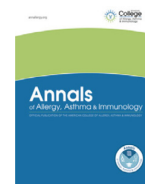




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Review

Growing up with allergies Transitioning from adolescence to adulthood

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Key Messages

- The transitional features of adolescence and young adulthood pose unique psychosocial challenges and opportunities for the development of lifelong healthy habits regarding the management of allergic diseases.
- Erik Erikson's model of the stages of psychosocial development is a useful framework through which the challenges of this population may be understood.
- Changes to living situation (eg, residential college environment) pose unique challenges that can affect mental health and optimal disease management.
- It is important for health care professionals to understand how and why patients use social media and to acknowledge the benefits of social connectedness while combatting the risks of misinformation.

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ABSTRACT

Allergic disease management for adolescents and young adults requires consideration of unique psychosocial challenges and opportunities. Erik Erikson's model for the Stages of Psychosocial Development is a useful lens through which we can understand adolescent and young adult experiences with allergic and immunologic disease, particularly with regard to identity and relationship development. It is important to provide anticipatory guidance for patients who are transitioning environments (eg, home to college), with attention to the anxiety-provoking demands for increased responsibility on top of new stressors such as academic and vocational demands. It is critical that health care professionals use an empathetic, shared decision-making approach regarding the emotional impact of allergy on a patient's social engagement. A patient's ability to develop positive lifelong habits is also shaped by their environment's "culture of wellness," and clinicians can encourage habits to promote healthy choices and effective disease management. Social media provides opportunities and challenges as a conduit for both social connection and possible misinformation. Overall, allergic disease management in adolescents and young adults is a "high-risk, high-reward" period of time—and with awareness, anticipation, and proactive action, health care professionals can better serve patients by leveraging this transitional period to promote positive approaches to management of allergies and asthma, trusting relationships, and personal responsibility.

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Introduction

The management of allergic disease is challenging for patients of any age. Adolescents and young adults in particular experience significant psychosocial changes during this period of rapid growth in personal responsibility and independence (though variation exists across cultures). This age demographic is often accompanied by an environmental shift such as living alone for the first time (eg, moving away for college or a new job). These changes are accompanied not only by significant emotional and social stress but also by unique challenges to disease management. As adolescence and young adulthood is a highly transitional stage in life, the habits of this age demographic are malleable. This period therefore has the potential to jeopardize or optimize health care management and must be anticipated so that patients can establish optimal and sustainable lifelong habits and patterns of allergic and immunologic disease management.

Health care professionals (HCPs) are uniquely situated during this transformative period to help patients increase their self-efficacy, support them through accompanying emotional challenges, and establish longitudinal trusting patient-HCP relationships. This article aims to empower HCPs to do just that by providing an overview of the challenges and opportunities faced by this patient population. We discuss conceptual frameworks for psychosocial changes in this age demographic, the importance of preparing patients and their families for environmental changes, the overlapping and distinct challenges of various allergic diseases (including asthma and food allergy, which are particularly sensitive to changes in environment), and the role of social media in patient education and clinician relationships. We hope that by providing this overview, HCPs will be better able to capitalize on the malleable and “high impact” psychosocial circumstances of this age demographic.

Erikson's Stages of Psychosocial Development

HCPs working with adolescent and young adult patients with allergic diseases may want to use Erik Erikson's Stages of Psychosocial Development as a framework for understanding allergy-related experiences and challenges unique to this age group.¹ Erikson's theory was initially published in his book, *Childhood and Society*, and proposed that individual human development progresses in a series of 8 predictable sequential stages (Table 1).^{1,2} Each stage is affected by biological, psychological, and social factors and characterized by a unique overarching psychosocial challenge that pushes the individual toward growth and adaptation.¹ Erikson describes 2 opposing sides of each psychosocial challenge that the individual must confront and ultimately decide how to balance as they move forward in life.² The way in which the individual responds to this psychosocial challenge influences perception of their self and the way they interact with the world and others.^{1,2}

