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Food allergy in adults

Background

There is a marked increase in the prevalence of food allergies. Food allergy can cause fatal anaphylaxis and the victims are most often adolescents and young adults.

Objective

This article focuses on IgE mediated food allergy and provides a review of the diagnostic and management strategies for food allergy, including a treatment algorithm for anaphylaxis. The role of the general practitioner in food allergy, when to refer to an allergist, and how to support patients with food allergies long term, including survival tips for patients with food allergy, are also discussed.

Discussion

The key management of food allergy is allergen avoidance informed by accurate allergy diagnosis. Inadvertent exposure to food triggers unfortunately does occur and patients need to be confident in prompt self management. Adrenaline must be given for all potentially life threatening food allergy reactions. Anaphylaxis action plans and optimal asthma control are also critical management objectives.

■ **International and Australian reports indicate a marked increase in the prevalence of food allergies.¹⁻⁷ The occurrence of several well publicised tragic events has also heightened community awareness. Consequently more patients are likely to present to their general practitioner with suspected food allergy. The role of the GP in caring for patients with suspected food allergy, and how both GPs and patients can minimise and safely manage the risks associated with food allergy, is discussed in *Table 1*.**

When a GP is faced with a patient with a possible food allergy, there are several questions that need to be addressed:

- are the food related symptoms likely to indicate significant food allergy
- what is the management of food allergy and when is specialist referral indicated, and
- how can patients with food allergy be supported in the long term?

Given that food related symptoms are so common, it is important to recognise that not all food related symptoms (or 'food hypersensitivity') are due to food allergy. The spectrum of conditions leading to food related symptoms is outlined in *Table 2*. True food allergy has an underlying immunological basis, usually mediated by IgE. This review will focus on IgE mediated food allergy as it is this type of food allergy most commonly associated with severe reactions, including anaphylaxis and, in extreme cases, death.

Recognising food induced symptoms

Up to 20% of people complain of food related symptoms, but the prevalence of true food allergy has recently been estimated as 1–3%, with a higher prevalence in children.² The pattern of food allergies changes throughout life, so that egg and milk allergies are common in very young children but are frequently outgrown. In contrast, peanut, tree nut and shellfish allergy tend to develop a little later and are more likely to persist throughout life.² Food anaphylaxis represents 30% of all fatal anaphylaxis⁸ and 17% of anaphylaxis presentations to hospital emergency departments.⁹ Allergies to peanut and tree nuts appear to cause the majority of fatalities from food anaphylaxis. Other contributors are milk, fish and seafood.¹⁰



Are the symptoms likely to be food allergy?

The role of good history taking is paramount in diagnosing a suspected food allergy. The history can help distinguish food allergy from other food hypersensitivities based on the specific symptoms and timing of reactions, and can also help identify a possible food culprit. Symptoms likely attributable to an IgE mediated food allergy are outlined in *Table 3*. The major characteristics of the reaction are its immediacy on exposure to the causative food, almost always within 2 hours, and the occurrence of local oral symptoms in many instances. Respiratory difficulties may be caused by upper airway obstruction (angioedema) or asthma. Cardiovascular compromise may lead to hypotension manifesting as fainting or loss of consciousness. Additional symptoms include rashes such as urticaria and gastrointestinal symptoms such as nausea and vomiting.

The reproducibility of the symptoms associated with the suspect food and whether this food is considered a common food allergen, such as nuts, can help support the diagnosis of a food allergy. When a culprit food does not emerge from a likely history of anaphylaxis, a detailed, minute by minute history can often elucidate the likely agent, as can comparing sequential allergic events. Physical examination during an acute episode can complement the clinical history by evaluating for stigmata such as urticaria and angioedema.

The presence of systemic symptoms and signs related to either the cardiovascular or respiratory systems indicate a potential life threatening reaction. Such reactions are likely to be IgE-mediated and accurate confirmation of the diagnosis is central to ongoing management. Abdominal pain, nausea and vomiting have also been associated with hypotensive anaphylaxis.¹¹

Confirming the diagnosis

Confirmation of the diagnosis requires identification of allergen specific IgE in the patient to the likely food allergen. Tests to identify allergen specific IgE include skin prick testing and blood tests to detect serum specific IgE (commonly called radio-allergosorbent testing [RAST] or CAP testing).

