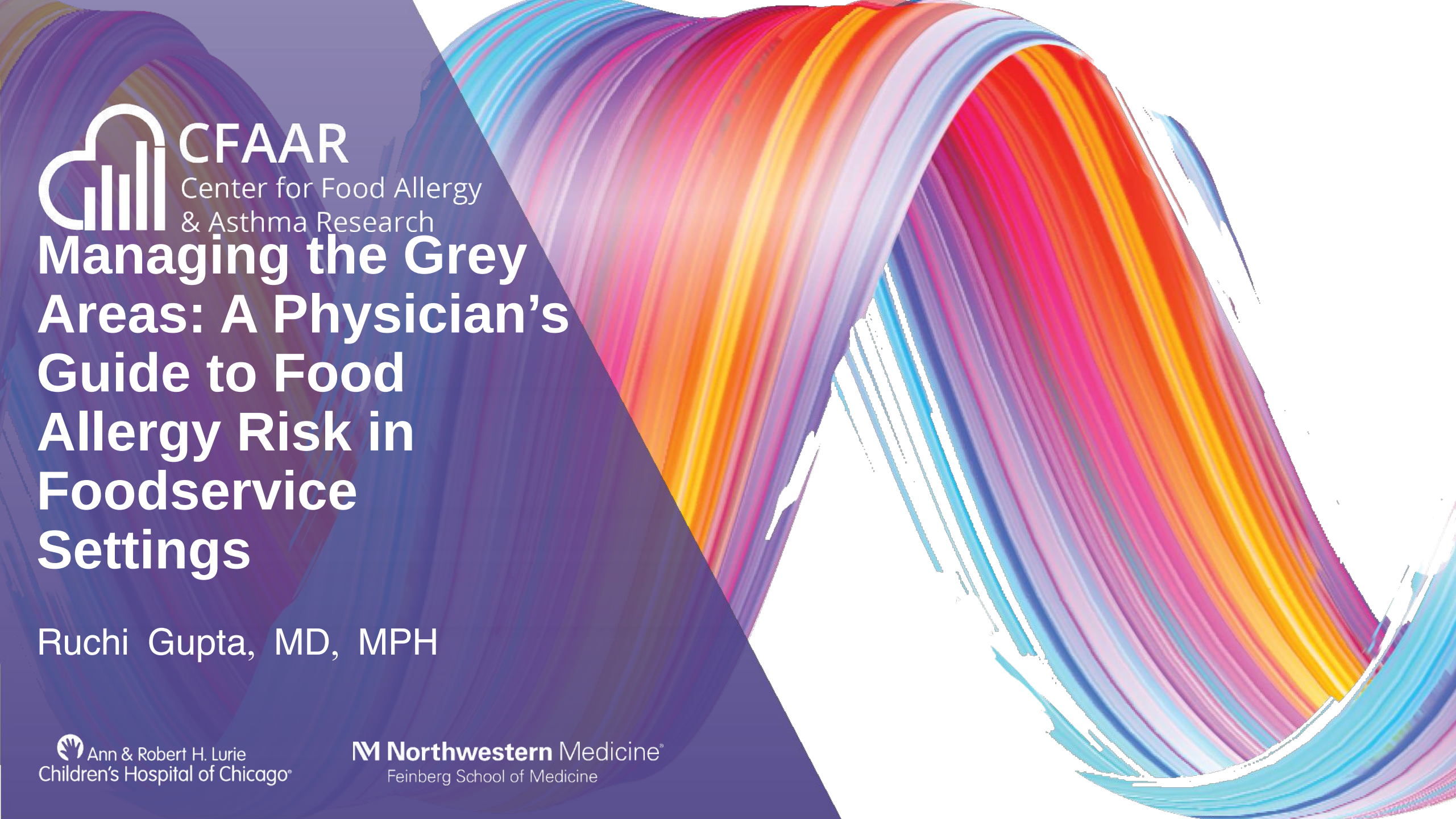



# Managing the Grey Areas: A Physician's Guide to Food Allergy Risk in Foodservice Settings

Ruchi Gupta, MD, MPH

Ann & Robert H. Lurie
Children's Hospital of Chicago

Northwestern Medicine
Feinberg School of Medicine

# Ruchi Gupta, MD, MPH

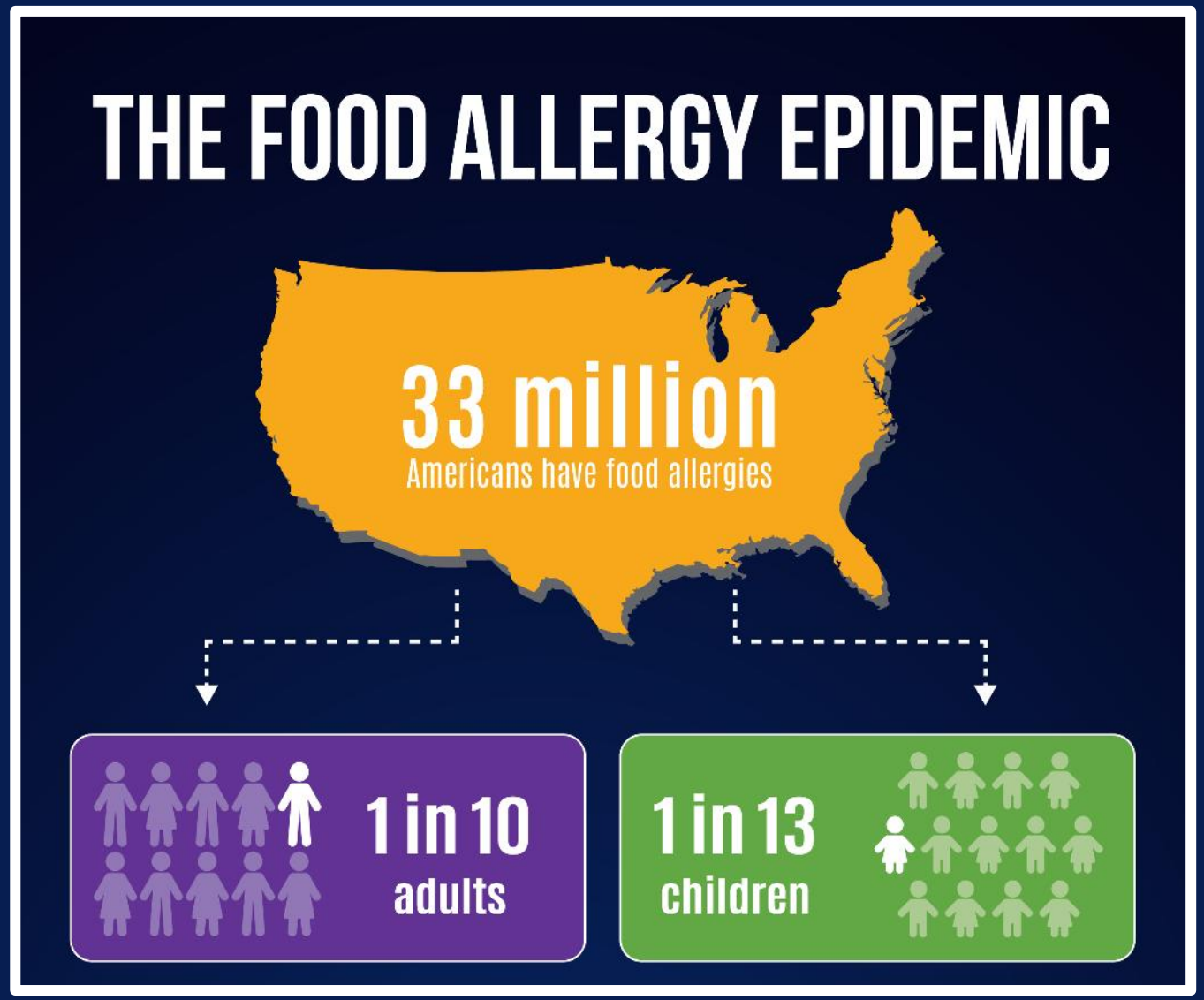
- Professor of Pediatrics & Medicine, Northwestern University
- Clinical Attending, Lurie Children's Hospital of Chicago
- Founding Director, Center for Food Allergy & Asthma Research (CFAAR)
- Founder, Yobee
- Author of *Food Without Fear*
- & *Baby's Skin Health*
- Mom of kids with eczema & allergies


CFAAR
Center for Food Allergy
& Asthma Research

# The Public Health Impact of Food Allergy in the U.S.

Ann & Robert H. Lurie
Children's Hospital of Chicago®

Northwestern Medicine®
Feinberg School of Medicine




## Reactions can range from...

**Mild** ⟷ **Life-threatening**

https://www.foodallergy.org/resources/facts-and-statistics

PEDIATRICS®
OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

# The Public Health Impact of Parent-Reported Childhood Food Allergies in the United States

Ruchi S. Gupta, MD, MPH,[a,b,c,d] Christopher M. Warren, BA,[e] Bridget M. Smith, PhD,[c,f] Jesse A. Blumenstock, BS,[c] Jialing Jiang, BA,[c] Matthew M. Davis, MD, MAPP,[a,b,c,d,g] Kari C. Nadeau, MD, PhD[h]

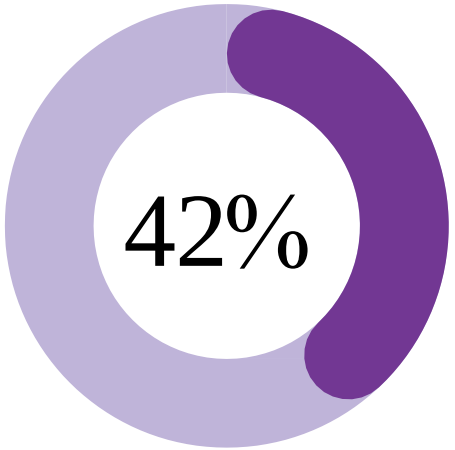
Gupta RS, Warren CM, Smith BM, Blumenstock JA, Jiang J, Davis MM, et al. The Public Health Impact of Parent-Reported Childhood Food Allergies in the United States. *Pediatrics.* 2018;142(6):e20181235.

# Childhood Food Allergy Prevalence in the U.S.

**8%** of US Children have a food allergy

~ 2 kids per classroom


are allergic to multiple foods




have experienced a severe reaction

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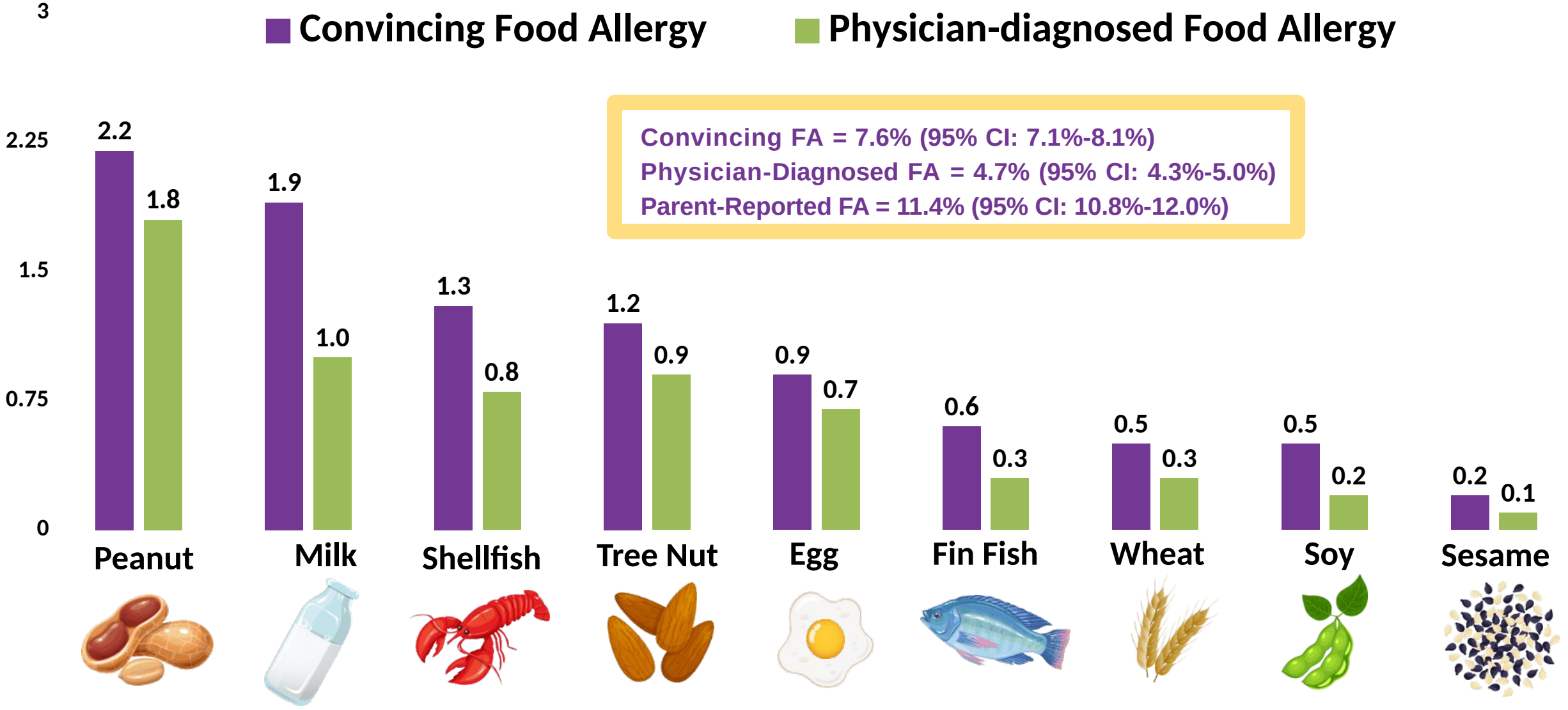
Gupta RS, Warren CM, Smith BM, Blumenstock JA, Jiang J, Davis MM, Nadeau KC. The Public Health Impact of Parent-Reported Childhood Food Allergies in the United States. Pediatrics 2018-1235