Most pertinent to this review are stages 5 and 6 of Erikson's theory—adolescence and early adulthood.^{1,2} During adolescence (ages 12–18 years), stage 5, individuals begin to consider what their life will

look like when they are adults. They consider relationships, careers, and how they want to live and belong in society. Thus, during stage 5, the primary task for the adolescent is to consider their values, interests, and goals to develop their own unique identity, and the psychosocial challenge during this stage is identity vs role confusion. Adolescents can develop a strong sense of self, accompanied by feelings of independence and control in their life if they are given the opportunity to freely explore different roles. In practice, this exploration may look like adolescents trying out a variety of social groups, activities, and behaviors. Crucial to this developmental stage is the role of social relationships. Adolescents need to be supported by close family and friends in their identity exploration. They also spend an increasing amount of time with peers, and therefore, social acceptance and feeling a sense of belonging with their peers promote healthy identity development. Adolescents who successfully navigate this psychosocial challenge have a strong sense of self whereas adolescents who struggle with this challenge may be unsure about how they fit into society and confused about their personal path or purpose.

The central task of early adulthood (ages 19–39 years), stage 6, is for individuals to form intimate, lasting relationships with other people.^{1,2} These relationships can include romantic and sexual relationships, but equally important is the formation of close, reciprocal lasting relationships with friends, family members, and others. Thus, during stage 6, the psychosocial challenge is intimacy vs isolation. These relationships are formed through mutual respect, trust, and disclosure of intimate feelings. Early adults who successfully navigate this psychosocial challenge emerge with a foundational supportive social network that promotes feelings of safety and commitment within these relationships and overall physical and mental health. Early adults who struggle with this challenge may lack social connections and social support and feel lonely and isolated.

Allergic disease management directly intersects with both these psychosocial stages and their respective challenges (Table 2). During adolescence, patients are increasingly responsible for decisions about how they manage their illness and daily management behaviors, such as avoiding allergic triggers, carrying medication, symptom monitoring and treatment, and disclosing and communicating about medical needs.³ Adolescents need to consider how their allergic disease fits into their identity. Just as adolescents explore different career paths and social roles, they may also explore different disease management styles (Table 3). Similarly, just as peer acceptance is important for these other aspects of identity, peer acceptance and support are important for successful integration of allergic disease management into daily life. A meta-aggregation of qualitative research conducted with adolescents with food allergy supports the importance of Erikson's stage 5 psychosocial challenge: 2 of the 3 primary identified themes were “defining the allergic self” and “finding a balance.”⁶ During early adulthood, the formation of close relationships can lead to a supportive network of romantic partners, friends, and family who are aware of the individual's allergic diseases and supportive of their engagement in health-promoting behaviors.

Table 1
Erikson's Stages of Psychosocial Development

Stage	Age	Psychosocial challenge	Description
Infancy	0–18 mo	Trust vs mistrust	Trust that basic needs will be met
Early childhood	18 mo–3 y	Autonomy vs shame	Develop a sense of independence
Play age	4–6 y	Initiative vs guilt	Take initiative on some activities
School age	7–11 y	Industry vs inferiority	Develop self-confidence in one's abilities
Adolescence	12–18 y	Identity vs role confusion	Develop identity and roles
Early adulthood	19–39 y	Intimacy vs isolation	Establish intimacy and relationships with others
Middle age	40–64 y	Generativity vs stagnation	Be part of a family and contribute to society
Older age	65 y +	Ego integrity vs despair	Make sense/meaning of life and one's contributions

Table 2
Adolescent and Young Adult Developmental Tasks and Allergic Diseases

Developmental task	Allergic disease(s) considerations
Puberty	Impact of biological changes on food allergic reaction threshold
Identity development	Changing perceptions of self and allergies fit in
Complex thinking	Ability to plan for allergy needs
Separation from parents	Allergy management transitions from parent to adolescent/young adult
Peer identification	Peer norms; peer support vs bullying or indifference
Intimate relationships	Allergy disclosure to partner
Health behavior	Risk taking (ie, carrying medication, reading food labels)
Vocational aspirations	Allergy disclosure to colleagues; need to plan for at-work allergy triggers
Higher education aspirations	Navigation of allergy needs in new shared living spaces, cafeterias, etc.

Preparing Students and Their Families for College

Students with chronic health conditions, such as allergies, are at increased risk of poor quality of life when transitioning to college.⁷ However, if they have greater health care management skills, their health-related quality of life is much improved.⁷ Working with patients to engage in their own health care management and advocacy will empower them as they transition to living on their own at college. Often patients transitioning from adolescence to young adulthood have not coordinated or managed their own health care needs. This transition can be challenging for both patients and their caregivers, increasing stress and anxiety.