Blood specific testing is widely available and carries almost no risk of side effects. By contrast, skin prick testing to likely anaphylactic food allergens should only be performed by an allergy specialist, with resuscitation equipment at hand. These tests must be interpreted in conjunction with the clinical history as skin prick testing and serum specific IgE testing are not 100% sensitive or specific. While blood specific IgE testing can be performed to a 'mix' of allergens, this is not recommended as testing of allergen 'mixes' may have a reduced sensitivity compared to specific RAST assays.¹²

If doubt remains after a careful history and allergen specific IgE testing, the allergist may arrange for an oral food challenge. This is performed in a tertiary centre with appropriate resuscitation facilities available, and is beyond the provenance of the GP.

Table 1. The role of the GP in food allergy

- Assess the severity and likely risk of food related symptoms, identifying symptoms of likely IgE mediated food allergy and anaphylaxis
- Identify the likely allergen from history and blood specific IgE testing
- Specialist referral when symptoms are severe, if the diagnosis is uncertain, if there is concurrent asthma, nut allergy or in adolescents
- Support and educate the patient and family in ongoing management of food allergies, including allergen avoidance, management plans and adrenaline use
- Optimise asthma management
- Maintain a current anaphylaxis management plan
- Appropriately manage acute food reactions

Table 2. Spectrum of food hypersensitivity disorders

Food allergy

- IgE mediated food allergy (eg. oral allergy syndrome, urticaria, angioedema, anaphylaxis)
- Mixed IgE and cell mediated food allergy (eg. allergic eosinophilic oesophagitis, asthma, atopic dermatitis)
- Cell mediated food allergy (eg. food protein induced enteropathy syndromes, coeliac disease, contact dermatitis)

Nonallergic food hypersensitivities

- Gastrointestinal disorders (eg. structural abnormalities, reflux, peptic ulcer disease, pancreatic insufficiency)
- Toxic reactions (eg. contamination/infection/toxins)
- Intolerances (eg. pharmacologic agents such as caffeine)
- Neurological reactions (eg. auriculotemporal syndrome)
- Psychological reactions (eg. food phobias, food aversions)
- Accidental contaminations (eg. pesticides, antibiotics [if allergy present])

Once a specific food allergen is confirmed, a management plan can be constructed. Identification of the food allergens is critical as it is important not to burden patients with unnecessarily restrictive diets in their ongoing management, but to inform accurate avoidance of food triggers.

Measurements of serum mast cell tryptase collected 1–3 hours after anaphylaxis onset can help confirm the diagnosis of anaphylaxis, noting that tryptase levels are not always elevated during food anaphylaxis. Total serum IgE levels and eosinophil measurements may be helpful if exploring other differential diagnoses. There is currently no role for sublingual food challenges, cytotoxic tests, kinesiology and electrodermal testing and these should be discouraged.¹² Patch testing is being explored in the diagnosis of non-IgE mediated food allergy.⁴



Table 3. IgE mediated vs. non-IgE mediated food allergy

	IgE mediated food allergy	Non-IgE mediated food allergy
Typical symptoms	<ul style="list-style-type: none"> • Oral: tingling of lips, odd taste in mouth, 'lump in the throat', swelling of lips or face • Respiratory: hoarse voice, throat tightness, asthma* • Cardiovascular: syncope, lightheadedness* • Cutaneous: flushing, urticaria, pruritus • Gastrointestinal: nausea, abdominal cramps, vomiting, diarrhoea 	<ul style="list-style-type: none"> • Usually isolated to gastrointestinal symptoms (nausea, vomiting, diarrhoea, abdominal cramps)
Timing after oral intake	<ul style="list-style-type: none"> • Usually seconds to minutes (usually within 2 hours) 	<ul style="list-style-type: none"> • Usually hours to days
Severity	<ul style="list-style-type: none"> • May proceed to anaphylaxis 	<ul style="list-style-type: none"> • Variable, life threatening is extremely rare
Pathogenesis	<ul style="list-style-type: none"> • Type 1 hypersensitivity (IgE mediated) 	<ul style="list-style-type: none"> • Type 3 or 4 hypersensitivity
Examples	<ul style="list-style-type: none"> • Peanut, tree nuts, seafood, milk 	<ul style="list-style-type: none"> • Coeliac disease

