

Food allergy management

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ABSTRACT

Optimal management of food allergy is complex and multifaceted. Management of food allergy includes ensuring proper diagnosis, monitoring for the emergence of natural tolerance, screening for nutritional and psychosocial issues, and educating the patient and family on living with food allergies across childhood. Education must encompass successfully avoiding the trigger food, recognizing and treating allergic reactions, and navigating living with food allergies. Allergists can help families prepare for specific situations, such as working with daycares, schools, after-school activities and camps, traveling, and dining out. In addition, psychosocial issues such as anxiety and bullying should be addressed, and counseling with regard to emerging therapies discussed. Managing children with food allergies requires continual follow up with regard to these issues, and the needs of families will change over time. Allergists can guide the family as the child grows and transitions to adulthood when managing food allergy.

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After the diagnosis of a specific food allergy, care of the patient shifts to the management of the disease. The goals of management include clarifying the allergy diagnosis (from intolerance, adverse effect, or sensitization), reducing the risk of developing new food allergies, optimizing nutrition, and providing support for living with the disease. Critical to these goals, the proper education of the patient and family about the patient's disease is required to facilitate shared decision-making, avoidance of the allergen, and treatment of acute reactions when they arise. In addition, patients need to be provided with resources, such as dietary support and education materials, to navigate living with food allergy.

Here, we provided information on the general management of immunoglobulin E (IgE) mediated food allergies. Much of the information is relevant to non-IgE-mediated allergies (such as food protein-induced enterocolitis syndrome, food protein-induced proctocolitis and enteropathy, eosinophilic gastrointestinal disorders) and is covered elsewhere in the primer issue.^{1–3} General principles of management include properly equipping the patient and family with (1)

understanding the patient's disease, including its natural history, (2) training to safely avoid the allergen, (3) recognizing and treating acute reactions, and (4) navigating social and school interactions.⁴ The primary focus for management is on strict avoidance of the allergen and navigating life with a food allergy, but management also includes a continuous reassessment of the allergy, including retesting and oral provocation challenges (covered in "Oral food challenges" section elsewhere in the primer) to investigate natural tolerance when indicated.^{4–6} Important discussion points for food allergy management are summarized in Table 1.

ALLERGEN AVOIDANCE

Avoidance Diets

Strict avoidance (or elimination) diets are the standard for food allergy management.⁵ Successful elimination diets require education on avoidance, including how to read ingredient labels, understand potential synonyms, and recognize "hidden" ingredients. Learning to read labels is an important skill that both family members and the patient need to acquire to successfully avoid the food allergen. Among the common food allergens, some are more difficult to avoid than others. Allergens that play a limited role in our food supply (e.g., shellfish) are easier to avoid than more ubiquitous foods (e.g., cow's milk and egg). Educational handouts and written information on label reading, synonyms for allergens and hidden ingredients are helpful for families. Commonly used examples are available.⁷ In addition, families need to understand that ingredient labeling requirements vary by country or region, particularly when traveling.⁸ See "Food allergy: Labeling and exposure risks"⁹ elsewhere in the primer for further detail.

Of note, for most allergens, strict avoidance of all forms and quantities of the allergen must be practiced.

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Table 1 Important discussion points with patients

Provide education to adequately avoid allergen
Label reading
Avoidance of cross-contamination
Living with food allergies outside of home (school, dining out, and travel)
Provide education to adequately treat allergic reactions
Recognizing signs and symptoms of allergic reactions
Proper epinephrine autoinjector storage and use, training other close contacts
Food allergy action plan
Importance of reassessment of allergies
Periodic food specific IgE testing
Preparing for oral food challenges
Emerging challenges as children grow
Nutritional deficiency screening
Psychosocial screening

However, among patients with milk and egg allergy, some may be able to tolerate “extensively heated” forms of the food allergen without any reaction.¹⁰ “Extensively heated” forms of egg and/or milk have been cooked at 350°F (180°C) for at least 30 minutes.^{10,11} It is thought that the extensive cooking of the protein, together with matrixing of the allergen (with wheat) may change the allergenicity. This is different from simply heating milk or egg. However, exactly why these products may be tolerated is not well understood.

In addition, some ingredients derived from allergenic foods can be safe. These foods are often highly processed and refined, *e.g.*, soy lecithin (for those allergic to soy). In addition, many patients may tolerate commercially processed oils, *e.g.*, highly refined peanut oil (for those allergic to peanuts).¹² Highly refined peanut oil is normally tolerated because the protein has been removed from the product. In contrast, cold-pressed peanut oil may contain peanut protein. A more detailed discussion on “Common food allergens and cross-reactivity”¹³ is covered elsewhere in the primer.