# Childhood Food Allergy Prevalence in the U.S.

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Gupta RS, Warren CM, Smith BM, Blumenstock JA, Jiang J, Davis MM, Nadeau KC. The Public Health Impact of Parent- Reported Childhood Food Allergies in the United States. Pediatrics 2018-1235

# Food Allergen Prevalence by Age

| | Peanut | Tree Nut | Milk | Shellfish | Egg | Fin Fish | Wheat | Soy | Sesame |
|---|---|---|---|---|---|---|---|---|---|
| <1 Year | 20.2% | 9.0% | 53.0% | 7.1% | 13.5% | 2.6% | 14.9% | 15.4% | 4.6% |
| 1 Y | 24.6% | 8.0% | 37.8% | 5.1% | 22.8% | 6.4% | 6.0% | 16.6% | 4.9% |
| 2 Y | 24.5% | 10.9% | 43.5% | 11.5% | 14.1% | 6.0% | 9.9% | 8.6% | 2.3% |
| 3-5 Y | 25.1% | 15.9% | 33.6% | 13.0% | 15.0% | 6.2% | 6.6% | 6.9% | 2.7% |
| 6-10 Y | 32.8% | 17.6% | 24.4% | 18.4% | 10.8% | 7.8% | 6.4% | 6.5% | 3.3% |
| 11-13 Y | 30.5% | 21.3% | 14.9% | 20.2% | 12.8% | 7.1% | 6.2% | 3.6% | 1.8% |
| >14 Y | 29.5% | 13.3% | 16.0% | 21.3% | 6.6% | 7.9% | 5.4% | 3.0% | 2.1% |

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Gupta RS, Warren CM, Smith BM, Blumenstock JA, Jiang J, Davis MM, Nadeau KC. The Public Health Impact of Parent-Reported Childhood Food Allergies in the United States. Pediatrics 2018-1235

# Patterns of Convincing Multi-Food Allergy Among US Children

| | Peanut | Tree Nut | Sesame | Milk | Egg | Fin Fish | Shellfish | Soy | Wheat |
|---|---|---|---|---|---|---|---|---|---|
| Peanut | 100 | 61 | 55 | 15 | 29 | 38 | 25 | 33 | 22 |
| Tree Nut | 33 | 100 | 44 | 9 | 18 | 24 | 14 | 24 | 18 |
| Sesame | 5 | 8 | 100 | 3 | 6 | 9 | 5 | 11 | 13 |
| Milk | 13 | 15 | 23 | 100 | 35 | 15 | 11 | 37 | 43 |
| Egg | 12 | 13 | 26 | 17 | 100 | 20 | 11 | 25 | 21 |
| Fin Fish | 9 | 11 | 23 | 4 | 12 | 100 | 24 | 14 | 12 |
| Shellfish | 15 | 15 | 31 | 7 | 16 | 57 | 100 | 20 | 21 |
| Soy | 7 | 10 | 26 | 9 | 13 | 12 | 7 | 100 | 26 |
| Wheat | 5 | 8 | 31 | 11 | 12 | 11 | 8 | 27 | 100 |

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Center for Food Allergy & Asthma Research

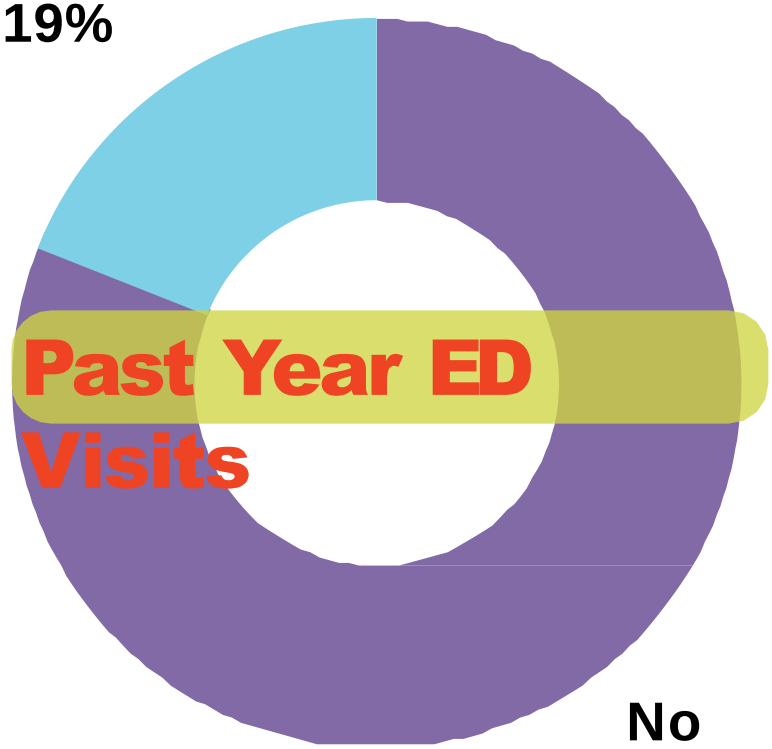
Warren CM, Aktas ON, Manalo LJ, Bartell TR, Gupta RS. The epidemiology of multifood allergy in the United States: A population-based study. Annals of Allergy, Asthma & Immunology. 2023 May 1;130(5):637-48.

# Pediatric FA Emergency Department Visits

1+ Visit
42%


No
Visits
58%

1+ Visit
19%




No
Visits
81%

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Gupta RS, Warren CM, Smith BM, Blumenstock JA, Jiang J, Davis MM, Nadeau KC. The Public Health Impact of Parent- Reported Childhood Food Allergies in the United States. Pediatrics 2018-1235

# Pediatric Atopic Comorbidities

Rates of physician-diagnosed atopic conditions were **significantly higher among children with convincing FA** compared with other children

| Physician Diagnosed Comorbid Conditions | All Children | Children with FA | P-Value |
|---|---|---|---|
| **Asthma** | 12.2 (11.4–13.0) | **32.6 (29.5–35.9)*** | <.001* |
| **Atopic Dermatitis** | 5.9 (5.3–6.5)* | **14.9 (12.5–17.7)*** | <.001* |
| **Eosinophilic Esophagitis (EoE)** | 0.2 (0.10-0.2)* | **0.7 (0.4–1.1)*** | <.001* |
| **Allergic Rhinitis** | 12.8 (12.0–13.6)* | **30.4 (27.6–33.4)*** | <.001* |
| **Other Chronic Condition** | 4.2 (3.7–4.7)* | **10.1 (8.2–12.3)*** | <.001* |

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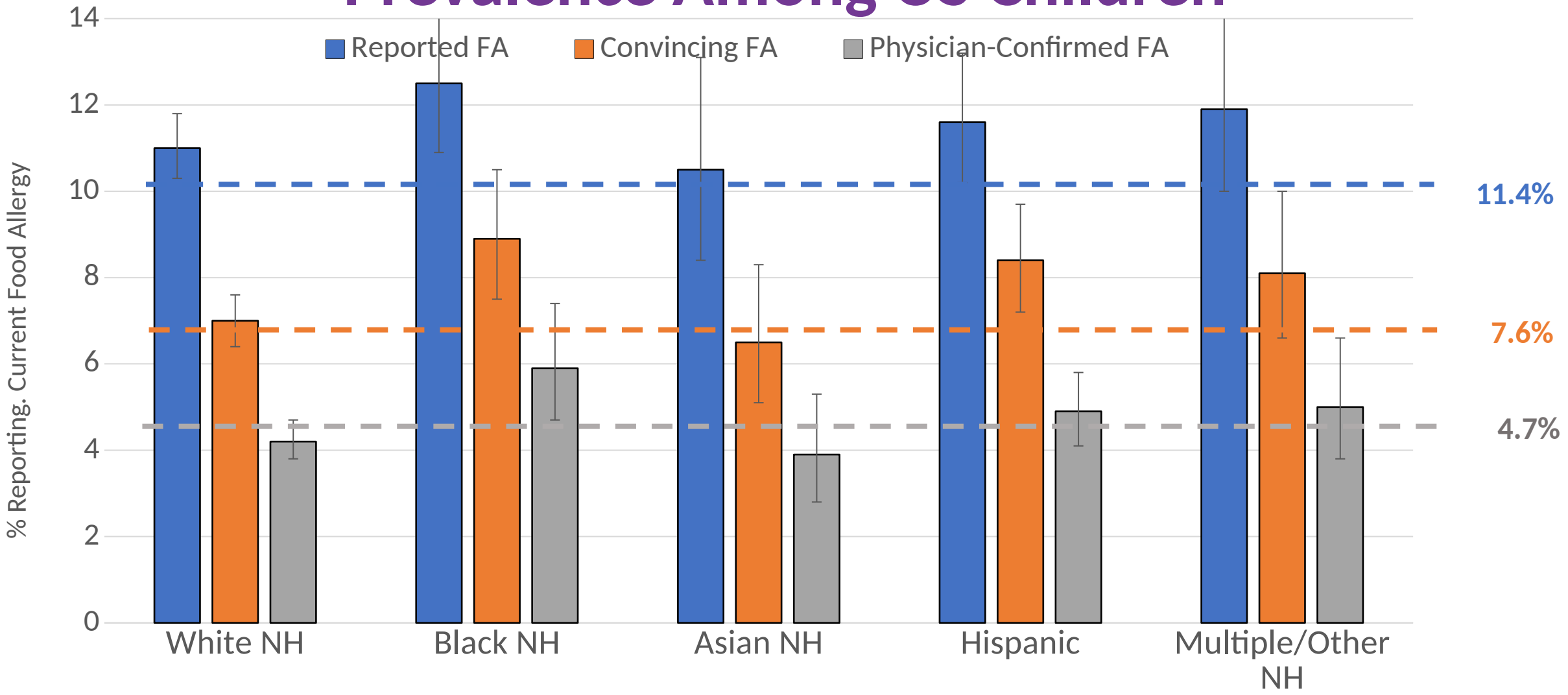
Gupta RS, Warren CM, Smith BM, Blumenstock JA, Jiang J, Davis MM, Nadeau KC. The Public Health Impact of Parent-Reported Childhood Food Allergies in the United States. Pediatrics 2018-1235

# Racial and Ethnic Differences in Food Allergy Prevalence Among US Children

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Gupta RS, Warren CM, Smith BM, Blumenstock JA, Jiang J, Davis MM, Nadeau KC. The Public Health Impact of Parent-Reported Childhood Food Allergies in the United States. Pediatrics 2018-1235