The adolescent and college years involve major transitions, especially from developmental, identity, and psychological standpoints.^{1,3} Existing allergic conditions can affect these transitions. The allergist/immunologist and other HCPs should be aware of these significant issues.

For students, living away from their caregivers' homes for the first time can be daunting. Existing anxieties can increase from dealing with new financial responsibilities, health insurance issues, and new pharmacies. In addition to administrative stressors, students often face new foods, change in seasonal environments, change in sleep/

wake routines, and academic stressors, all of which can affect their immune response. For patients with food allergies, these transitions can exacerbate anxiety and depression.⁸ Planning for these changes helps to empower young adult patients as they make this transition.

Many colleges are in smaller populated areas without local allergy or immunology specialists, and the student's primary allergist immunologist will oftentimes be consulted to continue their health care management remotely. Telehealth can be used for this purpose; however, the HCP must be aware of state laws regarding providing telehealth services across state lines.⁹ If the clinician is not licensed in the state where their patient is going to school, allergist immunologists can alternatively work with the HCPs at the educational institution's student health center to consult on their patient's care while their patient is away.

Opportunities and Challenges in Disease Management During Developmental Transition From Adolescence to Adulthood

The prevalence of allergic rhinitis has been estimated at 28% in adolescents, and simple effective treatment options (such as combination therapy with an intranasal steroid and intranasal

Table 3
Allergy Life Skills to Consider During College and How HCPs Can Help

Life skill	How HCPs can help
Housing	Review housing options with patient/family members to identify potential allergy triggers, such as age of building, carpet, and type of heating. Inquire whether a medical waiver is required to request specific allergy-sensitive housing.
Cleanliness	Review managing bedding: mattress cover, pillow coverings, how often to wash linens. Encourage patients to review managing how to launder their clothing and bedding. Discuss having cleaning supplies on hand to remove potential allergens on arrival to living space.
Avoidance of food allergy cross-contact	Many colleges have food service dietitians and managers who will work with students to address allergy needs. Discuss and review potential food cross-contamination and how to respond if they experience an exposure. Review process and use of prescribed epinephrine devices.
Communication with roommates and friends	Before roommate assignment, it is important for the patient to communicate environmental and food allergies and expectations. Some colleges require students to develop a roommate contract within the first week of school. It is not uncommon for patients to forget about their normal health routine once they go away to college.
Overall physical and mental health	Changing from dietary routine can lead to gastric distress and impaired nutrition. We encourage students to maintain their normal dietary routine as much as possible.
Diet	60% of all college students have poor sleep quality, and 7.7% meet all criteria of an insomnia disorder. ⁴ There is a direct relationship to increased rates of depression and anxiety with decreased sleep in college students.
Sleep	Fitness is an important aspect of wellness, and evidence suggests that regular exercise may decrease airway inflammation and allergic symptoms. ⁵
Exercise	Smoking, vaping, and alcohol use often first occur in college with student experimentation.
Smoking, vaping, alcohol use	Review where patients will store their daily medications and how they will maintain their routine once in a new living community.
Daily medications	Identify where prescriptions should be sent for easy access once a patient has moved to college and when follow-up appointments can be made in coordination with school breaks.
Prescription refills	Have patient or family members identify points of contact at the student health center. Each college health center is uniquely staffed and will provide a range of services from a simple nurse visit to a fully staffed primary care clinic.
Coordination of treatment with health center	Review and provide copies of the patient's asthma action plan to college health clinic and to the patient. Also review when and why the use of epinephrine is imperative in treatment of anaphylaxis. Discuss and teach use of epinephrine delivery device and importance of medical follow-up.
Anaphylaxis and asthma attack plans	

Abbreviation: HCP, health care professional.

antihistamine for moderate or severe persistent symptoms) combined with environmental avoidance can provide significant benefit.^{10,11} Environmental control measures can be extremely variable with different housing options, including dormitories, apartments, and homes. Levels of cleanliness can be inconsistent, with multiple levels of carpeting, rugs, and flooring. Specific allergen avoidance measures routinely practiced at home (ie, mattress, box spring, and pillow coverings for patients with dust mite allergies) may be poorly implemented as young adults begin to live away from home, many for the first time. Many colleges have student clinics, but the levels of health care services are variable. For patients receiving allergen immunotherapy, navigating injections with an appropriate HCP can be challenging. Experiencing a systemic reaction to allergen immunotherapy is always frightening, but anxiety can be further exacerbated by isolation from family and support structures back home while at college. Awareness of new paradigms of care is important to improve rapid use of epinephrine for severe allergic reactions. For example, the most recent Allergy Immunology Joint Task Force Practice Parameter on Anaphylaxis highlights early use of epinephrine for severe allergic reactions with an appreciation that concerns about activation of emergency medical services should never present a barrier to appropriate epinephrine use.¹²