Allergens in Vaccines and Medications

Excipients are ingredients used in medications and vaccines that may be derived from foods. In general, most medications are safe to administer in the patient with food allergy. Many patients and health care providers continue to be concerned about the safety of the influenza vaccine in individuals with egg allergy due to the risk of contamination; however, recent guidelines strongly support administering the vaccine with no special precautions in patients with egg allergy.¹⁴ Currently, the only vaccines of concern in patients

with egg allergy are vaccinations to yellow fever and rabies.⁵ Gelatin in vaccines can also be a concern for patients with a gelatin allergy.¹⁵ However, some patients with a gelatin allergy may still tolerate vaccinations given the low dose of antigen. Most other excipients, such as lactose in medications or oils in skin care products are considered safe.¹²

Nutritional Issues with Avoidance Diets

All patients with a food allergy need to be closely monitored for growth and nutritional deficiencies. These patients require access to a dietician familiar with the nuances of food allergy.^{5,16} In most instances, a particular food allergen can be avoided and another food substituted (*e.g.*, soy milk in place of cow’s milk). However, nutritional deficiencies have been documented in patients avoiding staple foods and in patients avoiding multiple food allergens. In these cases, it is imperative to work with a dietician familiar with food allergies. The dietician can work with families to optimize a patient’s nutritional status, provide recommendations for substitutions, and monitor for growth and nutrient deficiencies.^{8,16,17} Also, after a new diagnosis of food allergy, families may stop the introduction of new foods, and there can be a tendency to limit the diet to known tolerated foods. Reluctance to try new foods can lead to very restricted diets. These diets may increase the risk of nutritional deficiencies and may also increase the risk of developing additional food allergies because oral exposure promotes oral tolerance.^{18–20}

PATIENT AND FAMILY EDUCATION

Training Patients to Recognize and Treat an Acute Reaction

Every patient diagnosed with a food allergy should be properly trained and equipped for managing an acute allergic reaction. Patients need to be able to (1) recognize the signs and symptoms of an allergic reaction, (2) be comfortable with the use of an epinephrine autoinjector device (EpiPen® (Mylan, Canonsburg, PA), AuviQ® (Kaleo Inc, Richmond, VA), or generic equivalent), and (3) understand when to seek further care, such as calling 911. It is the standard of care to provide a patient with an “anaphylaxis action plan” as an aid for the patient to recognize mild and severe reactions. Mild symptoms, such as perioral hives or abdominal pain may be treated with antihistamines. However, severe symptoms or multi-organ involvement require intramuscular epinephrine and emergency evaluation.^{5,8} Doses of these emergency medications should be provided on emergency action plans. Importantly, epinephrine administration should not be delayed when required. Demonstration and training with training devices is required to help families prepare for these

Table 2 Food allergy management Web resources for families

Food Allergy Research and Education: Foodallergy.org
Kids with Food Allergies: Kidswithfoodallergies.org
AAAAI: AAAAI.org/conditions-and-treatments/allergies/food-allergies
ACAAI: ACAAI.org/allergies/types/food-allergy

AAAAI = American Academy of Allergy, Asthma & Immunology; ACAAI = American College of Allergy, Asthma, and Immunology.

situations. General resources for families are listed in Table 2. Please refer to the section Diagnosis and management of anaphylaxis²¹ for more details.

Reading Food Labels

As mentioned above, learning to read food ingredient labels is imperative to reduce accidental exposures and reactions. This topic is covered in-depth in the section in this issue (see Food allergy: Labeling and exposure risks⁹).

Exposure to Food Outside of the Home

Food is consumed in many places besides the controlled environment of the home. Situations include dining out; attending schools, daycares, and after-school activities; traveling with a food allergy; and negotiating social situations, such as birthday parties and play dates. For many patients, dining outside the home can result in significant anxiety. Families no longer have control over the exact ingredients or how the food was prepared and handled.

With regard to eating in restaurants, important tips such as choosing the restaurant, researching menus in advance, and informing wait and cook staff of the allergy should be discussed.²² Patients require education that they cannot rely on menu descriptions alone and must communicate that they have a potentially life-threatening allergy (and not a mere food preference). In addition, certain dining situations are particularly high risk for specific food antigens: bakeries (milk, egg, peanut, tree nuts), buffets, and Asian restaurants (nut, seafood), etc. Handouts and patient education materials are publicly available, and key tips are summarized in Table 3.^{7,23}

Daycare and school settings also present challenges to pediatric and adolescent patients. An additional epinephrine autoinjector two-pack should be prescribed and accessible at all locations where the patient spends significant time, such as at school and after-school activities. School staff members should be trained to deliver the medication, and a copy of the anaphylaxis action plan should be provided to the school.²⁴ See the separate section "Management of food allergy in the school setting"²⁵ in this issue. With regard to summer camp attendance, similar guidance applies. Specific instructions for summer camp include choosing a