* The presence of respiratory or cardiovascular symptoms indicate a life threatening reaction indicative of anaphylaxis

How to manage food allergy

Managing a patient with food allergy consists of two important principles:

- making the patient safe by providing an anaphylaxis plan and educating in its use, and
- accurately identifying the likely food allergen and educating the patient in allergen avoidance.

Making the patient safe

Acute management of reactions

The mainstay of treatment during an acute life threatening allergic reaction is prompt administration of intramuscular adrenaline. In minor reactions with no life threatening features, antihistamines may be used as a first step. These treatments should be administered in accordance with a written anaphylaxis plan, and GPs play a major role in ensuring these are current. All patients who receive intramuscular adrenaline should immediately be referred to the closest hospital emergency department as some patients may experience prolonged or rebound anaphylaxis requiring further emergency treatment (*Figure 1*). It must be explained to patients that carrying self injectable adrenaline is no substitute for vigilant allergen avoidance as treatment of anaphylaxis is complex and may require more aggressive emergency management.

Long term management

The best form of treatment is to prevent inadvertent exposures to allergen. Approximately 90% of fatalities due to anaphylaxis from food had a prior reaction to that culprit food, often less severe, confirming the importance of avoidance to known food allergens.^{10,13}

Severe allergic reactions can occur in response to trace amounts of allergen exposure and GPs play a central role in encouraging patients and their families to undertake strict allergen avoidance.

Unfortunately, even with careful attention to allergen avoidance approximately 14% of children will have an inadvertent exposure to their food allergen within 1 year.¹⁴ These statistics emphasise the difficulties of avoiding ubiquitous foods such as peanut and highlight the importance of experienced dietician advice in planning food consumption in allergic individuals. Inadvertent exposures are likely to be much greater in young adults and adolescents as only 64% always read food labels and more than 50% knowingly eat at least a tiny amount of food containing an allergen.¹⁵ Hence, all patients must have an anaphylaxis management plan and be confident in its use.¹⁴ In this regard education and ongoing medical review are essential to optimal medical management. Written anaphylaxis management plans are available on the internet, a good example being the one prepared by the Australasian Society of Clinical Immunology and

Allergy (see *Resources*) and every patient with severe food allergy should have one. It must be noted that having an anaphylaxis plan is no substitute for strict allergen avoidance.

Disappointingly, 70–85% of fatal food anaphylactic reactions are not treated with adrenaline in a timely manner^{10,13,16} and only 61% of patients suffering severe food allergy carry self injectable adrenaline at all times.¹⁵ Poor patient and community education and patients' attitudes to food allergy are significant contributing factors. While food anaphylaxis can occur anywhere, eating out in restaurants, cafés, bars and the homes of friends are most commonly implicated in inadvertent allergen exposure (*Figure 2*).^{10,13}

