

Accepted Manuscript

Peanut-free schools: What does it really mean, and are they necessary?

David R. Stukus, MD

PII: S0091-6749(17)30666-8

DOI: [10.1016/j.jaci.2017.03.037](https://doi.org/10.1016/j.jaci.2017.03.037)

Reference: YMAI 12762

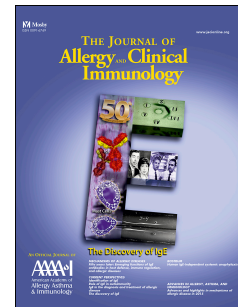
To appear in: *Journal of Allergy and Clinical Immunology*

Received Date: 20 March 2017

Accepted Date: 30 March 2017

Please cite this article as: Stukus DR, Peanut-free schools: What does it really mean, and are they necessary?, *Journal of Allergy and Clinical Immunology* (2017), doi: 10.1016/j.jaci.2017.03.037.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



TITLE PAGE

Title: Peanut-free schools: What does it really mean, and are they necessary?

Author: David R. Stukus, MD¹

Affiliations: ¹Division of Allergy and Immunology, Nationwide Children's Hospital and The Ohio State University College of Medicine, Columbus, OH

Corresponding Author: David R. Stukus, MD, Division of Allergy and Immunology, Nationwide Children's Hospital, 700 Children's Drive, Columbus, OH 43205, Telephone: 614 722-4808, Fax: 614 722-4342, david.stukus@nationwidechildrens.org

Funding: No funding was provided for this manuscript.

KEY WORDS: peanut allergy; food allergy; anaphylaxis; school; epinephrine

ABBREVIATIONS:

CDC – Centers for Disease Control and Prevention

US – United States

Approximately 4-8% of children in the United States (U.S.) have at least one food allergy, including 1-2% allergic to peanut.¹ These rates have increased during the past two decades, for reasons not fully understood.² Current food allergy management entails strict avoidance of the food allergen along with immediate access to self-injectable epinephrine in case of accidental ingestion causing anaphylaxis.

Parents of children with food allergies must learn to communicate with caregivers, food handlers, and school personnel. They may be the only source of food allergy and anaphylaxis education that other adults receive. Caregivers of children with food allergy report lower quality of life, particularly due to stress from continuous avoidance measures and anxiety surrounding the potential for anaphylaxis.³ Sending a food allergic child to school under the watchful eye of other adults, including those potentially unfamiliar with identification and management of anaphylaxis, can increase stress for many parents.

In 2016, approximately 50.4 million U.S. children were enrolled in public schools, encompassing 13,491 school districts and 98,271 buildings.⁴ Conservative estimates place an average of 37 students with peanut allergy in each school district and 5 in each school building. Schools must now consider management of food allergy in the school setting as a priority. However, the knowledge and management strategies employed by schools are highly variable. In an effort to raise awareness and provide evidence-based recommendations, the Centers for Disease Control and Prevention (CDC), in consultation with the U.S. Department of Education, developed voluntary guidelines for management of food allergies in schools, made publicly available in 2014.⁵

The CDC guidelines are not a mandatory training program and the extent of dissemination of these recommendations is unknown. This comprehensive document provides information directed towards administrators, nurses, teachers, and school personnel. The guidelines provide education regarding the recognition and management of anaphylaxis plus specific recommendations to mitigate risk of exposure within the school setting. However, one recommendation lacking from this document, as well as from any professional organization to date, is for the adoption of allergen-free schools.

Despite this, many schools have implemented self-imposed peanut-free policies within their districts or buildings. The origins of this movement are unclear, as is the prevalence of such policies within U.S. schools. These policies are an effort to protect students with peanut allergies and reduce concern from their parents surrounding accidental ingestion. Unfortunately, there is a lack of evidence surrounding the benefit or harm from such policies.

Implementing broad policies that affect all students can be challenging, particularly in determining the best methods to minimize risk, while limiting inconvenience to those unaffected. In regards to peanut-free policies, this can be an emotional topic for parents of food-allergic children, as well as those without food allergies. A peanut-free policy may protect children from accidental peanut exposure. However, this does not protect students with other food allergies, and risks alienating these families. In addition, parents of non-allergic children have used social media and online forums to express displeasure over limitations on their children imposed by food-bans, including limiting their lunch choices or ability to bring food based treats for classroom celebrations.

The study by Bartnikas LM, et al⁶ in this issue of The Journal of Allergy and Clinical Immunology provides the first large dataset (2,223 schools and 1,116,667 students over a 5 year-period) exploring the impact of school peanut-free policies on clinical outcomes, namely epinephrine administration for treatment of anaphylaxis. This study demonstrated that peanut-free policies are highly variable among school districts, particularly in regards to specific measures put in place by the schools. The authors had access to a large Massachusetts database that utilized mandatory standardized reporting measures after use of epinephrine within each school. This enabled them to determine rates of epinephrine use, as well as suspected cause of reaction. Interestingly, they identified higher rates of epinephrine use in schools with peanut-free policies compared to schools without. The only strategy that appeared to be associated with lower rates of epinephrine use across all ages was inclusion of a peanut-free table in the cafeteria. Middle/high schools with peanut-free classrooms also had lower epinephrine administration rates.