JAMA Network Open

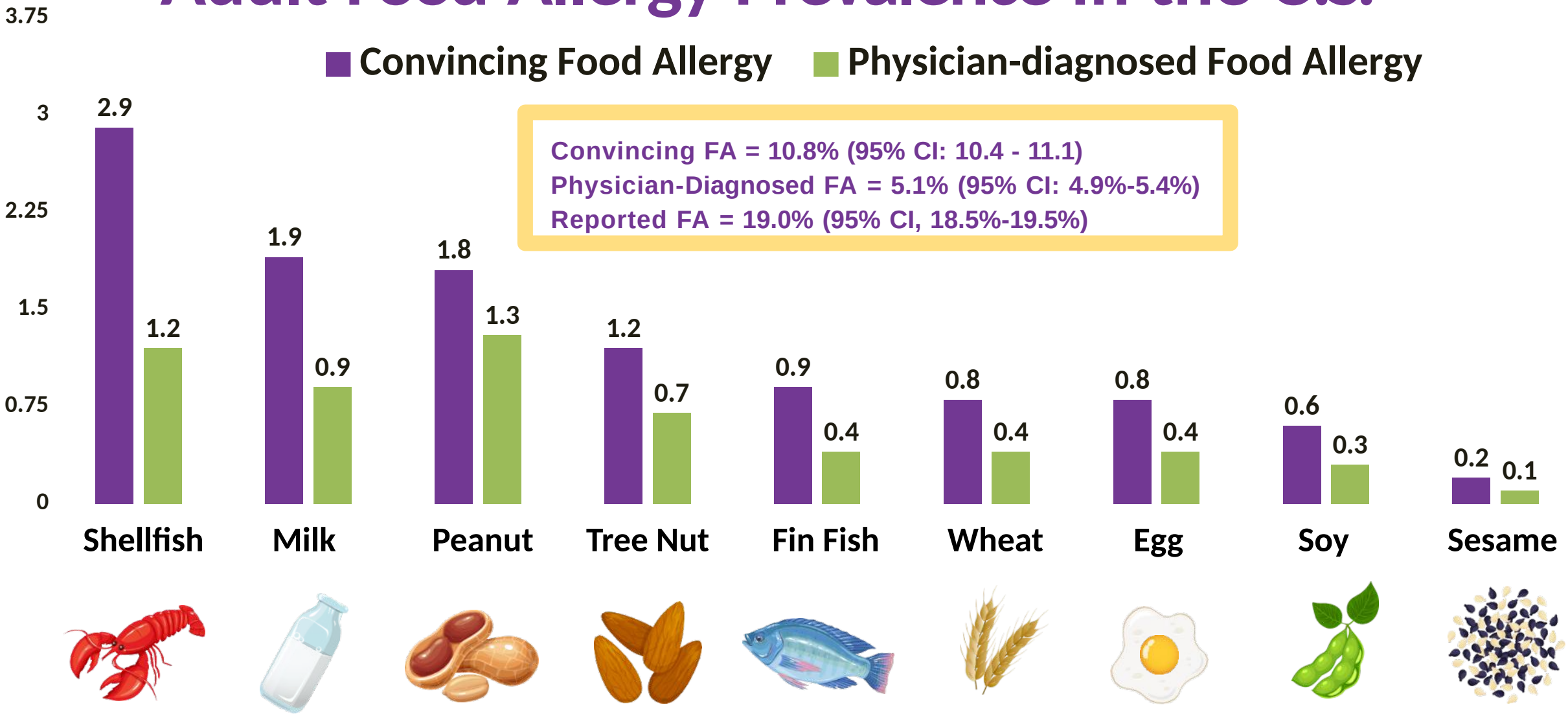
Original Investigation | Allergy

# Prevalence and Severity of Food Allergies Among US Adults

Ruchi S. Gupta, MD, MPH; Christopher M. Warren, BA; Bridget M. Smith, PhD; Jialing Jiang, BA; Jesse A. Blumenstock, BS; Matthew M. Davis, MD, MAPP; Robert P. Schleimer, PhD; Kari C. Nadeau, MD, PhD

Gupta RS, Warren CM, Smith BM, Jiang J, Blumenstock JA, Davis MM, et al. Prevalence and Severity of Food Allergies Among US Adults. *JAMA Network Open.* 2019;2(1):e185630-e185630.

# Adult Food Allergy Prevalence in the U.S.

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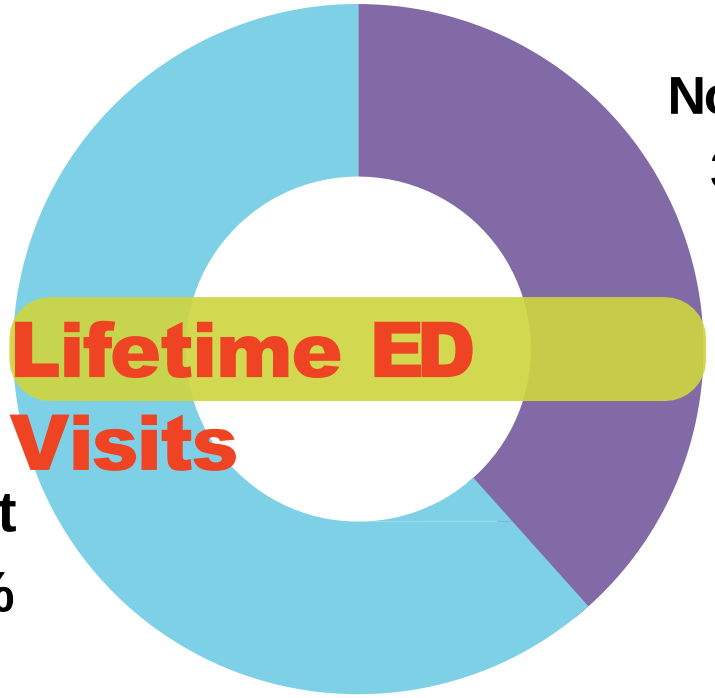
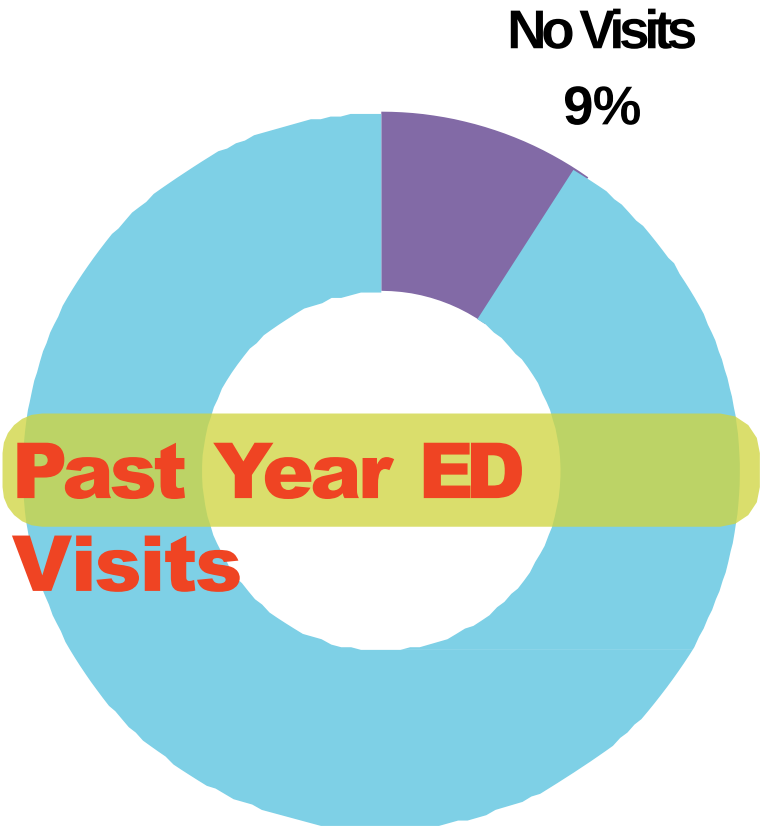
Gupta RS, Warren CM, Smith BM, Jiang J, Blumenstock JA, Davis MM, Schleimer RP, Nadeau KC. Prevalence and Severity of Food Allergies Among US Adults. JAMA Network Open. 2019;2(1):e185630.

# Adult FA Emergency Department Visits

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Gupta RS, Warren CM, Smith BM, Jiang J, Blumenstock JA, Davis MM, Schleimer RP, Nadeau KC. Prevalence and Severity of Food Allergies Among US Adults. JAMA Network Open. 2019;2(1):e185630.

# Food Allergies in Adults

More than 10% of U.S. adults – or more than 26 million people – have a history of food allergy.

HEALTH | YOUR HEALTH

**Doctors Surprised by Scope of Adult-Onset Food Allergies**

New research shows nearly 11% of U.S. adults have food allergies, more than many expected, with shellfish most common among adult-onset ones

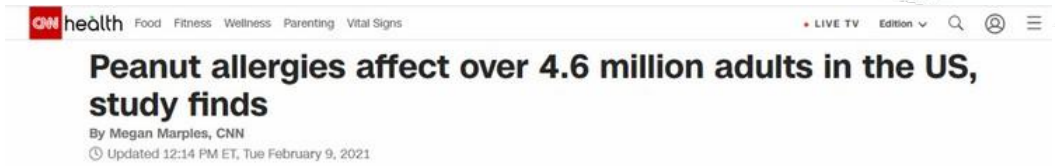
**More adults developing food allergies but many go undiagnosed**

More adults than children have food allergies and a new study suggests there's more to learn.

CNN Health » Food | Fitness | Wellness | Parenting | Live Longer

Live TV U.S. Edition

**More than 1 in 10 US adults has a food allergy, study finds**

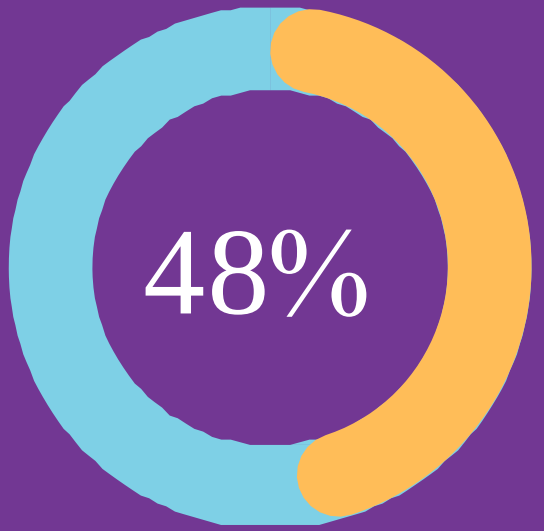


CNN health Food Fitness Wellness Parenting Vital Signs • LIVE TV Edition

**Peanut allergies affect over 4.6 million adults in the US, study finds**

By Megan Marples, CNN

Updated 12:14 PM ET, Tue February 9, 2021




**of food allergic-adults reported an adult onset food allergy**

**Nearly 1 in 5 Americans report they have had a severe reaction to food**

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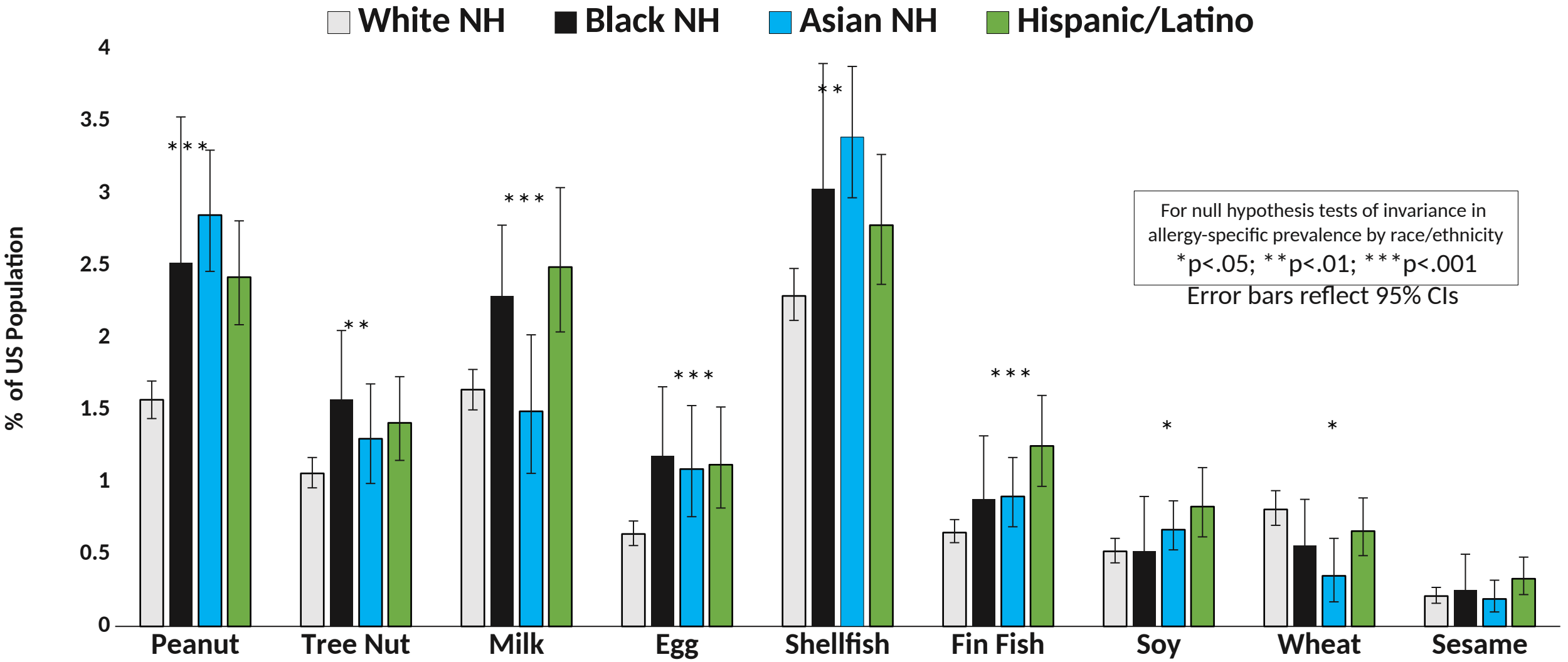
# Top Allergens by Race/Ethnicity




**Peanut, Milk, Shellfish, Finfish allergy are significantly higher among minority populations compared to White Americans**

Gupta RS, Warren CM, Smith B, Jiang J, Blumenstock J, Davis MM, Schleimer R, Nadeau K. Estimates of the Distribution, Determinants, and Severity of Food Allergies Among US Adults. *JAMA Network OPEN* 2019. Jan 4;2(1):e185630.