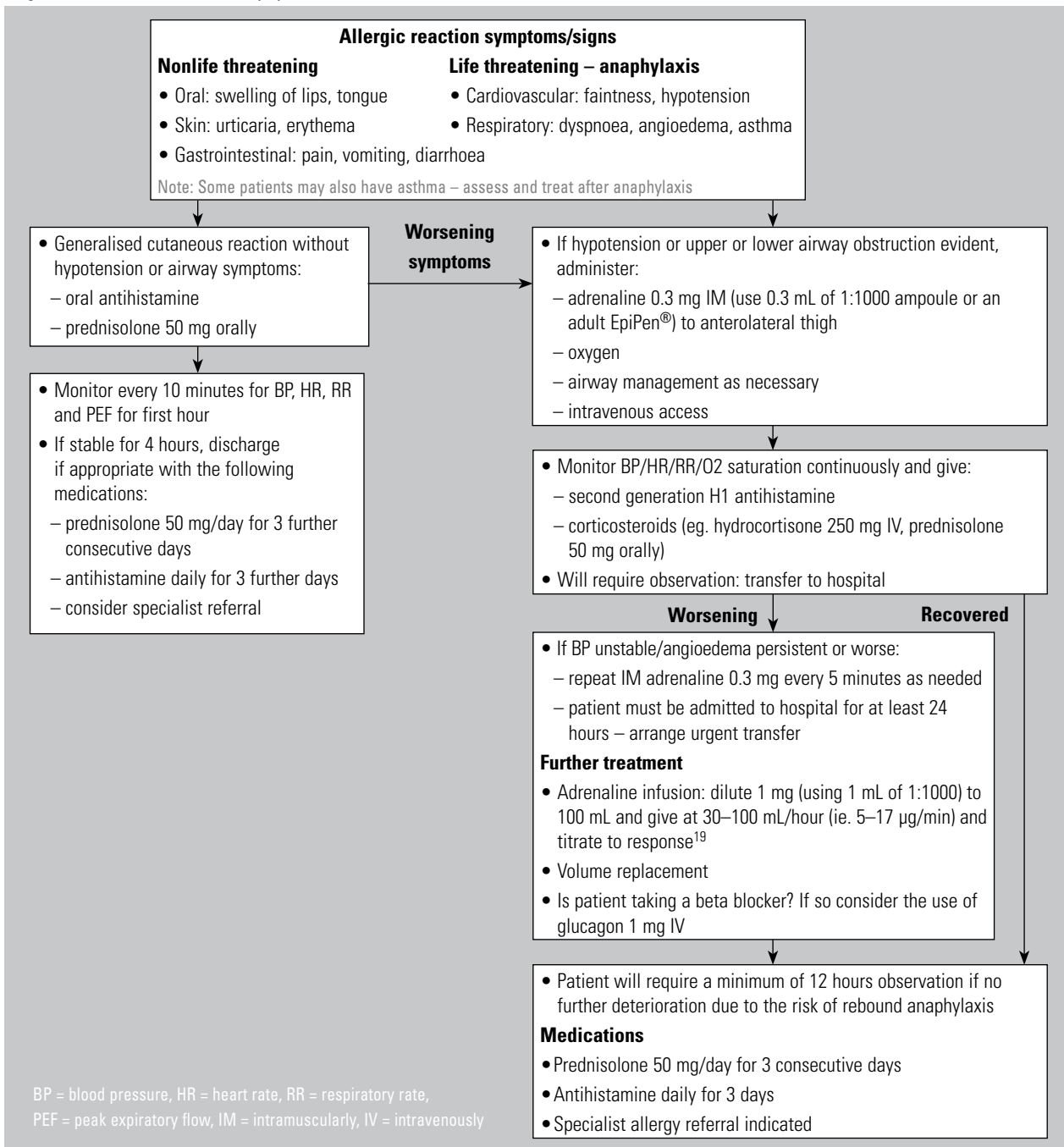
The majority of fatal food anaphylaxis occurs in adolescents and young adults, most likely due to a combination of increased risk taking behaviour, increasing desire for independence, peer pressure, less parental supervision and poor appreciation of the danger. Indeed, adolescents and young adults have their own perceptions of high risk situations and seem to take 'educated risks'. This can have fatal consequences.¹⁵ Sadly, in one study, 62% of food allergic patients admitted to having been teased about their allergy.¹⁵

Risk factors for fatal food anaphylaxis include peanut or tree nut allergy, being an adolescent or young adult, and having asthma. In fact, the vast majority of fatalities from food anaphylaxis (75–98%) occur in asthmatics, which suggests that optimal asthma control is another important management aim.^{8,10,13,16}

As eating away from home appears to be a major risk factor for the occurrence of anaphylaxis, steps should be taken to minimise the risk in these situations (*Table 4*). In particular, when eating in a strange environment a useful additional precaution is to 'touch test'



Figure 1. Treatment for acute anaphylaxis



a tiny portion of food believed to contain no allergen on the lip before eating. A sensation of burning or tingling will alert the patient to the presence of allergen, warning the patient not to proceed.¹⁵ While 'touch testing' may alert patients to danger foods, the sensitivity of this test has not been established and false negatives will occur. Hence, vigilance must be maintained.