Table 3 Tips for travel and dining out with a food allergy for travel

- Traveling
 - Transportation
 - Allow extra time to go through airport security with your medications
 - Preboard the aircraft or vehicle and clean the seat area
 - Bring your own snacks and possibly extras for other travelers around you
 - Destination
 - Choose the correct destination; some may not be good choices for specific allergies
 - Know the location of the hospital at your destination
 - Accommodations
 - Consider accommodations with kitchens or food preparation areas
 - Make special requests far in advance
 - Educate your travel companions on your food allergies, treatment, and location of medications
 - Carry a food allergy card and extra copies of your food allergy action plan
 - Dining out
 - Choose restaurants that best fit: buffets and bakeries are high risk
 - Identify yourself as having a food allergy
 - Ask for an ingredient list or ask to speak directly with the chef
 - Do not forget to ask about your beverage and dessert ingredients
 - Be prepared to leave if you do not feel comfortable
 - Reward restaurants and employees with business, complimentary reviews, and generous tips
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camp that is familiar and comfortable with food allergy, camp proximity and access to medical care, and family comfort with food preparation, and contamination risks at the camp.

Preparation of the Home

Families often have questions about preparing their homes to optimize safety. Efforts should be made to

reduce cross-contamination in the home, secure or remove avoided foods, and use proper cleaning of utensils and surfaces. Although cleaning is obviously important, proper education with regard to true risks and effective cleaning strategies should be addressed to balance risks of cross-contamination and unnecessary anxiety. Please see the section on exposure risks in “Food allergy: Labeling and exposure risks”⁹ in this issue.

PSYCHOSOCIAL SCREENING

Allergy providers must be aware of the psychosocial impact of food allergies on the patient. An allergy provider may also contribute to the well-being of their patients by screening for mental health conditions such as depression, anxiety, and bullying, and a referral to a mental health therapist if indicated.^{19,22} Close follow-up facilitates monitoring of patients at risk. Please see the separate section on “Psychosocial issues and quality of life associated with food allergy.”²⁶

IMPORTANCE OF REASSESSMENT OF FOOD ALLERGY

All patients with a food allergy should have a periodic follow-up with a provider proficient in managing food allergies, at least yearly. The role of the food allergy provider is to (1) monitor for accidental ingestions or exposures, (2) assess development of new food allergies, (3) assess potential resolution of food allergies, (4) re-dose emergency medications as required, (5) screen for psychosocial impacts of food allergy, and, importantly, (6) provide anticipatory guidance on living with food allergies as the child grows. In addition, as new treatments for food allergy evolve, these options need to be discussed (see the articles on new food allergy treatments elsewhere in the primer^{27–29}).

As food allergies change over time, there needs to be continued reassessment of food allergies, retesting by specific IgE testing and possible skin testing (see the section “Food allergy diagnosis differential diagnosis”³⁰), and consideration of oral challenges (see the section “Oral food challenges”⁶ covered elsewhere in this primer). In general, shared decision-making should be implemented to decide when and where oral challenge should be performed (see the section “Shared decision making in food allergy management”³¹). Variables that need to be considered to stratify risk include (1) reaction to exact or similar food, (2) type of previous reaction, (3) length of time since the last reaction (months, years, etc.), (4) previous and current skin and specific IgE testing, (5) comorbidities (such as uncontrolled asthma),³² and (6) comfort level of the patient and family.⁸ For patients with multiple allergies, careful consideration must be given for implementing a strategy to safely introduce other high-risk foods.

Importantly, as the child grows, new issues with regard to living with food allergy need to be addressed at each follow-up visit. Topics to address may include starting daycare or school, navigating play dates and/or birthday parties, addressing any potential bullying and anxiety, attending after-school activities, traveling, and preparing for college. Follow-up visits provide the time and space to discuss these issues in more detail and with helping families anticipate these situations. Developmentally appropriate explanations should be provided to the patient and the family when needed. Anticipatory guidance and education should be developmentally appropriate for the age and maturity of the patient. It is critical that children and adolescents be given increasing responsibility and gradual autonomy as they mature to prepare them for independence. Useful tips on specific important discussion points with parents are provided in Table 1.

CONCLUSION

Management of food allergy is complex and focused on education and counseling with regard to living with food allergies, anticipating the needs of families as children grow, and monitoring for tolerance. Shared decision-making is vitally important with regard to decisions of conducting oral food challenge, managing risk, and emerging therapies. With these approaches, children and families can live fulfilling lives with the diagnosis of a food allergy.

CLINICAL PEARLS

- Patients with food allergy require training on avoidance of the allergen and treatment of acute reactions.
- Patients with food allergy require assessment for growth and nutritional deficiencies as a result of food allergen avoidance.
- The diagnosis of a food allergy should be continually reassessed, and oral challenges performed to determine natural tolerance as indicated.
- Anticipatory guidance with regard to living with food allergy across childhood and the life span should be addressed at each visit as needs and concerns change as the child ages.
- Tips and tricks for navigating challenging situations should be covered.

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