

Food Allergy: What's on the Menu in 2018?



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Food allergies affect up to 6% to 8% of children and 2% to 3% of adults.^{1,2} The incidence of food allergies has increased significantly over the past 20 years.³ Patients and their families may experience significant anxiety related to fear of accidental exposures leading to allergic reactions, as well as social and dietary limitations that negatively affect quality of life.^{4,5} Unfortunately, there is currently no FDA-approved treatment for food allergy. Standard of care consists of food avoidance and keeping rescue medications such as epinephrine and antihistamines readily available for emergency use.

Several major challenges in the management of food allergy are reviewed in this food allergy theme issue of *JACI: In Practice*. Among these is establishing the correct diagnosis. Standard testing for food allergies, including food-specific skin prick test and serum IgE, does not differentiate well between sensitization and actual clinical allergy. Although larger skin prick tests or higher serum-specific IgE value are associated with greater likelihood of clinical food allergy, specificity of these tests is relatively low. In view of these limitations, it is not uncommon for patients to seek other nonvalidated types of testing and for practicing allergists to be asked to interpret these results. This theme issue incorporates a comprehensive review of the unconventional testing for adverse reactions to food,⁶ including tests such as flow cytometry, measurement of serum IgG or IgG4 antibodies directed against foods, intradermal provocation-neutralization with food allergens, hair analysis, electrodermal testing, and applied kinesiology. The article provides a valuable general overview for the practicing allergist of each technique while illustrating the lack of scientific evidence behind their validity and sometimes even the potential harm from using such techniques for ruling in or out food allergy.

With the pitfalls associated with food allergy testing, food challenges remain the gold standard for diagnosis, and prompt

use of food challenge is associated with substantial cost savings.⁷ However, challenges are time and resource intensive and carry the risk of an anaphylactic reaction. It is therefore very important to carefully identify patients who are most likely to benefit from a food challenge. Although the vast majority of allergists surveyed indicated the need to conduct food challenges in their practice, 3 barriers for performing them were identified: time, inadequate reimbursement, and risk of adverse reactions.⁸ MacGinnitie and Young⁹ review the methodology of food challenges, including eligibility criteria, location of the challenge (office, tertiary care center, home), criteria for stopping the challenge, recommendation for a formal informed consent before initiating the procedure, and strategies for billing. Special considerations are discussed, including performing food challenges in adult patients with comorbidities or use of medications that could suppress the effect of epinephrine, have an antihistamine effect or accentuate an allergic reaction, and food challenges for non-food IgE-mediated food reactions. The authors argue that the increasing need for performing food challenges must be balanced against high-resource utilization such as nursing supervision and prolonged occupation of clinic space, along with concerns with inadequate support to treat potential anaphylaxis in the office. They conclude that food challenges are still underperformed in clinical practice, but that innovation and careful planning is required to optimize the use of this procedure.

As the current standard of care for food allergy is dietary avoidance, patients and their families rely on allergen declarations on packaged food. Although mandatory labeling of common allergic foods intentionally present in packaged food was enacted in many countries, voluntary precautionary allergen labeling (PAL) adopted by the food industry has become more widespread in recent years. The necessity of avoiding products with PAL and the effect of PAL on patient safety and quality of life is controversial. There is evidence that patients/families who avoid products with PAL spend more time shopping for foods, and pay, on average, more than the nonallergic consume.¹⁰ In this issue, Allen and Taylor¹¹ offer an extensive review of the significance of PAL and its related misconceptions, and discuss the pros and cons of the current system of PAL labeling. For example, some consumers wrongly think that PAL labeling is mandatory and well regulated, or that the amount of allergen in food with PAL statements is always low. Some believe that if they consume a product bearing a PAL statement on one occasion, they can safely consume the product on future occasions. Surveys of young food-allergic adults in the United States and teenagers in the United Kingdom found that the majority of them ignored "may contain" statements.^{12,13} A Canadian survey found that 8.3% of food-allergic subjects reported developing allergic reactions after consuming food products with PAL.¹⁴ The food industry does not have enough guidance to determine safe,

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tolerable levels of allergen residues and thus apply PAL even when there is no detection of allergen residues. The authors conclude that the current PAL labeling does not serve the consumer well. They discuss the importance of international efforts to define the threshold of allergens that would trigger PAL and examine the utility of adopting a risk-based approach for the use of PAL. Such an approach was pioneered by the Allergen Bureau of Australia and New Zealand, who established the VITAL (Voluntary Incidental Trace Allergen Labeling) program, in which population thresholds or reference doses are developed based on exposure levels that would be predicted from oral food challenges to elicit objective response in only a small percentage of food-allergic population. The VITAL approach has been endorsed by the US National Academy of Sciences and the International Life Sciences Institute-Europe, but the authors point out that without support from public health authorities, it is unlikely that the food industry will adopt the VITAL recommendations.

Although there is currently no FDA-approved therapy for food allergy, different therapeutic modalities are currently being evaluated. We discuss in this theme issue the current status of food immunotherapy and many of questions related to these approaches that remain yet unanswered.¹⁵ Based on the relatively small number of studies published, oral immunotherapy (OIT) appears to be very successful at inducing desensitization, whereas sublingual immunotherapy (SLIT) and epicutaneous immunotherapy (EPIT) have more variable success. However, in the short term, OIT appears to be associated with higher rates of reactions than would be expected for patients who are not being treated for food allergy, whereas SLIT and EPIT appear to be much safer during dosing, although local symptoms are common. At this point, all of the immunotherapies are expected to require long-term administration, and patients should understand that exposure will need to continue many years, if not for life, for the effect to persist. It is unclear whether patients on such therapies, particularly EPIT and SLIT, will be protected from most accidental exposures, and whether this effect depends on the maintenance dose. Optimal maintenance dose and frequency of OIT is unknown. The risk/benefit analysis of such therapies in patients with a history of a severe life-threatening allergic reaction remains even more unclear, and some patients may require adjunctive medications to tolerate immunotherapy. A significant challenge is that there are currently no markers that predict subsets of patients for whom immunotherapies may be more or less safe and/or effective. Because it is unclear whether immunotherapies will result in more or fewer allergic reactions in the long term, longitudinal studies comparing treated patients with allergic subjects observing avoidance will be required to evaluate the effects of immunotherapies on safety and quality of life of patients and their families.

Finally, recent groundbreaking studies suggest that early allergen exposure may prevent food allergy. Turner et al¹⁶ review challenges in translating this evidence to design population level recommendations. They use the GRADE (Grading of Recommendations Assessment, Development and Evaluation) tool to evaluate the evidence relating to food allergy prevention,

concluding that only introduction of egg and peanut in the infant diet has at least moderate evidence of effectiveness. They further discuss the difficulty in generalizing from the clinical trials conducted thus far to other populations, including in resource-poor settings, and the potential unintended consequences of community-based prevention strategies. Most important of those unintended consequences are the potential to reduce breast feeding and the risks of increased screening. The authors counsel caution in developing and implementing strategies for food allergy prevention and suggest that all strategies have robust programs to evaluate the effects of community-wide prevention strategies.

In conclusion, this food allergy theme issue in *JACI: In Practice* highlights some of the major challenges currently faced by patients, their families, and their health care providers. Additional work is critically needed to address all of these obstacles and improve the diagnosis, approach, treatment, and prevention of food allergy.

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