# Economic Impact of Food Allergies in the US

## Cross-sectional survey administered to 1,643 US caregivers of children with current food allergy

### Frequency of Allergic Events & Associated Costs:

**Medical**

- Hospitalizations
- ED visits

**Out-of-pocket**

- Special diets
- Changes in childcare or schools due to child's food allergy

**Lost labor productivity**

- Caregiver time spent attending medical visits for food allergic children

**Food allergy-related opportunity costs**

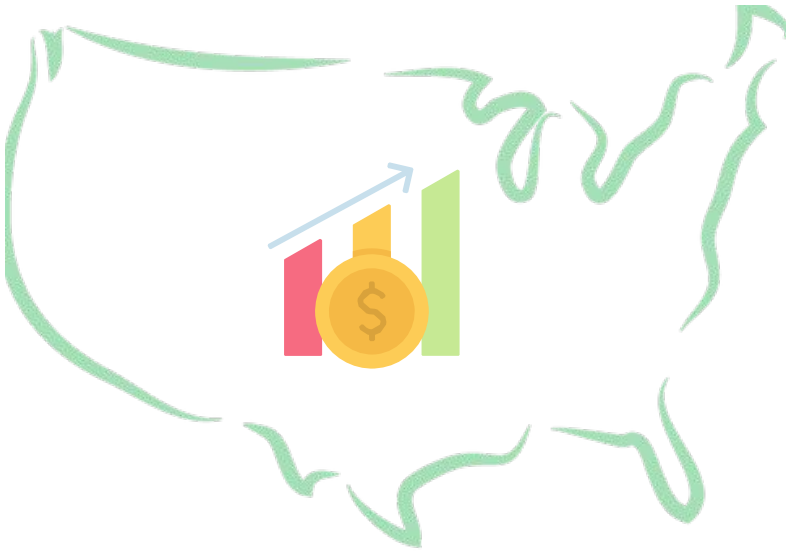
- Forgone labor market activities (e.g., job loss, part-time work)




Gupta R, Holdford D, Bilaver L, Dyer A, Holl JL, Meltzer D. The economic impact of childhood food allergy in the United States. JAMA pediatrics. 2013 Nov 1;167(11):1026-31.

# Economic Impact of Food Allergies in the US

## Overall Economic Cost



**$ 24.8 Billion**

## Direct Medical Costs

**$ 4.3 Billion**

## Family Cost

**$ 20.5 Billion**

***$4,184 per year/per child***

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Gupta R, Holdford D, Bilaver L, Dyer A, Holl JL, Meltzer D. The economic impact of childhood food allergy in the United States. JAMA pediatrics. 2013 Nov 1;167(11):1026-31.

# Out-of-Pocket Costs

| Variable | % Reporting Cost (SE) | Mean Direct Out-of-Pocket Costs, US$ (SE) | Cost Per Child, US$ | Overall Annual Cost (in Millions), US$ |
|---|---|---|---|---|
| Non-traditional medicine | 15 (1.6) | 123 (30) | 19 | 110 |
| Costs associated with special diets and allergen-free food | 37.7 (2.0) | 756 (59) | 285 | 1689 |
| Additional/change in child care | 6.7 (0.8) | 2158 (323) | 145 | 857 |
| Legal guidance | 2.3 (0.6) | 402 (122) | 9 | 55 |
| Counseling or mental health services | 4.5 (0.7) | 571 (123) | 26 | 152 |
| Special summer camp | 3 (0.7) | 702 (183) | 21 | 125 |
| A change in schools was needed due to food allergy | 4.2 (0.7) | 2611 (497) | 110 | 650 |
| Other expenses (e.g., cleaning supplies) | 9.5 (1.1) | 396 (86) | 36 | 216 |
| Any out-of-pocket costs | 74.3 (2.1) | 1252 (90) | 931 | 5516 |

Out-of-pocket costs: medical costs borne by patient associated with the prevention, diagnosis, and treatment of food allergies. Includes all costs associated with protecting the child from exposure to allergens, including special child care arrangements. The out-of-pocket costs exclude the top 1% of reported costs in each category.



Gupta R, Holdford D, Bilaver L, Dyer A, Holl JL, Meltzer D. The economic impact of childhood food allergy in the United States. JAMA pediatrics. 2013 Nov 1;167(11):1026-31.

# Comparing WTP & Measure of Actual Cost

| Characteristic | Annual Costs, US$ | | | |
|---|---|---|---|---|
| | | | 95% CI | |
| | Total (in Billions) | Per Child | Total (in Billions) | Per Child |
| Willingness to Pay (WTP) | 20.8 | 3504 | (15.7-25.7) | (2652-4344) |
| Costs borne by families | | | | |
| Out-of-pocket treatment | 5.5 | 931 | (4.7-6.4) | (793-1080) |
| Lost labor productivity | 0.77 | 130 | (0.53-1.0) | (89-175) |
| Opportunity | 14.2 | 2399 | (10.5-18.4) | (1771-3104) |
| Total | | | | |
| Direct medical costs | 4.3 | 724 | (2.8-6.3) | (472-1063) |
| Reported costs borne by families | 20.5 | 3457 | (16.7-24.9) | (2816-4208) |
| Reported costs | 24.8 | 4184 | (20.6-29.4) | (3475-4960) |

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Gupta R, Holdford D, Bilaver L, Dyer A, Holl JL, Meltzer D. The economic impact of childhood food allergy in the United States. JAMA pediatrics. 2013 Nov 1;167(11):1026-31.

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& Asthma Research

# Translating Research into Safer Campus Dining Environments

Ann & Robert H. Lurie
Children's Hospital of Chicago®

Northwestern Medicine®
Feinberg School of Medicine

# Food Allergies in College

## Food allergy impacts nearly all aspects of students' lives on campus

### Dorm Life/Social Events

### Dining on and Off Campus

### Attending Class/Games/Clubs

# Adolescents and Young Adults: Food Allergies and Daily Life

- **Adolescents and young adults with food allergy are more likely to engage in risk-taking behavior**
  - Don't always carry epinephrine auto-injectors
  - Less likely to speak up in restaurants and social settings to avoid talking about their allergies
  - Less likely to check food labels every time before trying foods

- **Individuals with FA experience highest levels of anxiety after initial diagnosis and following severe allergic reactions**

CFAAR Center for Food Allergy & Asthma Research

Warren CM, Dyer AA, Otto AK, Smith BM, Kauke K, Dinakar C, Gupta RS. Food Allergy-Related Risk-Taking and Management Behaviors Among Adolescents and Young Adults. J Allergy Clin Immunol Pract. 2017 Mar-Apr;5(2):381-390.e13. doi: 10.1016/j.jaip.2016.12.012. Epub 2017 Jan 27. PMID: 28132799.

# Food Allergies in College

- Nearly **10%** of college students were clinically diagnosed with at least one food allergy
- Fatal food-induced anaphylaxis is most common among the adolescent and young adult population
- Nearly **40%** of students did not consistently carry emergency medication

CFAAR Center for Food Allergy & Asthma Research


1. Hassan A, Alsaihati A, Al Shammari M, et al. Food allergy among university students: uncharted territory. Allergy Asthma Clin Immunol. 2020;16:17. Published 2020 Mar 4. doi:10.1186/s13223-020-0415-5

2.Warren CM, Dyer AA, Otto AK, Smith BM, Kauke K, Dinakar C, Gupta RS. Food Allergy-Related Risk-Taking and Management Behaviors Among Adolescents and Young Adults. J Allergy Clin Immunol Pract. 2017 Mar-Apr;5(2):381-390.e13. doi: 10.1016/j.jaip.2016.12.012. Epub 2017 Jan 27. PMID: 28132799.

3. Ersig AL, Williams JK. Student and Parent Perspectives on Severe Food Allergies at College. J Pediatr Health Care. 2018 Sep-Oct;32(5):445-454. doi: 10.1016/j.pedhc.2018.03.006. Epub 2018 Jun 12. PMID: 29903523.

Annals of Allergy, Asthma & Immunology®

# Determining avenues for improved food allergy support and safety on college campuses

Pranav M. Bajaj, BA*; Madeleine Kanaley, MPH*; Samantha Sansweet, MPH*; Kethan Bajaj, BA*; Julia Auerbach, BA*; Eirene Fithian, BA*; Khalid Ibrahim, MS*; Ruchi Gupta, MD, MPH*,†

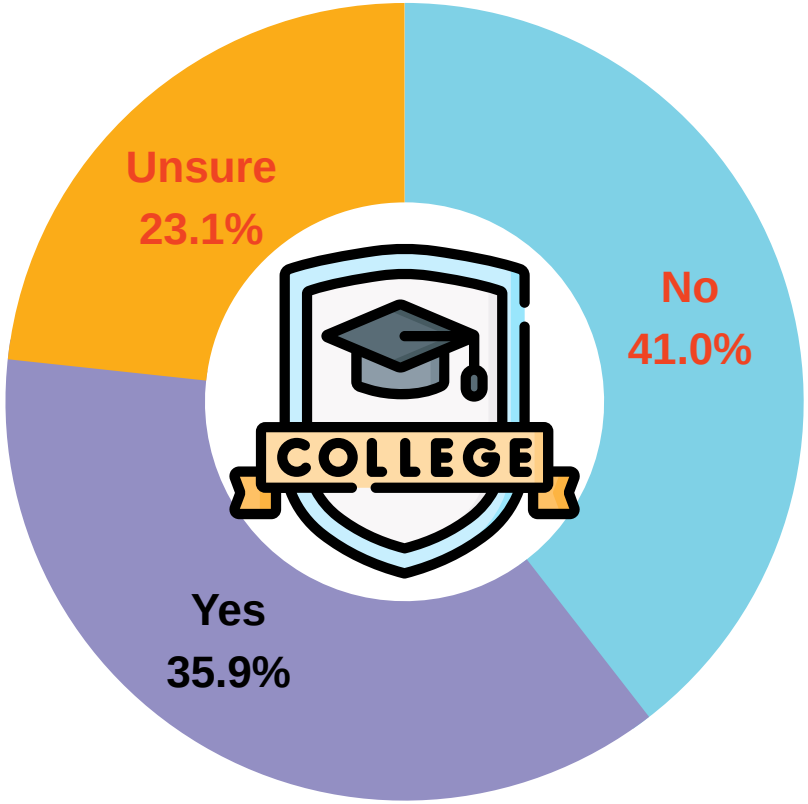
* *Center for Food Allergy and Asthma Research, Northwestern University Feinberg School of Medicine, Chicago, Illinois*
† *Division of Allergy and Immunology, Ann and Robert H. Lurie Children's Hospital of Chicago, Chicago, Illinois*

# College Study

- Online cross-sectional survey sent nationwide to college students
- **Aim:** To understand college-experience with FA and identify areas for improvement
- Completed by 204 students from 74 universities
  - 78 students reported FA

CFAAR Center for Food Allergy & Asthma Research

Bajaj PM, Kanaley M, Sansweet S, Bajaj K, Auerbach J, Fithian E, Ibrahim K, Gupta R. Determining avenues for improved food allergy support and safety on college campuses. Ann Allergy Asthma Immunol. 2025 Sep;135(3):297-302.e11. doi: 10.1016/j.anai.2025.06.005. Epub 2025 Jun 11. PubMed PMID: 40513819.




