

# The changing CARE for patients with food allergy

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**Overall Purpose/Goal:** To provide excellent reviews on key aspects of allergic disease to those who research, treat, or manage allergic disease.

**Target Audience:** Physicians and researchers within the field of allergic disease.

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**List of Design Committee Members:** Stacie M. Jones, MD, and A. Wesley Burks, MD

#### Activity Objectives

1. To discuss recent advances in food allergy diagnosis, treatment, and prevention.
2. To discuss therapies that are under investigation to treat food allergies.

**Recognition of Commercial Support:** This CME activity has not received external commercial support.

#### Disclosure of Significant Relationships with Relevant Commercial

**Companies/Organizations:** S. M. Jones is on the Food Allergy & Anaphylaxis Network medical advisory board; has received research support from the National Institutes of Health, the Food Allergy & Anaphylaxis Network, and the National Peanut Board; has received lecture fees from Abbott Nutrition International, the Kentucky Society for Allergy, Asthma & Immunology, the New England Allergy Society, the American College of Allergy, Asthma & Immunology, Indiana University Medical School and Riley Children's Hospital, the Spanish Society of Allergy and Clinic Immunology, and the Oregon Allergy Asthma and Immunology Society; and has served on the National Institute of Allergy and Infectious Diseases (NIAID) Safety Monitoring Committee, the Arkansas Medicaid Drug Review Committee, and an NIAID Study Section. A. W. Burks has received research support from the National Institutes of Health, Department of Defense, and the Wallace Research Foundation; is on the boards for the American Academy of Allergy, Asthma & Immunology, the Food Allergy Initiative, the *Journal of Allergy and Clinical Immunology*, the US Food and Drug Administration, and Acto-GeniX; has received consultancy fees from Dow AgroSciences, Exploramed Development, Merck, Novartis Pharm AG, Schering-Plough, Unilever, and McNeill Nutritionals; is employed by the University of North Carolina at Chapel Hill and Duke University; has received lecture fees from Abbott Laboratories and Mylan Specialty; receives royalties from UpToDate; received payment for the development of educational presentations from Current Views; is a minority stockholder in Allertein; and has received travel support from the European Academy of Allergy and Clinical Immunology.

The field of food allergy is continually changing, with advances in clinical care to better understand the mechanisms of disease and in possible new diagnostics and treatment models. The development of several new guidelines that focus on improving the standardization of the diagnosis and management of food allergy has helped to further guide clinicians in providing optimized care for children and adults with food allergy around the world. Much of this work has been made possible through the collaborative efforts of advocacy organizations, industry, and government with clinicians and researchers in the fields of allergy and immunology. We have been able to advance our understanding of disease mechanisms and to help close gaps in knowledge and resolve misconceptions in the treatment of food allergy. This review will focus on the concepts of a holistic approach to food allergy that is working to improve CARE for subjects with food allergy, including new advances in clinical

care, advocacy, research, and education. (*J Allergy Clin Immunol* 2013;131:3-11.)

**Key words:** Food allergy, advocacy, school programs, immunotherapy, therapeutics, food allergy education, food allergy labeling, food safety, food allergy diagnostics

Adverse reactions to foods and the clinical scenarios surrounding those events have been described since the 19th century. In the early to late 1900s, food allergy was referenced almost exclusively in case reports and clinical descriptive studies. Over the last 30 years, the field of food allergy has advanced from a general area of clinical suspicion and description without strong scientific evidence to an area of directed Clinical Care, Advocacy, Research, and Education (CARE) focused around a strong base of knowledge and growing evidence.

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*Abbreviations used*

AAAAI: American Academy of Allergy, Asthma & Immunology  
 CARE: Clinical Care, Advocacy, Research, and Education  
 CFSAN: Center for Food Safety and Applied Nutrition  
 CoFAR: Consortium of Food Allergy Research  
 CPT: Current Procedural Terminology  
 CRD: Component-resolved diagnostics  
 EPIT: Epicutaneous immunotherapy  
 FAAN: Food Allergy & Anaphylaxis Network  
 FAI: Food Allergy Initiative  
 FARE: Food Allergy Research & Education  
 FDA: US Food and Drug Administration  
 IG: Ingestion challenge  
 OFC: Oral food challenge  
 OIT: Oral immunotherapy  
 SLIT: Sublingual immunotherapy

Approximately 12 million Americans have food allergy, including up to 8% of children and 2% of adults, and the prevalence of food allergy is similar among other westernized countries.<sup>1-4</sup> Additionally, more than 170 different foods have been reported to cause allergic reactions, making the management of food allergy even more complex.<sup>5</sup> The mechanisms causing food-induced allergic reactions can be IgE mediated, non-IgE mediated and related to cellular mechanisms, associated with eosinophilic inflammation, or a mixture of multiple mechanisms. It is widely accepted that most of these mechanisms of food allergy are often associated with life-threatening reactions and typically require significant alterations in the lifestyles of affected subjects to remain safe.

