

# FOOD ALLERGY AND INTOLERANCE

## Patient Information Fact Sheet

### What is the difference between a food allergy and food intolerance?

Food intolerance is the general term used to describe a range of adverse responses to food, including allergic reactions, adverse reactions resulting from enzyme deficiencies, pharmacological reactions, and other nondefined responses. An allergic reaction to a food can be described as an inappropriate reaction by the body's immune system to the ingestion of a food.

Allergic reactions to foods vary in severity and can be potentially fatal. Any food has the potential to cause an adverse reaction. Foods that commonly induce adverse reactions include milk, gluten containing cereals, nuts, peanuts, eggs, and shellfish.

Most people can eat a very wide range of foods without any problems although they may have likes or dislikes that influence what they choose. However, some people react badly to certain everyday foods and eating them may cause uncomfortable symptoms or, in rare cases, a severe illness. But most unpleasant reactions are not true allergies. Food intolerances may cause uncomfortable symptoms but only true allergies involve the immune system. It is important that people who think they suffer from a food intolerance do not change their diet dramatically so that it becomes unbalanced. They should take advice from a dietitian or doctor to be sure that they really do have a problem and take care to ensure that their diet contains a wide variety of foods to provide all the nutrients normally provided by the foods they cannot eat.

### What is food intolerance?

Food intolerance is the general term used to describe a range of adverse responses to food, including allergic reactions (eg, peanut allergy or celiac disease), adverse reactions resulting from enzyme deficiencies (eg, lactose intolerance or hereditary fructose intolerance), pharmacological reactions (eg, caffeine sensitivity), and other nondefined responses. Food intolerance does not include food poisoning from bacteria and viruses, molds, chemicals, toxins and irritants in foods, nor does it include food aversion (dislike and subsequent avoidance of various foods). Food intolerance reactions are usually reproducible adverse responses to a specific food or food ingredient, which can occur whether or not the person realizes they have eaten the food.

### What is a food allergy?

An allergic reaction to a food can be described as an inappropriate reaction by the body's immune system to the ingestion of a food that in the majority of people causes no adverse effects. Allergic reactions to foods vary in severity and can be potentially fatal. In a food allergy, the immune system does not recognize the food's protein component to which the



individual is sensitive (such as some peanut proteins) as something safe. This component is termed the allergen. The immune system then typically produces immunoglobulin E (IgE) antibodies to the allergen, which trigger other cells to release substances that cause inflammation.

Allergic reactions are usually localized to a particular part of the body and symptoms may include asthma, eczema, flushing, and swelling of tissues (eg, the lips) or difficulty in breathing. A severe reaction may result in anaphylaxis (as with severe peanut allergy) in which there is a rapid fall in blood pressure and severe shock. Food allergy is relatively rare, affecting an estimated 1–2% of children and less than 1% of adults, and is often wrongly used as a general term for adverse reactions to food.

### **Are there different types of allergies?**

There are two well-defined mechanisms via which allergic reactions to food (ie, reactions that involve the immune system) can occur. Most cases of food allergy involve the production of antibodies known as immunoglobulin E (IgE) and are known as IgE-mediated allergies. Symptoms develop quickly and can vary in severity, but the most severe form of this type of reaction is anaphylactic shock.

The other recognized mechanism is a delayed response (taking hours or even days to develop), which involves a different immune system component: the T-lymphocytes (T cells). The best defined example of this type of reaction is celiac disease (sensitivity to the protein, gluten, found in wheat and other cereals). However, delayed reactions can also on occasion occur in response to a range of other foods, including milk and soy.

### **Why don't all people develop allergies?**

Under normal circumstances, a baby rapidly becomes tolerant (nonresponsive) to the many proteins that he or she encounters in the early days and months of life. This process is known as the development of tolerance. The mechanisms that support this process are not fully understood. It is also unclear why most childhood allergies disappear after 12–24 months (eg, milk allergy) while others are present for life (eg, peanut allergy). Another aspect that is poorly understood is the relative importance of diet in the development of allergic diseases. Although, it is recognized that diet can aggravate existing conditions such as asthma and atopic dermatitis, many other factors may also be involved. Similarly, the benefit of dietary restriction in the treatment for these conditions is uncertain, particularly among adults. This is partly because it is very difficult to totally exclude a food or ingredient.

### **How common is food allergy and food intolerance?**

In general, food allergy and food intolerance are more common in children than in adults. It is estimated that true food intolerance affects no more than 5–8% of children and less than 1–2% of adults. This is much lower than the 20% of people who perceive themselves to have an intolerance or an allergy to food. Food allergy, which specifically involves an

adverse response of the immune system (see above), is estimated to affect 1–2% of children and less than 1% of adults (typically 0.3–0.5% depending on the group studied).

### **What are the different symptoms of food allergy and other forms of food intolerance?**

Food intolerance reactions vary considerably in the severity of the associated symptoms and the length of time for which they persist. For example, peanut allergy is often a life-long affliction and can cause severe, even life-threatening, anaphylactic reactions to tiny amounts of peanut protein. Cows' milk intolerance may be severe in early life, but typically disappears as the child grows older. The majority (about 90%) have outgrown the intolerance by the time they go to school (typically by the age of 3 years). Similarly, egg intolerance is usually a temporary phenomenon associated with early childhood.