**Is the university aware of your food allergy?**

# University Awareness of Food Allergy is Low

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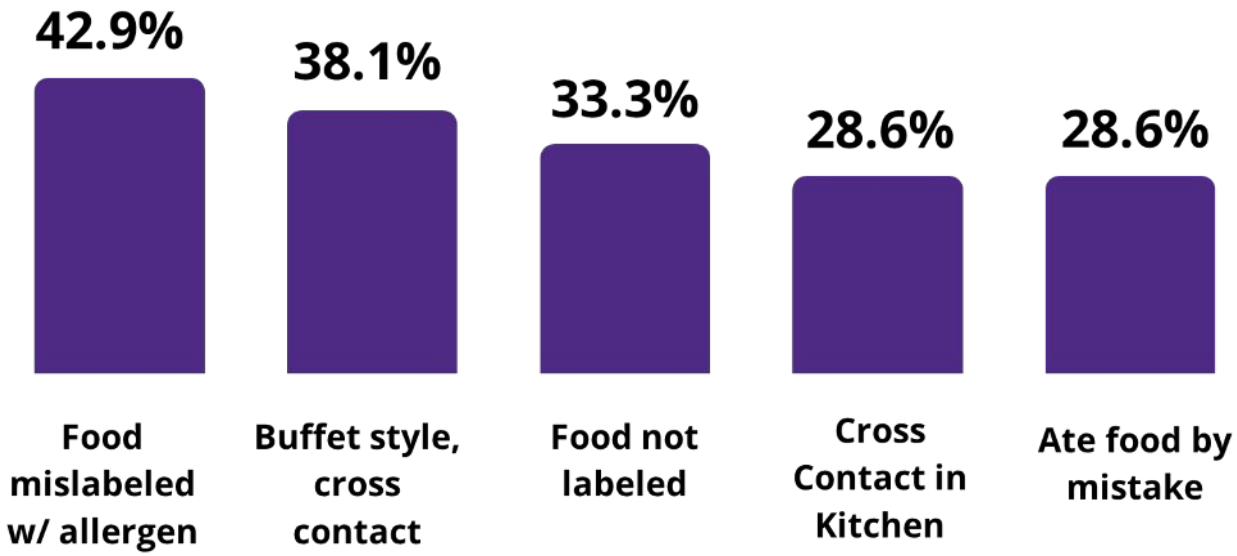
Bajaj PM, Kanaley M, Sansweet S, Bajaj K, Auerbach J, Fithian E, Ibrahim K, Gupta R. Determining avenues for improved food allergy support and safety on college campuses. Ann Allergy Asthma Immunol. 2025 Sep;135(3):297-302.e11. doi: 10.1016/j.anai.2025.06.005. Epub 2025 Jun 11. PubMed PMID: 40513819.


**of students have had an allergic reaction in the dining hall since starting college**

## Most Common Cause of Allergic Reactions in Dining Hall

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# Areas Impacted by Food Allergy

## What areas of your college life are impacted by food allergy?


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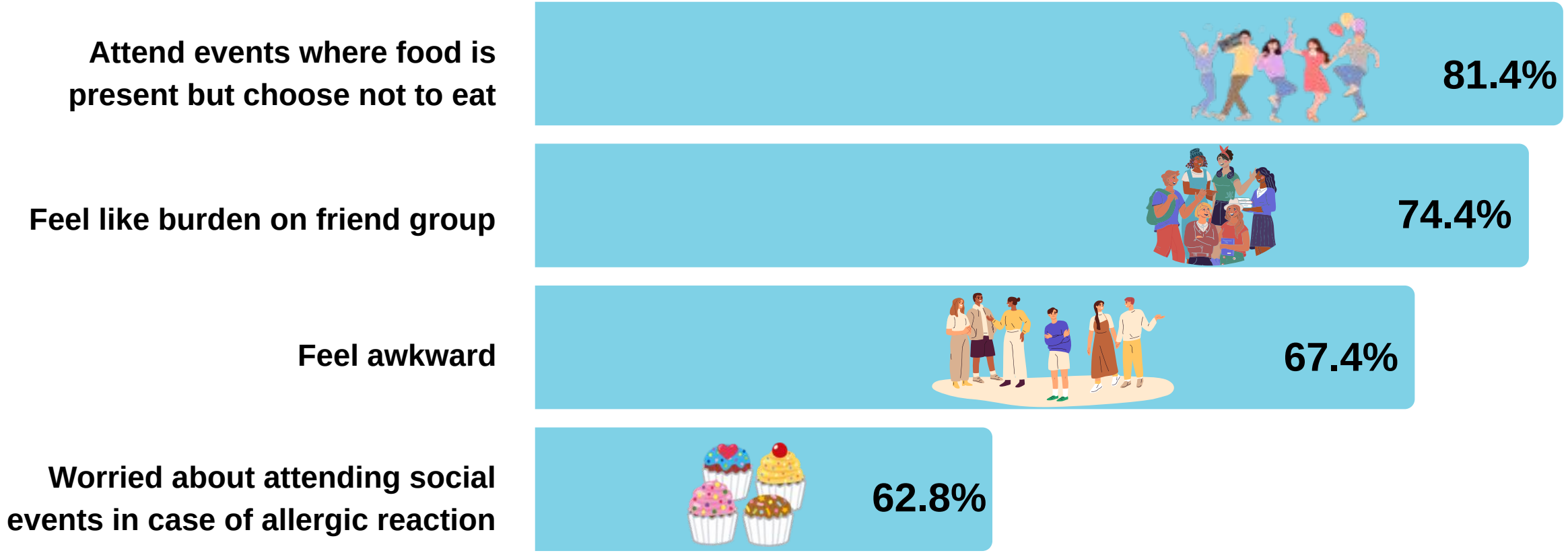
# Social Impacts

## How do you feel your FA impacts your social life?

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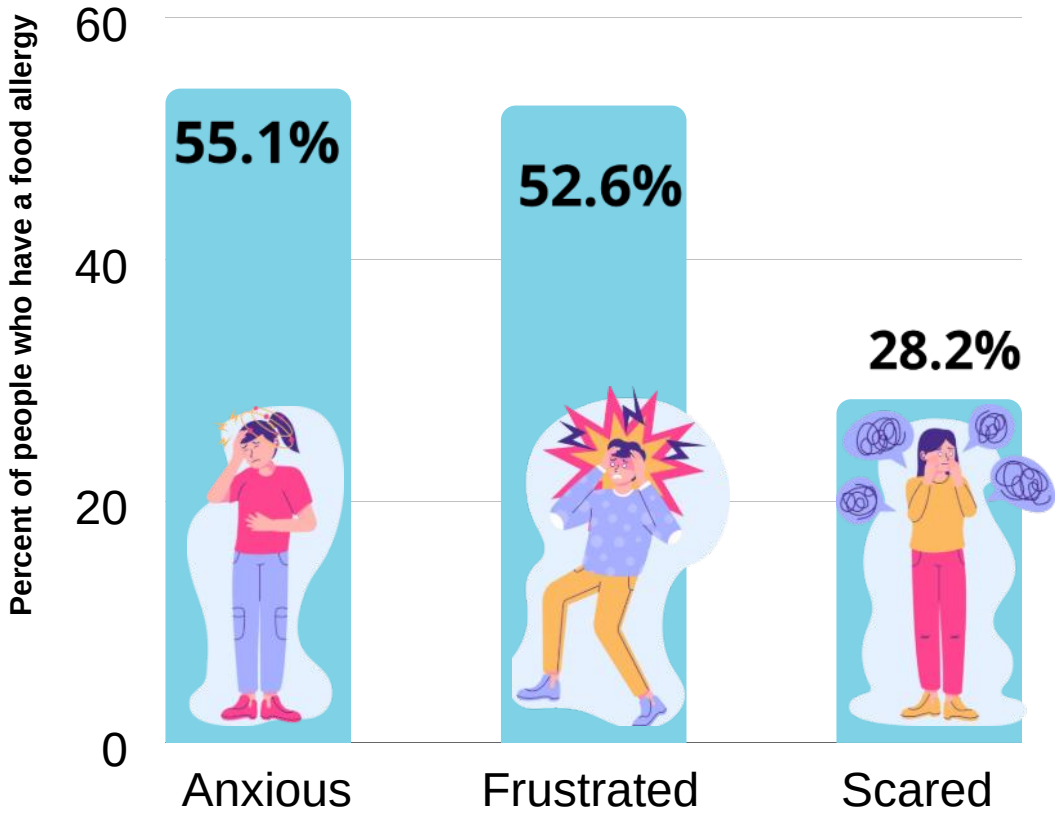
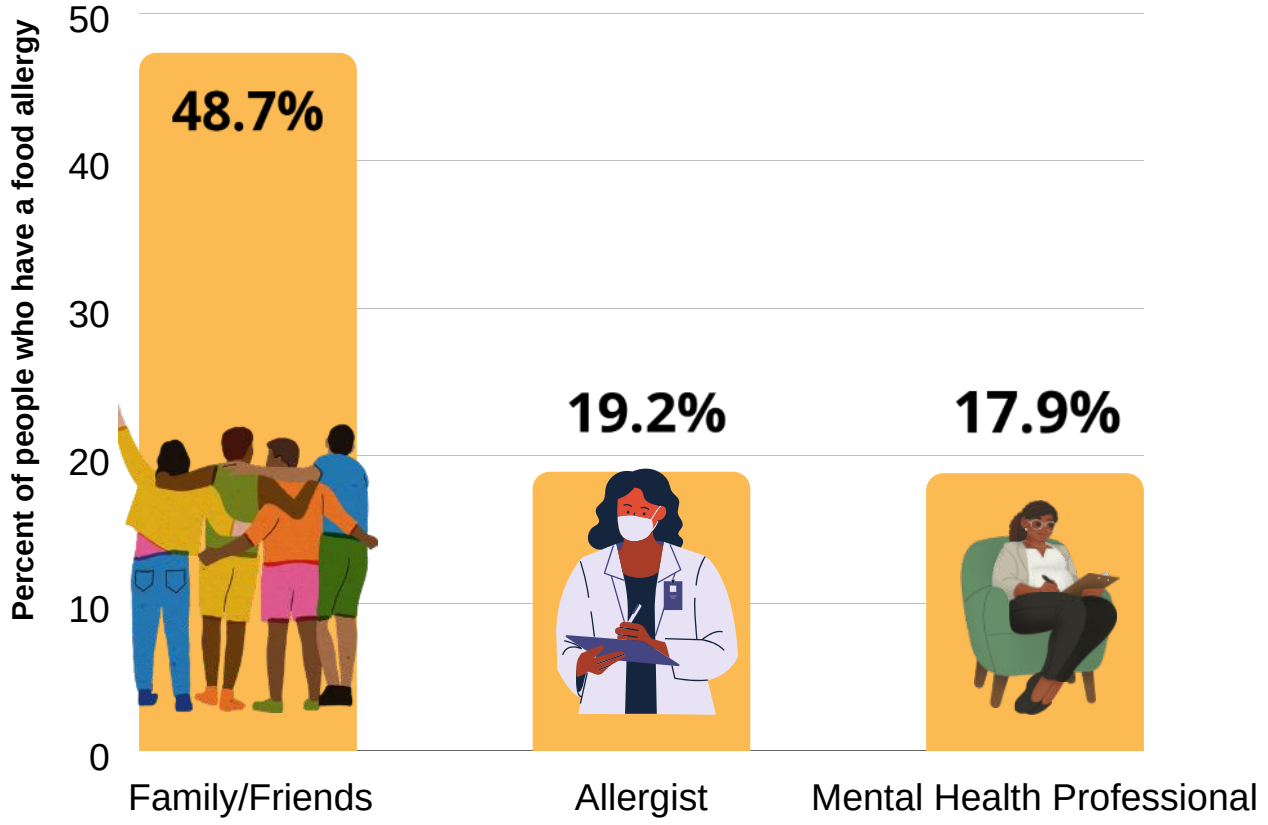
# Emotional Impacts

**50%** are more worried about their FA in college than they were in high school
**32.5%** have had an increase in allergic reactions since coming to college.