An estimated 9.5% of individuals aged 20 to 24 years of age have current asthma, and many students may benefit from newer paradigms of asthma management that allow streamlined management with a single maintenance and rescue inhaler (SMART).^{13,14} Many young adults are underinsured and may lack a regular HCP—a situation which highlights the importance of policy change to improve access to a SMART device (eg, budesonide-formoterol).¹⁵ Of course, in patients both with and without asthma, it is important to assess electronic vaping products, marijuana use, and smoking while discussing challenges and opportunities through cessation-related counseling.¹⁶ Notably, use of electronic vaping products during adolescence has been associated with an increased lifetime risk of asthma—an association made stronger when vaping products are used in combination with marijuana and cigarette smoking.¹⁷

College stressors and life transitions can complicate asthma management beyond allergen avoidance, particularly in patients with vocal cord dysfunction and exercise-induced laryngeal obstruction (EILO).^{18,19} Respiratory and voice symptoms are common in the general college population.²⁰ In a study of 571 college students, shortness of breath, hoarseness, dry cough, and vocal fatigue were frequently reported (15.2%, 14.9%, 12.3%, and 11.7%, respectively).²⁰ Particularly in regard to college athletics, recognition of EILO is important to distinguish from asthma and the 2 conditions may often co-exist.^{18,21} Olin et al¹⁸ reported on a cohort of 219 individuals with mild to severe EILO, providing a patient-reported 12-item outcome measure specifically for adolescents and young adults with EILO, which may be a useful tool to assess clinical response to interventions.²²

Self-reported food allergy prevalence in adults has been estimated to be at least 10.8% (>26 million persons in the United States alone), with slightly lower food allergy rates estimated in children and adolescents.^{23–25} For students with food allergy, understanding of food allergens is an important factor in allergy management.^{25,26} In a nationwide sample of college students, food allergy knowledge accounted for 20% of variance in individual allergy management behaviors ($P < .001$); however, somewhat surprisingly, college students with food allergies did not have greater knowledge than those without food allergies.²⁷ Ownership and understanding of an individual's allergies significantly predict allergy management behaviors above and beyond food allergy severity and reactions.²⁷ In a study by Warren et al,²⁵ lower risk-taking self-management was reported in adolescents with peanut allergy (odds ratio [OR], 0.27; 95% CI, 0.11–0.65), supportive female friends (OR, 0.27; 95% CI, 0.07–0.99), “over-protective mothers” (OR, 0.42; 95% CI, 0.18–0.97), teachers who are

aware of their food allergy (OR, 0.39; 95% CI, 0.17–0.91), a history of being bullied (OR, 0.22; 95% CI, 0.09–0.51), and an established 504 education plan (OR, 0.35; 95% CI, 0.15–0.81).²⁵ More than a quarter of adolescents in this study reported food allergy as a barrier to employment, and those with more “risky behavior” were more likely to report that food allergy impeded their ability to spend time with friends.²⁵ Although the relationship between features associated with decreased risk behavior and larger goals of adolescent development as viewed through Erikson's stages of psychological development is less certain, less risky behavior was associated with greater responsibility, empathy, and improved diet.²⁵ Notably, use of alcohol and other substances that impair judgment can interfere with safe decision making, and alcohol can increase the risk of anaphylaxis.²⁸ Recent educational handouts regarding food allergy management across development provided by the American Academy of Allergy, Asthma & Immunology (AAAAI) Adverse Reactions to Foods Committee can be particularly valuable for young adults navigating challenges of food allergy with greater independence.^{3,29}