Limitations of this study include the reliance on survey data from school nurses and 55% response rate. It is possible that some of the reported causes of reactions were not accurately identified or due to peanut/tree nut exposure. In addition, the questionnaire identifies the location where epinephrine was administered, but not where allergen exposure occurred. Strengths of this study include the large dataset and access to nurses who use a mandatory standardized reporting system.

Why would schools with peanut-free policies have higher rates of epinephrine administration? This will require additional studies to better understand, but some possible explanations exist. In order for schools to truly become peanut-free, this would require inspection of every snack, lunch, or bag brought into the school by every student, every day. While letters to parents and

reminders may help reduce the presence of peanut inside the school, some may inadvertently send these foods to school. It is also possible that less stringent avoidance strategies may be applied due to a false sense of security if a peanut-free policy is in place.

Ideally, data from prospective randomized studies will provide the best strategies to implement inside schools to mitigate risk of reaction, but this will be challenging and are currently non-existent. Prior studies have identified a need to address food allergy management within schools. Gupta RS et al identified that only half of students with food allergy attending Chicago public schools had a current food allergy management plan on file.⁷ Survey data of schools receiving free epinephrine autoinjectors revealed that 9.6% of schools that responded had at least one event prompting use of epinephrine during the 2013-14 school year.⁸ Details regarding exact cause were unavailable, but food allergens were listed as the cause in 62% of anaphylactic events.

Instead of focusing on allergen-free policies, perhaps efforts should focus on increasing awareness and education of school personnel and creation of mandatory standardized reporting mechanisms to better manage food allergies in the school setting.

As experts in food allergy and anaphylaxis, allergists are in a position to assist both families and schools in understanding the challenges surrounding food allergy management.⁹ Prior to each school year, a food allergy treatment plan should be updated and shared with the school. Parents should receive anticipatory guidance specific to their child's age and developmental level. They should be educated regarding both high and low risk situations to help provide a realistic understanding of risks involved in various situations and focus efforts accordingly. Lastly, should it be necessary, allergists can help parents navigate the challenges of requesting and completing a 504 plan for their child.

As for schools, implementation of school wide policies should be determined on an individual basis. The number of buildings, physical layout, daily schedule, capacity of school personnel to recognize and treat anaphylaxis, and availability of full time school nursing are some of the factors that need to be considered by school administrators when considering a peanut-free policy. Accommodations in one school may not be possible or necessary in another school.

Bartnikas LM et al have provided valuable information for a topic lacking sufficient data to base recommendations. Until we have a better understanding of the benefits and risks entailed, it would be prudent for parents, schools, and physicians to strive towards improving awareness and education of the management of all food allergies in the school setting and focus less on specific allergen-free policies that may not be beneficial.

REFERENCES

1. Gupta RS, Springston EE, Warrier MR, Smith B, Kumar R, Pongracic J, et al. The prevalence, severity, and distribution of childhood food allergy in the United States. *Pediatrics*. 401 2011;128(1):e9-17.
2. Sicherer SH, Sampson HA. Food allergy. *J Allergy Clin Immunol*. 2010;125(2 Suppl 2):S116-25.
3. Warren CM, Otto AK, Walkner MM, Gupta RS. Quality of life among food allergic patients and their caregivers. *Curr Allergy Asthma Rep*. 2016;16(5):38.
4. NEA Research. Rankings of the states 2013 and estimates of school statistics 2014. Washington, DC: National Education Association; 2014. www.nea.org/assets/docs/NEA-Rankings-and-Estimates-2013-2014.pdf . Last accessed: March 17, 2017.
5. Centers for Disease Control and Prevention. Voluntary guidelines for managing food allergies in schools and early care and education programs. Washington, DC: US Department of Health and Human Services; 2013. www.cdc.gov/healthyschools/foodallergies/pdf/13_243135_a_food_allergy_web_508.pdf. Last accessed: March 17, 2017.
6. Bartnikas LM, Huffaker MF, Sheehan WJ , Kanchongkittiphon W, Petty CR, Leibowitz R, et al. Impact of school peanut-free policies on epinephrine administration. *J Allergy Clin Immunol*. 2017;
7. Gupta RS, Rivkina V, DeSantiago-Cardenas L, Smith B, Harvey-Gintoft B, Whyte SA. Asthma and food allergy management in Chicago public schools. *Pediatrics*. 2014;134(4):729-36.

- 134 8. White MV, Hogue SL, Bennett ME, Goss D, Millar K, Hollis K, et al. EpiPen4Schools pilot
135 survey: Occurrence of anaphylaxis, triggers, and epinephrine administration in a U.S. school
136 setting. *Allergy Asthma Proc.* 2015; 36(4):306-12.
- 137 9. Portnoy JM, Shroba J. Managing food allergies in schools. *Curr Allergy Asthma Rep.*
138 2014;14(10):467.