**How does having a food allergy make you feel?**




**Who do you go to for support?**

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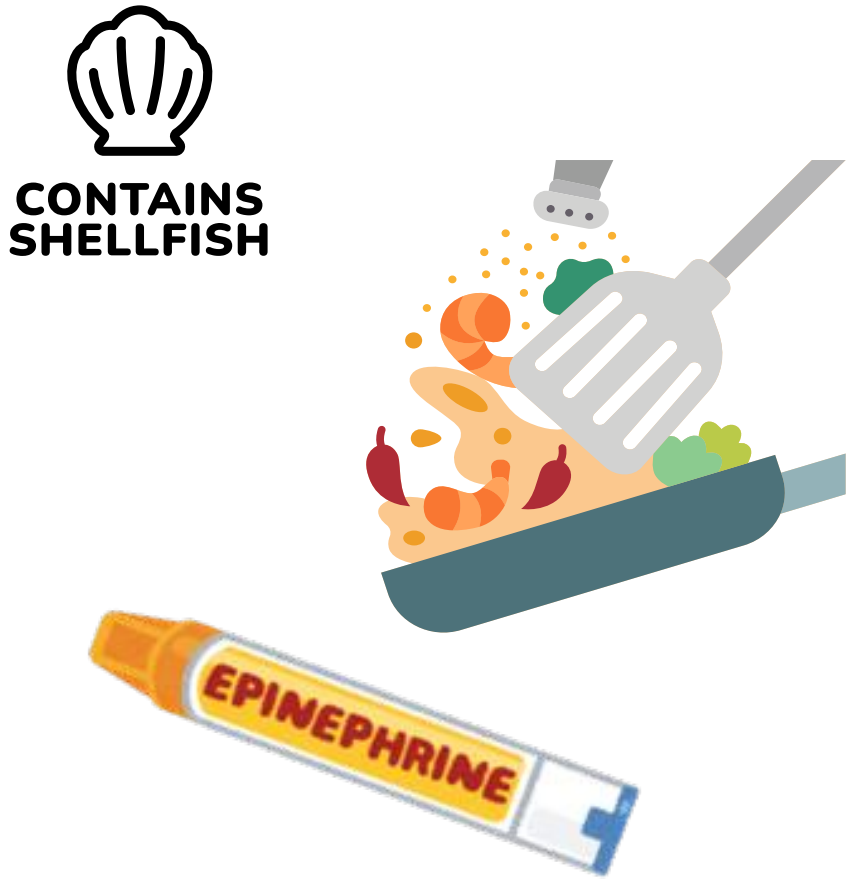
# What Students Want

## Best Ways for Dining Halls to Improve Safety

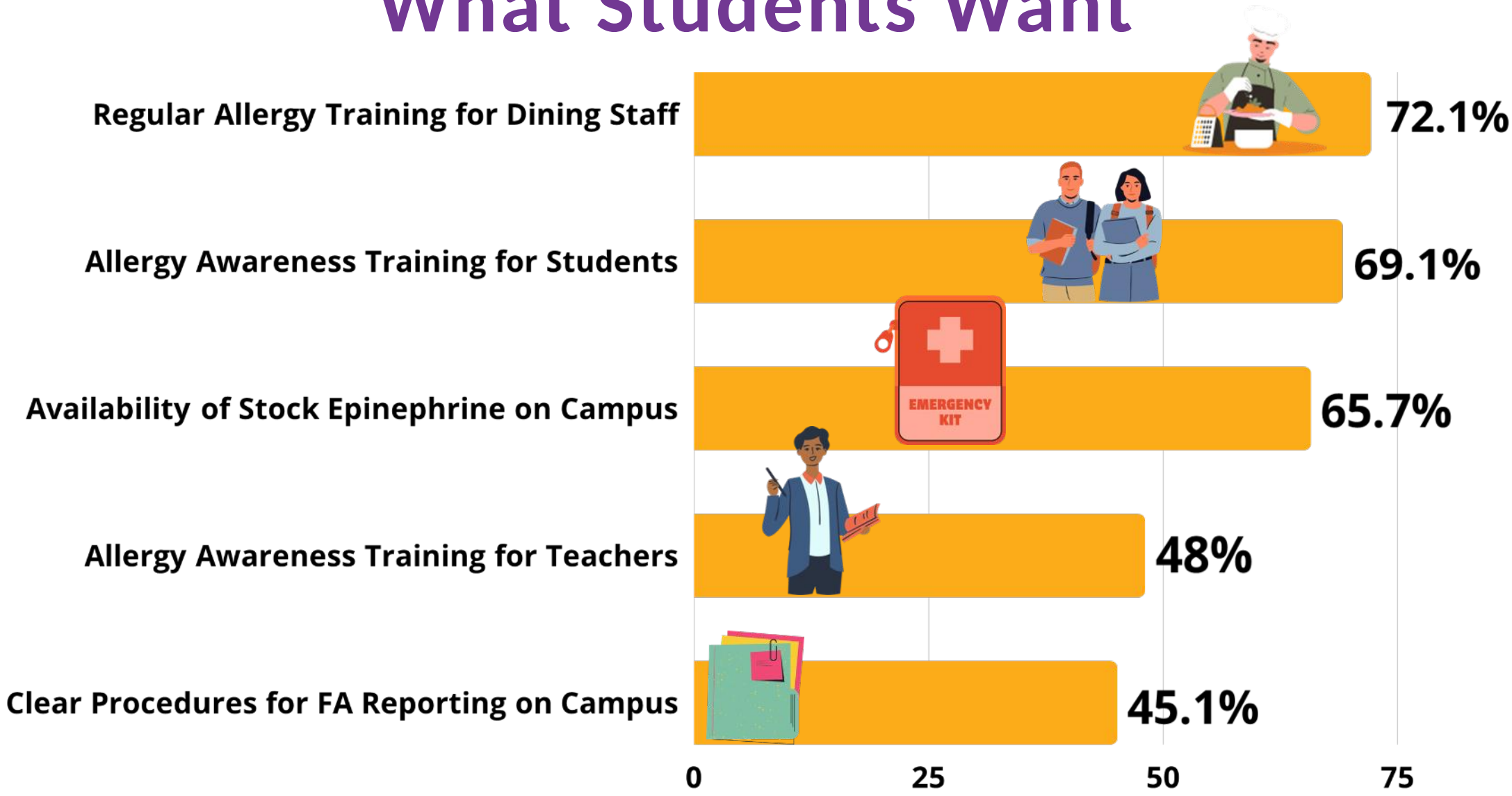
1. Better labeling system for foods
2. Clearer training procedures for dining staff
3. Dedicated allergen free food stations
4. Availability of stock epinephrine in dining halls




CFAAR Center for Food Allergy & Asthma Research

Bajaj PM, Kanaley M, Sansweet S, Bajaj K, Auerbach J, Fithian E, Ibrahim K, Gupta R. Determining avenues for improved food allergy support and safety on college campuses. Ann Allergy Asthma Immunol. 2025 Sep;135(3):297-302.e11. doi: 10.1016/j.anai.2025.06.005. Epub 2025 Jun 11. PubMed PMID: 40513819.

# What Students Want

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# College Study Conclusion

- Results suggest improvements in **food allergy awareness** and **training** for universities, students, and dining staff are necessary to improve quality of life for food-allergic students on campus

CFAAR Center for Food Allergy & Asthma Research

Bajaj PM, Kanaley M, Sansweet S, Bajaj K, Auerbach J, Fithian E, Ibrahim K, Gupta R. Determining avenues for improved food allergy support and safety on college campuses. Ann Allergy Asthma Immunol. 2025 Sep;135(3):297-302.e11. doi: 10.1016/j.anai.2025.06.005. Epub 2025 Jun 11. PubMed PMID: 40513819.

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# Navigating Overreporting, Underdiagnosis, and Misclassification on Campus

Ann & Robert H. Lurie
Children's Hospital of Chicago

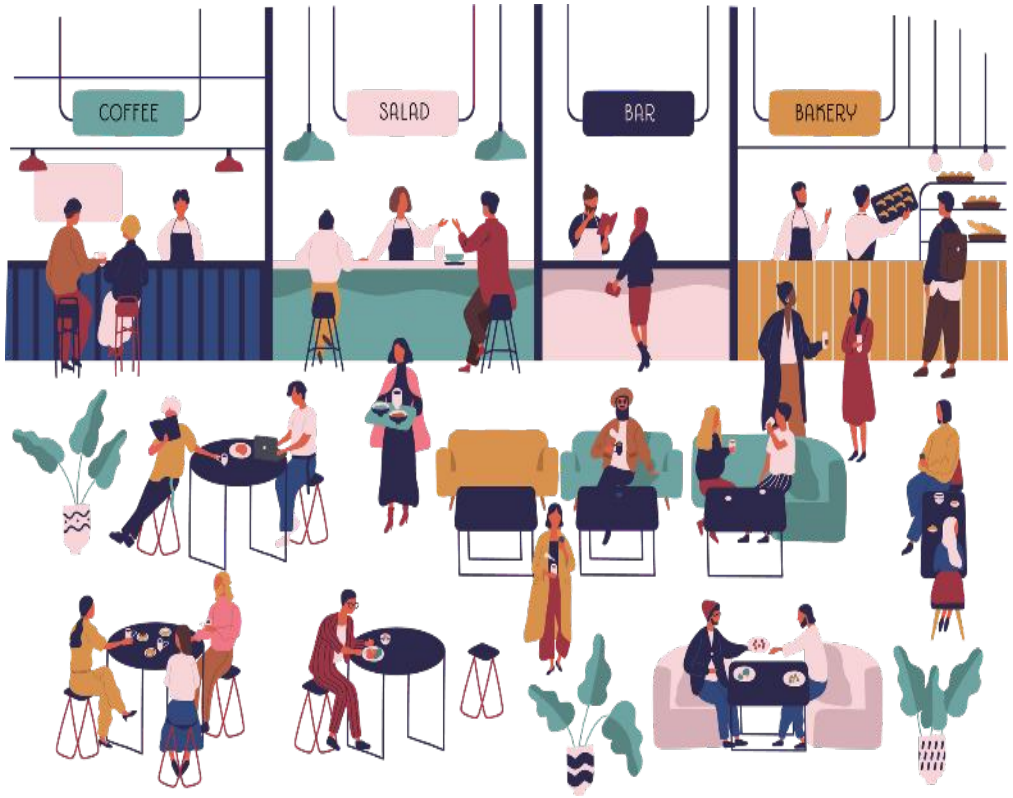
Northwestern Medicine
Feinberg School of Medicine

# Overreporting of Food Allergy

- True food allergy is often overreported without clinical confirmation

- Contributing factors:
  - Symptom misinterpretation
  - Positive testing without clinical reactivity
  - Confusion with food intolerance or other food conditions