When to refer

All patients with life threatening allergic features attributed to food exposure should be referred for specialist allergy assessment.

This will include the careful evaluation of allergic triggers and the provision and initial education in management, including a written anaphylaxis plan and education in dietary avoidance. Other patients that should be referred include patients with concurrent asthma, patients with nut allergy and adolescent patients. Many specialist allergy clinics have access to a dietician skilled in allergy which can be integral to helping patients avoid food triggers, especially with ubiquitous and occult allergens such as peanuts, eggs, dairy, soy or wheat. Specialist allergy nurses can also play a supportive and educational role for patients with food allergies.¹⁷



Unfortunately, at present there is no safe and effective allergen specific immunotherapy for any of the food allergies, although research is very active, particularly for peanut.¹⁸

Figure 2. Location of fatal food anaphylaxis

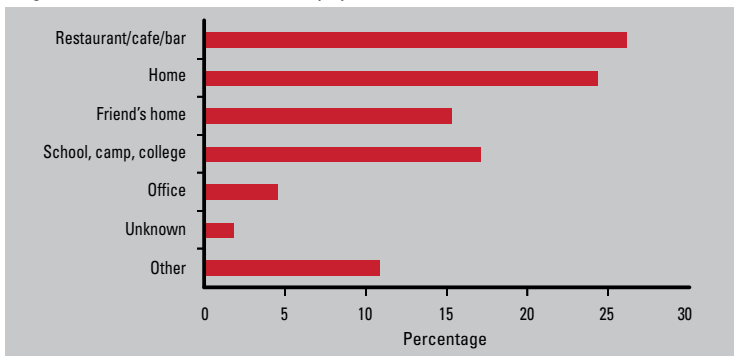


Table 4. Survival tips for people with food allergy

- Know your allergy triggers
- Be educated in careful dietary avoidance
- Have excellent asthma control
- Have a written anaphylaxis plan
- Carry injectable adrenaline at all times and be confident in its use
- Get a 'buddy': make sure a friend or relative knows what to do in the event of a reaction
- When eating out, telephone ahead to notify friends or restaurants of your allergy
- When eating 'allergen free' food you haven't prepared yourself: 'touch test' on the lip before eating
- Recognise that food allergy is a life long condition and ongoing medical support and education is needed

Conclusion

Food allergy is a life long condition and current treatments require patients to undertake vigilant avoidance of causative foods together with an active management plan to treat inadvertent exposures. General practitioners are key in identifying patients with food allergy and in providing ongoing advice and assistance to those diagnosed. The provision of an anaphylaxis management plan facilitates safe self management and encourages patients to live full and active lives despite this condition.

Summary of important points

- The prevalence of food allergy is approximately 1–3%.
- Food induced anaphylaxis represents 30% of all fatal anaphylaxis, the major allergens being peanut and tree nuts. Other causes include milk, fish and seafood.
- In adults, food allergy causing anaphylaxis is likely to be a life long condition.
- The clinical history is fundamental in the diagnosis of food allergy.

- Specialist referral to an allergist is indicated in all severe food allergy, if the diagnosis is uncertain, if there is concurrent asthma, nut allergy or in adolescents.
- Allergen avoidance is the basis of food allergy management.
- To help achieve allergen avoidance, patients must remain vigilant, call ahead when eating out and should 'touch test' all food that is thought to contain no allergen but is not personally prepared by the patient.
- Inadvertent exposure to food allergens must be managed promptly. Adrenaline (often in the form of self injectable adrenaline or EpiPen®) must be given immediately to all potentially life threatening food allergy reactions.
- Having a current anaphylaxis action plan and optimal asthma control are critical management strategies.

Resource

Australasian Society of Clinical Immunology and Allergy: www.allergy.org.au.

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