Celiac disease (gluten sensitivity) is normally life-long and requires adherence to a diet that excludes all gluten, but in some cases the disease is mild and goes undiagnosed as the individual is not aware of any symptoms.

Lactose intolerance results in abdominal symptoms such as bloating and diarrhea in response to test doses of lactose. It is a condition seen in older children and adults. (See below)

### **What causes lactose intolerance and how common is it?**

Lactose intolerance occurs in individuals who lack or have low levels of the enzyme lactase, which is needed to digest the sugar lactose (found in milk) to its constituent sugars (glucose and galactose) in readiness for absorption in the small intestine. In the absence of lactase, undigested lactose passes into the large intestine, causing the characteristic symptoms of diarrhea, gas, and general discomfort. In about 70% of the world's population, a reduction in lactase production after early childhood is the norm. When milk is consumed, symptoms are typically experienced to varying degrees in people of Asian, African, Jewish and Hispanic descent. Nevertheless, the majority of affected individuals can still tolerate moderate amounts of dairy products (eg, a glass of milk), particularly if these are consumed as part of a meal.

The severity of symptoms varies between individuals and most people with this condition can consume moderate amounts of milk and milk products, particularly with meals; complete avoidance of milk and milk products is rarely necessary as most people still produce some lactase enzyme. Yogurt is usually better tolerated than ordinary milk. This is due in part to the fact that an enzyme very similar to human lactase is present in the bacteria used in the manufacture of yogurt (the bacterial culture), although other factors are likely to be of relevance too. Hard cheeses such as cheddar contain only trace amounts of lactose and so are well tolerated. Having milk as part of a meal is also more likely to be tolerated and most people can consume 6 or 7 fl oz without adverse effects, and so can benefit from the nutrients, particularly calcium, provided by these foods.



For people who are very sensitive, lactose-reduced milks are now widely available. Although it is not possible to induce the enzyme once levels have fallen, there is some limited evidence that it is possible to develop a tolerance to lactose by gradually modifying the profile of bacteria that reside in the large bowel in favor of ones that cope with the lactose without causing symptoms.

### **How common is celiac disease (gluten sensitivity)?**

The prevalence of clinically proven celiac disease is estimated at one case per 300 people. Recent advances in the methods for diagnosing gluten sensitivity, based on blood measurements rather than an intestinal biopsy, have enabled screening of the general population and have helped identify previously unrecognized cases.

Celiac disease is usually a life-long condition requiring a life-long and strict gluten-free diet. The main organ affected is the small intestine. Ingestion of gluten activates immune cells in the small intestine, which trigger inflammation and local damage. This disrupts the normal processes used to digest and absorb foods. As a result, untreated celiac patients lose weight, develop deficiency syndromes such as anemia, and experience symptoms such as diarrhea. Gluten is found in wheat, barley, and rye, which means that many dietary staples such as bread, many breakfast cereals and foods such as pizza and pasta can no longer be eaten. Oats were thought to trigger reactions, though this is looking less and less likely.

### **Which foods are the most common causes of allergic reactions and food intolerance?**

The majority of allergic reactions to dietary components are caused by a small number of foods, namely cows' milk, chicken eggs, peanuts, tree nuts, soya beans and soya products, fish, shellfish and gluten-containing cereals. Citrus fruits can also be a cause. In children it has been estimated that nine out of 10 reactions are in response to milk, eggs, soy, peanuts, tree nuts or wheat gluten. Many of these reactions are outgrown in early childhood. The majority of allergic reactions in adults result from sensitization to shellfish, fish, peanuts, and tree nuts. It is unusual for food allergy to begin in adulthood.

### **How common is peanut allergy?**

As peanut allergy is one of the few allergies that is typically life-long; its prevalence is estimated to be greater in adults (0.5–1.0% of the population) than in children (0.5%). It remains unclear whether sensitization to peanuts can occur prior to birth. All people who are known to be sensitive to peanuts should carry preloaded an epinephrine syringe (Epipen) and (with the exception of very young children) be trained in its use. Those caring for children at risk of anaphylaxis, including schools, must be trained in the use of epinephrine and have access to supplies. Even a slight delay in the administration of epinephrine can be fatal.

### **Is migraine caused by food allergy?**

It is likely that some of the headaches and migraines experienced by some people are provoked by food. However, there is unlikely to be a single food that is a common cause. Various mechanisms may be involved, but allergy is not a likely candidate. Coffee, chocolate, and alcoholic drinks are possible triggers for some people, but will be without effect in others.

### **What should consumers look for on labels?**

By law, the majority of packaged food products have to carry a full list of the ingredients they contain, in descending order of weight in the final product. Manufacturers are increasingly deciding, voluntarily, to include information on the presence of small quantities of allergens associated with severe reactions, even when it is not required by law. This information can help consumers identify whether or not a food contains an ingredient that they need to avoid. In addition, where there is a demonstrable risk that traces of an allergen, such as nut protein, may be present as a result of cross-contamination during manufacture, this is generally highlighted at the end of the ingredients list.

### **Further information**

National Institutes of Health: <http://www.nlm.nih.gov/medlineplus/foodallergy.html>

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