- Students may be avoiding foods unnecessarily




CFAAR Center for Food Allergy & Asthma Research

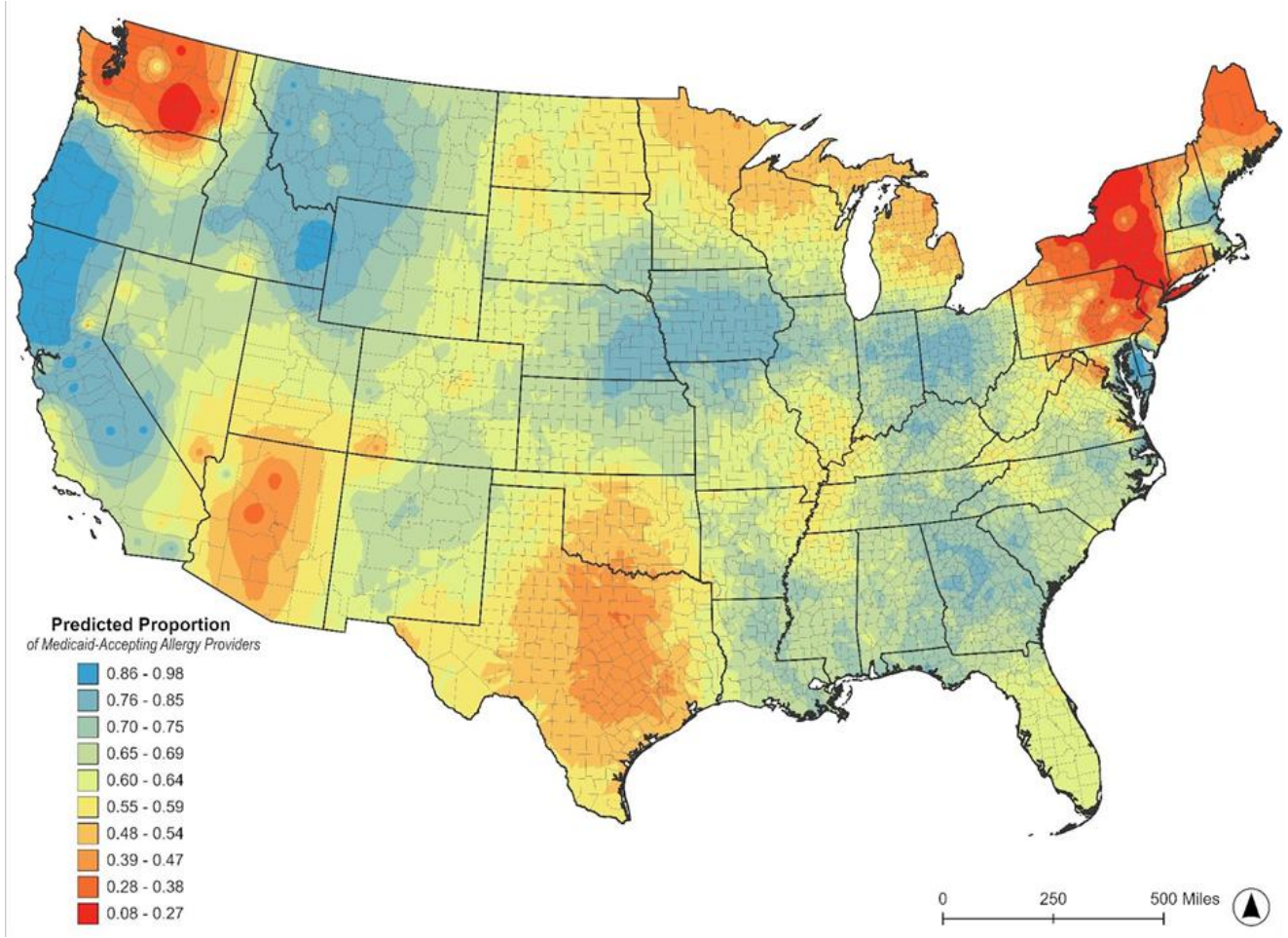
Yuan IH, Greenhawt M, Abrams EM, Kim EH, Mustafa SS, Iglesia EGA. Food allergies on a college campus. Ann Allergy Asthma Immunol. 2024 May;132(5):579-584. doi: 10.1016/j.anai.2024.01.023. Epub 2024 Jan 29. PMID: 38296046; PMCID: PMC11759065.

# Underdiagnosis of Food Allergy

- Limited number of allergists practicing in the United States
- Not all allergists treat pediatric patients
- The cost of care can be high and wait times can be long

# Disparities in Specialty Care

- **Only 55.5% of allergists accept Medicaid nationwide**

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Ho FO, Zheng C, Frazier M, Nimmagadda SR, Gupta RS, Bilaver LA. Geographic variability of Medicaid acceptance among allergists in the US. Am J Manag Care. 2024;30(8):374-379. doi:10.37765/ajmc.2024.89588

# Disparities in FA Diagnosis

Prevalence of FA diagnosis among Medicaid-enrolled US children is **substantially lower (0.6%)** compared to previous national estimates using parent surveys (7.6%) and reports of physician confirmation of food allergy (4.7%)

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1. Bilaver LA, Kanaley MK, Fierstein JL, Gupta RS. Prevalence and Correlates of Food Allergy Among Medicaid-Enrolled United States Children. *Acad Pediatr*. 2021;21(1):84-92. doi:10.1016/j.acap.2020.03.005
2. Gupta RS, Warren CM, Smith BM, Blumenstock JA, Jiang J, Davis MM, Nadeau KC. The Public Health Impact of Parent-Reported Childhood Food Allergies in the United States. Pediatrics 2018-1235

# Misclassification of Food Reactions

- Difficulty distinguishing between IgE-mediated FA, intolerance, and other conditions
- Some childhood allergies (IgE-mediated egg, milk, wheat, and soy) are outgrown
- Reaction thresholds can change over time and need reevaluation
- Misclassification can lead to:
  - Unnecessary dietary restrictions
  - Confusion in dining and labeling systems
  - Inadequate action plans

# Spectrum of Adverse Food Reactions

## Immediate

Anaphylaxis (multiple severe symptoms)
Impending doom
Hypotension/Shock
Dizziness/Light Headedness
Hives

Swelling (Angioedema)
Throat Swelling/Itchy mouth
Difficulty Breathing/cough
Nasal congestion/runny nose)
Vomiting
Diarrhea/cramping

## Delayed

Weight loss
Stomach cramping
Blood in stools
Anemia
Bloating
Diarrhea or Constipation

Delayed vomiting
Eczema
Rashes
Headaches
Irritability/Lethargy

**IgE-Mediated** ← **Mixed IgE and Non-IgE-Mediated** → **Non IgE-Mediated**

*Positive Skin Prick Test and Positive sIgE Blood Test*

*Variable Skin Prick Test and sIgE Blood Test Results*

*Negative Skin Prick Test and Negative sIgE Blood Test*

**Food Allergy***
Oral Allergy Syndrome / Pollen-Food Allergy Syndrome
Alpha-Gal Syndrome*

Atopic Dermatitis **(Eczema)**
**Eosinophilic Esophagitis (EoE)**
Eosinophilic Gastrointestinal Disorders **(EGID)**

Celiac disease**
Food Protein-induced Enteropathy (FPE)
Food Protein-induced Enterocolitis Syndrome (FPIES)**
Food Protein-induced Allergic Proctocolitis (FPIAP)
Galactosemia
Heiner Syndrome (can lead to pneumonia)
Intolerances***
Food poisoning (e.g., Salmonella, scombroid poisoning)
IBS/FODMAP Intolerance
Allergic contact dermatitis
Auricular Temporal syndrome
Gustatory Rhinitis

* Can require emergency treatment of food-induced anaphylaxis (e.g. with epinephrine)
** Can require emergency treatment of hypovolemic shock or severe dehydration
*** includes intolerance to lactose, food additives, chemicals, salicylates, gluten- non Celiac)

***Food Without Fear***

## Allergies

- Food Allergy
- Pollen Food Allergy Syndrome (PFAS) / Oral Allergy Syndrome (OAS)
- Alpha-gal Syndrome
- Food-dependent Exercise-induced Anaphylaxis (FDEIA)

## Mixed Reactions

- Eosinophilic Esophagitis (EoE)
- Eosinophilic Gastrointestinal Disorders (EGID)
- Food Protein-Induced enterocolitis syndrome (FPIES)
- Atopic Dermatitis / Eczema

## Masqueraders

- Milk, gluten, and other food sensitivities
- Lactose intolerance
- Chemical sensitivities
- Intolerance to food additives, dyes, preservatives
- Intolerance to certain carbs
- Allergic contact dermatitis
- Gustatory rhinitis

## Other Masqueraders

- Gastrointestinal disorders (e.g, IBS, IBD)
- Celiac Disease
- Gastroesophageal Reflux Disease (GERD)
- Hiatal hernia
- Food poisoning
- Intestinal infections
- Food phobias/aversions
- Eating disorders

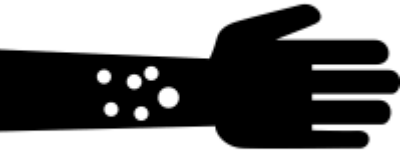
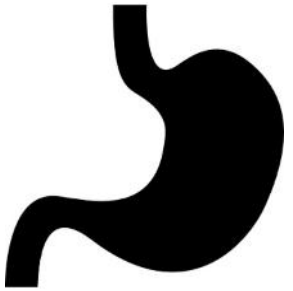
# An Overview of Clinical Testing/Retesting

- Personal and family history and reaction experiences are key to evaluating a food-related condition

- Reaction **timing** (minutes or hours), **symptoms**, **quantity** of food, **preparation** of food (raw vs. cooked vs. baked), **reproducibility** (food previously or subsequently tolerated?), **treatment** of reaction, and **co-factors** (exercise, fever, alcohol, medications)

- Over-testing is rampant - only test to confirm a likely history of reaction, not out of curiosity

# Food Allergy Symptoms

| Skin | Oral | Respiratory | GI | Cardiovascular | Neurological |
|---|---|---|---|---|---|
|  |  |  |  |  |  |
| • Urticaria<br>• Pruritus<br>• Flushing<br>• Angioedema | • Mouth Itching<br>• Throat closing<br>• Rash around mouth | • Cough<br>• Wheezing<br>• Dyspnea<br>• Laryngeal angioedema | • Nausea<br>• Emesis<br>• Diarrhea<br>• Abdominal cramping | • Hypotension<br>• Tachycardia<br>• Dizziness<br>• Syncope | • Confusion<br>• Headache<br>• Tunnel vision |

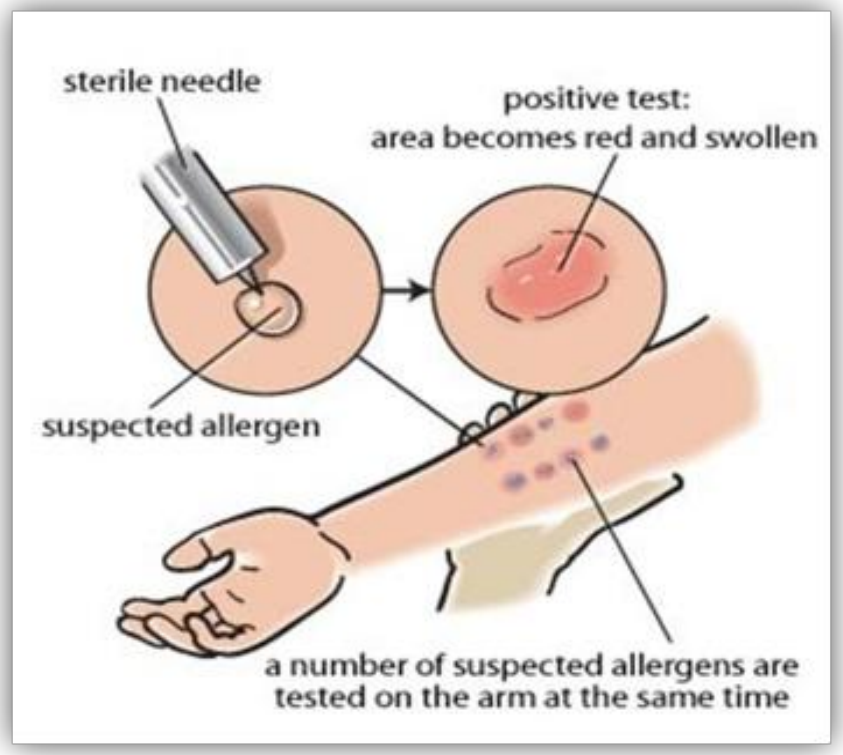
## Specific Diagnoses for following symptoms:

**Only GI Symptoms:** May be an intolerance, FPIES, Celiac Disease, Gluten Sensitivity

**Only Oral Symptoms:** May be Oral Allergy Syndrome/ Pollen Food Allergy Syndrome

# Skin Prick Testing (SPT)

- Assesses IgE bound to mast cell in skin
- Using a piece of plastic, skin is gently scratched or pricked with a drop of liquid that contains the food allergen
- Considered safe—0.008% reaction rate
- Only testing for suspected foods is useful
- Fast results (15-20 minutes)
- False positive rates are high





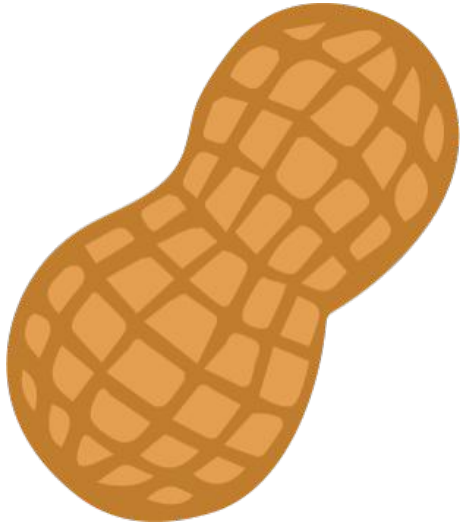

Sicherer and Sampson J Allergy Clin Immunol 2006; 117: S470-475
Sampson HA J Allergy Clin Immunol 2004; 113: 805-819
Metcalfe, DD, Sampson HA, Simon RA. Food Allergy: Adverse Reactions to Foods and Food Additives, 4th ed, Chapter 20

