopic marker of allergy.



Living with food allergy

Patient (or parent) education is essential to avoid accidental ingestion of an offending food. More importantly, patients need to learn to read all food labels. Educational material is available through the food allergy and anaphylaxis network (www.foodallergy.org) Infants with multiple food allergies may require special formulas based on hydrolyzed casein (Progestimil, Nutramigen, or Alimentum), or mixtures of single amino acids (Neocate or Elecare).

Keeping a food diary can help establish a correlation between the patient's symptoms and food ingested over a period of time.

Elimination diets are usually carried out over a 2-week period. For delayed reactions or persistent GI symptoms, elimination diets may need to be extended for up to 12 weeks.

The use of oral cromolyn sodium (Gastrocrom, 200mg qid) has been effective in helping some patients with food allergy. This medication works by blocking mast cell mediator release and is popular in Europe.

Children or adults at risk for food allergy-induced anaphylaxis should have an EpiPen™ or Twinject™ immediately available and be fully trained in its use. Following a severe anaphylactic reaction, patients should be continually observed by a physician for at least 4-6 hours due to the possibility of a biphasic anaphylactic reaction where the second episode follows the first event after a temporary improvement.

Food allergy treatment

1. Avoidance

Avoiding a known food allergen is the best method of preventing food allergy. Unfortunately, exposure to food allergens can occur even when a food allergy sufferer is extremely careful. Food allergy exposure can be unexpected as with allergen contamination in cooking or processing or because of respiratory exposure.

2. Reaction management

Medications

- EpiPen™ or Twinject™ will allow a patient to self inject a pre measured dose of epinephrine for treatment of a severe allergic reaction such as anaphylaxis or angioedema affecting the airway. Patients with a history of severe food allergy should carry one of these devices at all times.

- Antihistamines often help control symptoms of hives, angioedema, pruritis, sneezing, and itchy eyes
- Corticosteroids work best for angioedema and asthma.
- Rescue (Ibuprofen) inhaler, for food induced asthma symptoms may offer a quick temporary benefit.
- Gastrocrom has had success in prevention of GI symptoms in some patients.

3. Desensitization

Recent studies have found that oral desensitization with peanut allergen has been effective in reducing the symptoms of peanut allergy. Beginning with a tiny amount of peanut allergen, the dose is gradually increased until tolerance has been induced. Although this has proven successful in limited clinical trials, it is not currently an approved approach.

4. Anti-IgE treatment

Over the past few years, researchers have met with some success in preventing peanut anaphylaxis by injecting study subjects with anti-IgE antibodies directed against peanut-specific IgE. This treatment will likely be a lifelong treatment and at least initially be quite expensive. *Currently, this is not an FDA-approved treatment for food allergy.*

Xolair is a non-specific anti IgE antibody that removes circulating IgE. This treatment is currently approved for use in allergic asthma and has proven to be quite effective in controlling asthma and respiratory allergy symptoms. Although this medication is not approved for the treatment of IgE mediated food allergy, patients with severe, multiple food allergies that are IgE-mediated and associated with recurrent, life-threatening episodes food allergy-induced anaphylaxis might be candidates for off-label use of this medication.

Prevention / avoidance tips

Breastfeeding. Experts recommend breast-feeding for at least the first four to six months of life to reduce the infant's chance of developing a milk allergy, allowing the infant gut to mature. Physicians recommend eliminating cow's milk or other known food allergens from the mother's diet while nursing if you have a strong family history of food allergy.

Always read labels on processed foods to make sure they don't contain any ingredient you're allergic to, as ingredients can change.

When in doubt, say no thanks. Many people don't understand that a tiny amount of a food can cause a potentially life-threatening reaction in some people. If you have any suspicion at all that a food may contain something you're allergic to, or you don't have enough information to decide, steer clear unless your allergist deems it safe to consume.

Involve caregivers. If your child has a food allergy, make certain that babysitters, teachers and relatives understand how important it is for your child to avoid the allergy-causing food and that they know what to do in an emergency.



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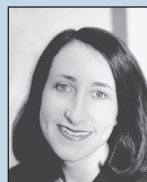
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