Food allergy is further complicated by varied misconceptions within the medical community and the public at large. These include limited diagnostic tools and treatment options, confusing labeling laws and high-risk settings for certain subjects, and a significant societal and health care economic effect of disease. This review will focus on the concepts of a holistic approach to food allergy that is working to improve CARE for subjects with food allergy, including new advances in clinical care, advocacy, research, and education. Applying the concepts of CARE will not only help the clinician to maintain a comprehensive approach to food allergy but will also be a framework for continued efforts in maintaining future initiatives in the field.

**CLINICAL CARE****Guidelines development**

The clinical care of patients with food allergy has relied heavily on clinical history, with correlations to the timing of food allergen exposure and associated symptoms. Diagnostic tools to date have primarily focused on IgE-mediated food allergy with implementation of skin prick and allergen-specific IgE testing to make the correct diagnosis or rule out IgE-mediated disease, as in the case of food protein-induced enterocolitis syndrome. In December 2010, the National Institute of Allergy and Infectious Disease-sponsored "Guidelines on the diagnosis and management of food allergy" were published.<sup>5</sup> These guidelines are the first comprehensive overview of food allergy designed to outline state-of-the-art information on diagnosis, management, and natural history for all types of food allergy. The publication of these guidelines provides a tool for the clinician to review his or her knowledge base, as well as an opportunity for standardization of practice in caring for patients

with food allergy. Although the National Institute of Allergy and Infectious Disease guidelines are a huge leap forward, they also help to identify key knowledge gaps; there is still a lack of clear directives on day-to-day care of patients with food allergy. The guidelines emphasize consistent diagnostic criteria and firm evidence-based management strategies. They also highlight the fact that significant work is needed with regard to non-IgE-mediated disorders and eosinophilic gastrointestinal diseases.

In early 2012, the International Collaboration in Asthma and Allergy assembled an expert panel from around the globe to establish an international consensus on food allergy to summarize diagnosis, management, and special issues in food allergy that are noted worldwide.<sup>6</sup> This document serves as a resource for physicians caring for subjects with food allergy in the global health care community. Additionally, the European Allergy and Asthma guidelines have been published as a working document for food allergy diagnosis and management in Europe,<sup>7</sup> and the Diagnosis and Rationale for Action against Cow's Milk Allergy guidelines<sup>8</sup> were published recently on the international management of milk allergy. All of these documents function to provide important consensus standards for the appropriate care of patients with food allergy but should be taken in consideration based on the target audience. They also emphasize the importance of ongoing attempts to further refine consensus in the global community through collaborative work among food allergists. Additionally, a committee formed by the Joint Council of Allergy and Immunology is preparing an updated food allergy practice parameter with the goal of providing a streamlined functional approach to food allergy for the practicing clinician. Professional working groups from the Adverse Food Reactions Committee of the American Academy of Allergy, Asthma & Immunology (AAAAI) have also published very helpful management tools, such as for the performance of oral food challenges (OFCs),<sup>9</sup> and a maintenance of certification program focused on food allergy is forthcoming from the AAAAI.

**New diagnostic tools**

Component-resolved diagnostics (CRD) testing has recently been approved by the US Food and Drug Administration (FDA) for peanut allergy testing and is emerging as a novel diagnostic and research tool for several foods. This technology uses allergenic proteins derived from recombinant DNA technology or purification from natural sources to identify a patient's specific IgE reactivity to specific recombinant allergenic proteins rather than whole allergen.<sup>10</sup> The current evidence base does not support broad clinical use of CRD testing for the diagnosis of food allergy, but CRD might prove to be very useful in the future.<sup>5,6,8</sup>

Studies evaluating the clinical utility of CRD for specific allergens have shown promising results for a relatively small number of foods, with the greatest strides made for peanut allergy. Recent studies have demonstrated specific IgE antibodies to Ara h 2 as the most common peanut allergen associated with clinical reactivity.<sup>11,12</sup> In a limited population of young children, sensitization to Ara h 1, 2, or 3 has been associated with increased reaction severity for certain subjects.<sup>13</sup> Recent studies also suggest that the presence of Ara h 8 alone in patients with birch pollen allergy (with positive Bet v 1 results) might be the source of cross-reactive proteins that increase whole peanut IgE levels to high levels without clinical relevance.<sup>13,14</sup> These findings suggest

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