Additional unique challenges in the college transition may occur among patients with other conditions managed within allergy immunology clinics, such as hereditary angioedema (HAE) and immunodeficiency.^{30,31} For example, Tuong et al³⁰ described barriers to self-administration of HAE therapies including care coordination, training, and supply chain issues. In terms of antibody replacement for patients with primary antibody immune deficiency (PAD), a survey of 119 patients with PAD suggested heterogeneity in patient concerns about frequency of infusions, adverse effects, number of needles required per infusion, length of infusion, and need to switch between therapies.³¹ With multiple subcutaneous immunoglobulin replacement products (eg, variable concentrations of 10%, 16.5%, or 20%) and schedules (eg, monthly, bimonthly, weekly, biweekly, or more often), life changes that may require insurance transitions can pose unique challenges to adolescents and young adults.³¹

A myriad of individual preferences and developmental changes occurs on a landscape of personal growth, academic challenges, and chronic disease for young adults with allergic disease who attend college.³² Establishing good rapport and a trusting relationship with students can lead to lasting partnerships in health which encourage adolescents to make wise investments in wellness and health promotion.³³ Furthermore, a student's learning to accept personal responsibility for health and wellness can become a lifelong habit with community implications through peer engagement and social networks.³⁴ Opportunities for shared decision making are pronounced across allergic diseases, and leveraging tools and strategies to elicit patient preferences in the context of expert clinician advice can improve health outcomes during young adulthood.^{35,36}

Promoting Wellness on Campus

Addressing the individual wellness needs of students is vital throughout the college years (Table 3).³⁷ Multiple stressors exist, including financial, academic, and social. A new environment can be challenging, leading to social isolation. Basic wellness tips include obtaining adequate amounts of sleep, exercise, and nutrition.³⁸ Notably, 60% of all college students have poor sleep quality, and 7.7% meet all criteria of an insomnia disorder.⁴ Dimensions of wellness include emotional, spiritual, intellectual, physical, environmental, financial, occupational, and social aspects (Fig 1). Healthy coping mechanisms include the use of spirituality, humor, mindfulness, and a general positive attitude.³⁹ Improving individual resilience involves self-care, work-life integration, and social and family support.^{37–40} Fitness is an important aspect of wellness, and evidence suggests that regular exercise may decrease airway inflammation and allergic symptoms.⁵ Generating a “culture of wellness” is essential.^{37,41} Joining student organizational clubs, activities, or groups can help reduce social



Figure 1. Dimensions of wellness. Young adults must find a balance in life to work toward wellness in multiple aspects of their lives. Image reproduced from ShareAlike 4.0 International by CC BY-SA 4.0 DEED.

isolation.³⁷ Peer support can help mitigate academic and social stresses.^{37,41} Using both on-campus and external counseling and mental health services can also be helpful.

Navigating Social Media and Misinformation

In the last 10 years, social media has drastically altered the manner in which we acquire and share information with one another.^{42–44} This is especially true for the coming-of-age demographic transitioning into adulthood.¹ In the context of allergy, understanding how and why adolescents use social media is essential for creating effective strategies to address health misinformation with them on a personal and societal levels.

Social media can serve many positive roles. Patients use social media to develop a sense of connectedness with others living with similar conditions and for empowerment, enhancing their overall subjective and psychological well-being.⁴³ It is helpful to find and identify with others living with similar health conditions. However, despite these positive elements, teens and young adults face the challenge of discerning credible medical information from misinformation on social media. The ability to validate information online has become increasingly challenging as inaccurate information spreads more quickly than factual sources (Fig 2).^{45,46} Furthermore,

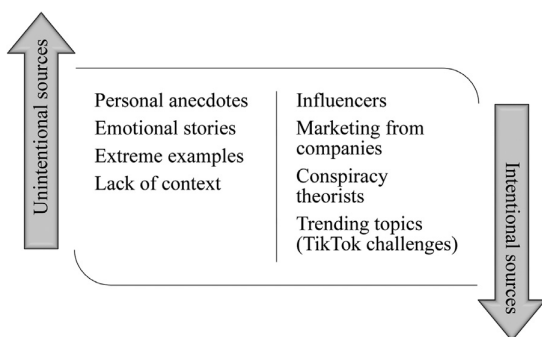


Figure 2. Sources of misinformation online.

adolescents use social media daily, sometimes continuously throughout the day.⁴⁷ This combination of high exposure with misinformation increases the potential for negative influence on young adults.

Moreover, young adults may turn to social media influencers and celebrities for their health information, not necessarily medical experts.⁴⁸ Credibility and authority online are based on the popularity of an individual and not their actual level of expertise.⁴⁹ Lim et al⁴⁸ highlight how instinct and the idea of “realness,” such as a social media influencer who shares personal experiences, are important factors young people consider when judging trustworthiness. This creates a scenario in which young adults choose information based on a more intangible, personal, connection to the presenter.

Social media as the primary source of health information for young adults is nearly axiomatic. Yet, navigating how to address misinformation on social media is intimidating. Clinicians can take specific steps to help. First, it is important to become familiar with current use trends of young adults and the “influencers” who are popular on each platform and the information they provide. In 2022, YouTube was the most common platform (95% usage), followed by TikTok (67%), Instagram (62%), and Snapchat (59%) for teens aged 13 to 17 years old.⁴⁷ Channels are used differently, as young adults actively seek out health information on YouTube, whereas health information is passively found on Facebook.⁵⁰

Second, HPCs should encourage discussions with patients regarding their use of online resources for health information. Shaker⁵¹ suggests approaching this situation with empathy, and Patrick et al⁴³ recommend using anecdotes and narratives to foster a sense of connection. Last, a forward-thinking approach is for clinicians to establish their own social media presence as a source of valid, trustworthy information.⁵²

Navigating misinformation on social media with young adult patients with allergy does not have to represent an insurmountable task. Understanding social media use habits, coupled with some of the above-mentioned simple steps, will ultimately strengthen patient-clinician relations.

Conclusion

This article provides an overview of the unique challenges and opportunities of allergic disease management for adolescent and young adult patients. In considering this patient population, it is helpful to have a conceptual framework. We suggest the use of Erik Erikson's Stages of Psychosocial Development as a tool for understanding allergy-related experiences. Stages 5 and 6 of Erikson's model parallel disease management decisions, with identity development reflecting disease management habits and relationship building reflecting medical and nonmedical support systems. It is similarly important to provide anticipatory guidance for patients and families who are transitioning to a new environment. For many patients pursuing higher education, the first-time demand for independent health care coordination is an anxiety-provoking experience and potential threat to mental health and disease management. This is especially true in the face of new stressors such as changes to environment, academic and vocational demands, financial responsibilities, and logistical issues with accessing care. At the same time, these hurdles are also opportunities for increased empowerment, responsibility, and independence.

In the patient-HCP relationship, it is critical that clinicians approach conversations with empathy, particularly regarding the emotional consequences of allergy on a patient's ability and flexibility to engage socially. Good rapport, trust, and the use of shared decision making (which honors a patient's growing independence) are foundational in the formation of lasting patient-clinician partnerships. Positive allergy management habits are also affected by the “culture of wellness” of a patient's environment. Although the ideal

environment will promote healthy coping mechanisms, self-care, work-life integration, and peer support, HCPs should be prepared to inquire about these factors and address their possible absence. Finally, it is important that HCPs for this age group understand how and why patients use social media. An empathetic understanding of the value of social connectedness should be balanced with an awareness and discussion of misinformation risk. It is helpful for HCPs to be familiar with current use trends, discuss online resource use, and even establish their own social media presence as a source of valid, trustworthy information.

Overall, allergic disease management in adolescents and young adults is a “high-risk, high-reward” situation: these patients exist in a uniquely malleable and transformative psychosocial setting and, therefore, have the potential to establish lifelong habits and patterns of disease management. With awareness, anticipation, and proactive action, HCPs can better serve these patients, tipping the scales in favor of positive disease management habits, trusting relationships, and personal empowerment.

Disclosures

Dr Stukus is an Associate Editor for *Annals of Allergy, Asthma & Immunology*, is on the Board of Regents for the American College of Allergy, Asthma and Immunology, participates in research that has received funding from DBV Technologies, and is a consultant for ARS Pharmaceuticals. Dr Shaker is a member and co-chair of the Joint Task Force on Practice Parameters, serves on the editorial board of *The Journal of Allergy and Clinical Immunology In Practice*, is an associate editor of *Annals of Allergy, Asthma & Immunology*, serves on the board of directors of the American Academy of Allergy, Asthma & Immunology (views expressed are his own), and has participated in research that has received funding from DBV. Dr Herbert serves on the editorial board of *The Journal of Pediatric Psychology*. The remaining authors have no conflicts of interest to report.

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