# Specific IgE Blood Test

- Measures allergen-specific IgE antibodies in blood for certain foods
- Sample sent to lab for testing
- Results typically available within a few days

# Component Testing

- Measures IgE to specific proteins ("components")
- Provides more detail on which part of the food may trigger a reaction (peanut proteins Ara h 1, 2, 3, 6, 8, 9)
- Component testing can add additional information to determine which patients are appropriate OFC candidates
- Many FA components are available. Not all are clinically helpful

# Elimination Diet


- The elimination diet generally lasts two to four weeks
- During this period, patient will avoid suspect foods while doctor monitors symptoms
- If one or more of the foods is causing an adverse reaction, symptoms should disappear by the end of this period
- This method, combined with skin or blood tests, can be helpful in diagnosing both IgE-mediated food allergies and other food conditions

# Oral Food Challenge – The Gold Standard

- Most definitive test to diagnose or rule-out food allergy
- Patient eats increasing amount of problematic food under medical supervision
- Used to determine if patient has outgrown a prior food allergy, or to confirm food allergy if diagnosis is in question
- **Should only be performed under supervision of a board-certified allergist with appropriate emergency medical treatment available**

# Approaching Students with Outdated or Unclear Diagnoses

### 1. Start with curiosity

- “Can you tell me about your allergy?”
- “When was the last time you were evaluated?”
- Many students have older or self-reported diagnoses

### 2. Listen for uncertainty or change

- “Has it changed over time?”
- Some allergies may be outgrown or unclear

### 3. Normalize reevaluation

- “A lot of students find their allergies change over time”

# Approaching Students with Outdated or Unclear Diagnoses

### 4. Introduce reevaluation gently

- “It might be helpful to check in with a physician or allergist again”

### 5. Emphasize benefits to the student

- Clarifying food options and action plans
- Less stress and uncertainty
- Improved quality of life

### 6. Keep it supportive and collaborative

- “Let’s make sure you have the most up-to-date information”

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# Strategies for Building Safe and Flexible Dining Programs

Ann & Robert H. Lurie
Children's Hospital of Chicago®

Northwestern Medicine®
Feinberg School of Medicine

# Practical Takeaways for Dining Professionals

- **Conduct ongoing allergen training:** Make it interactive and ensure all staff participate
- **Follow strict protocols:** Create a culture of consistency and follow recipes carefully
- **Be transparent:** Provide ingredient lists whenever possible (point of sale, online, etc)
- **Strive for inclusive dining:** Create an environment where every student feels they belong



*Slide courtesy of La Carlson, MS, RDN, LDN*

# Practical Takeaways for Dining Professionals

- **Make it personal:** Build one‑on‑one connections with students with food allergies; listen, show empathy, and support their independence
- **Provide a support system:** Encourage students and staff to speak up and self‑advocate; use QR codes and signage to help them navigate
- **Encourage advocacy groups:** Support campus or employee organizations—collective advocacy is powerful!
- **Share best practices:** Collaborate across teams and institutions to continually improve

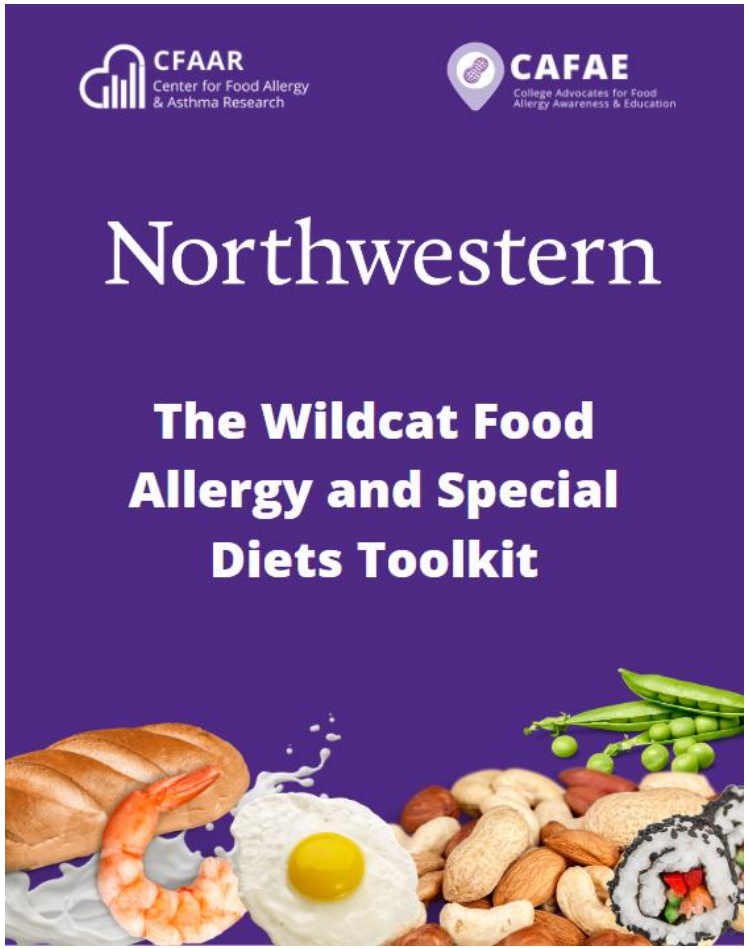


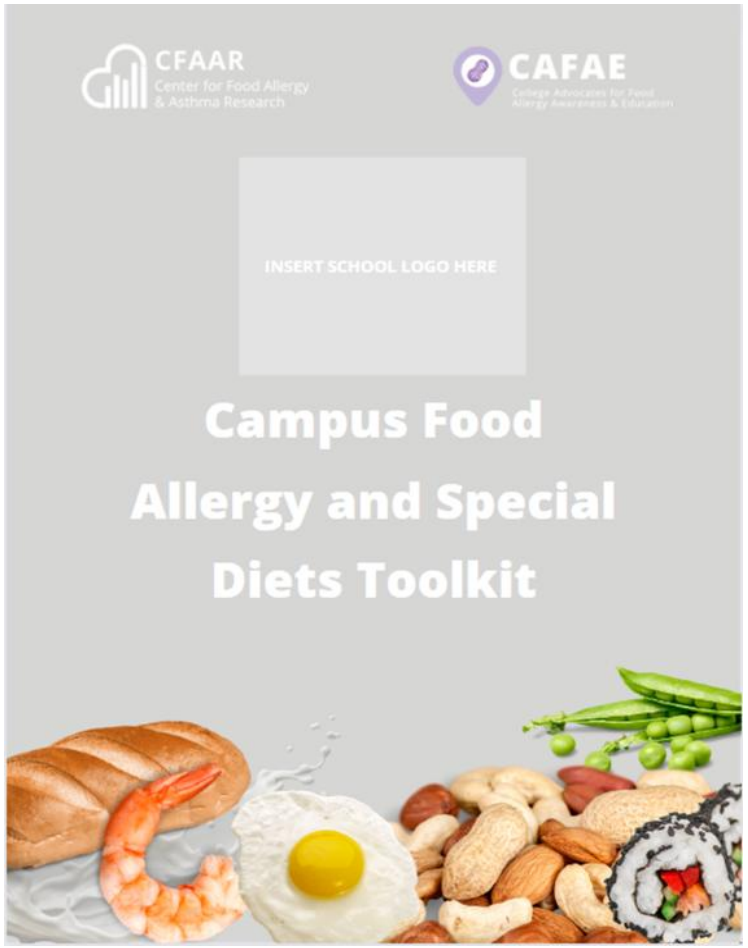
*Slide courtesy of La Carlson, MS, RDN, LDN*

# College Video: Northwestern University

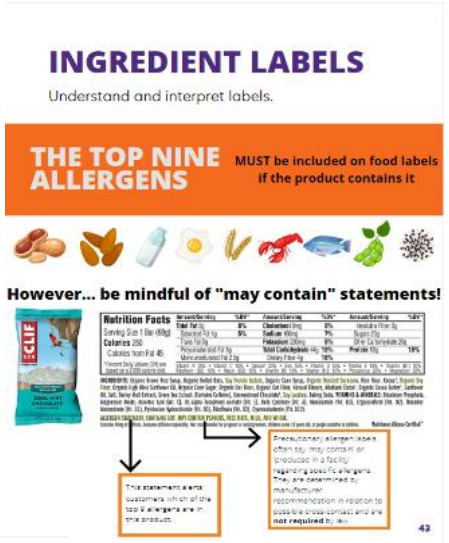
https://www.youtube.com/watch?v=NSoCM5635LA

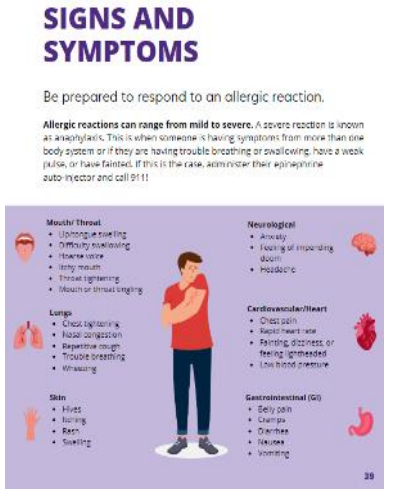
# Customizable College Orientation Toolkit








# College Advocates for Food Allergy Awareness & Education (CAFAE)

CAFAE

College Advocates for Food Allergy Awareness & Education

- A student organization dedicated to education, advocacy, and policy change on college campuses
- CAFAE empowers students with food allergies, ensuring they feel safe, supported, and included in college life
- Founded at Northwestern University by CFAAR student researchers, CAFAE plans to expand to campuses  nationwide

# CAFAE Chapters 2026

Northwestern University

UNIVERSITY OF MICHIGAN

UNE UNIVERSITY OF NEW ENGLAND

INNOVATION FOR A HEALTHIER PLANET

# CAFAE Key Initiatives: Food Allergy Education

**CAFAE teaches the campus community how to recognize anaphylaxis and use epinephrine auto-injectors**


# CAFAE Key Initiatives: Peer Dialogue

**CAFAE hosts open conversations where students share experiences, offer advice, and build a supportive network**


# CAFAE Key Initiatives: Policy Advocacy

**CAFAE collaborates with dining staff, school administration, and other students to push for more inclusive policies on campus**


Inclusion of stock epinephrine in dining halls on campus

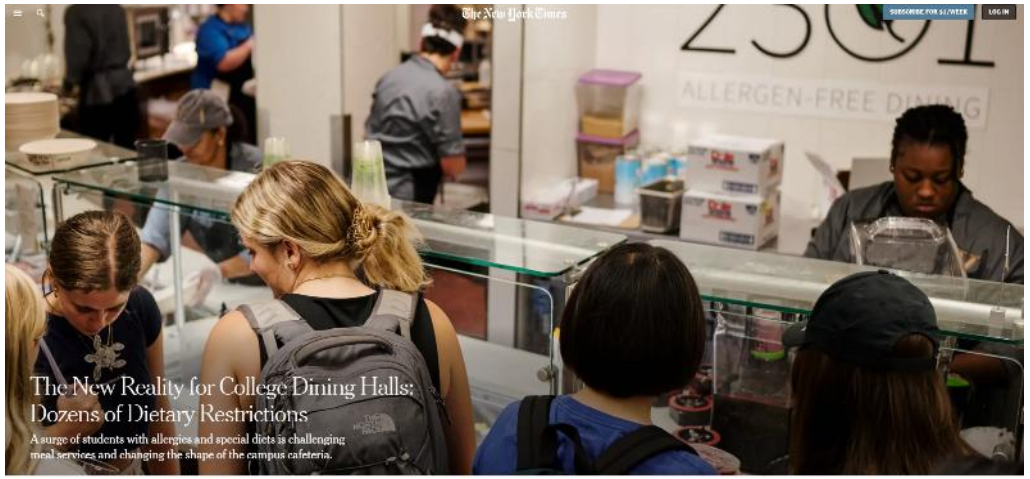
Improvement of allergen labeling at campus events



Mandatory allergen training for dining staff and students

# CAFAE in the News

The New York Times




https://www.nytimes.com/2023/09/05/dining/college-dining-halls-allergies-restrictions.html

The Washington Post

Practicing to administer epinephrine injections by using oranges can prepare students to help someone experiencing a severe allergic reaction. (Jamie Kelter Davis for The Washington Post)

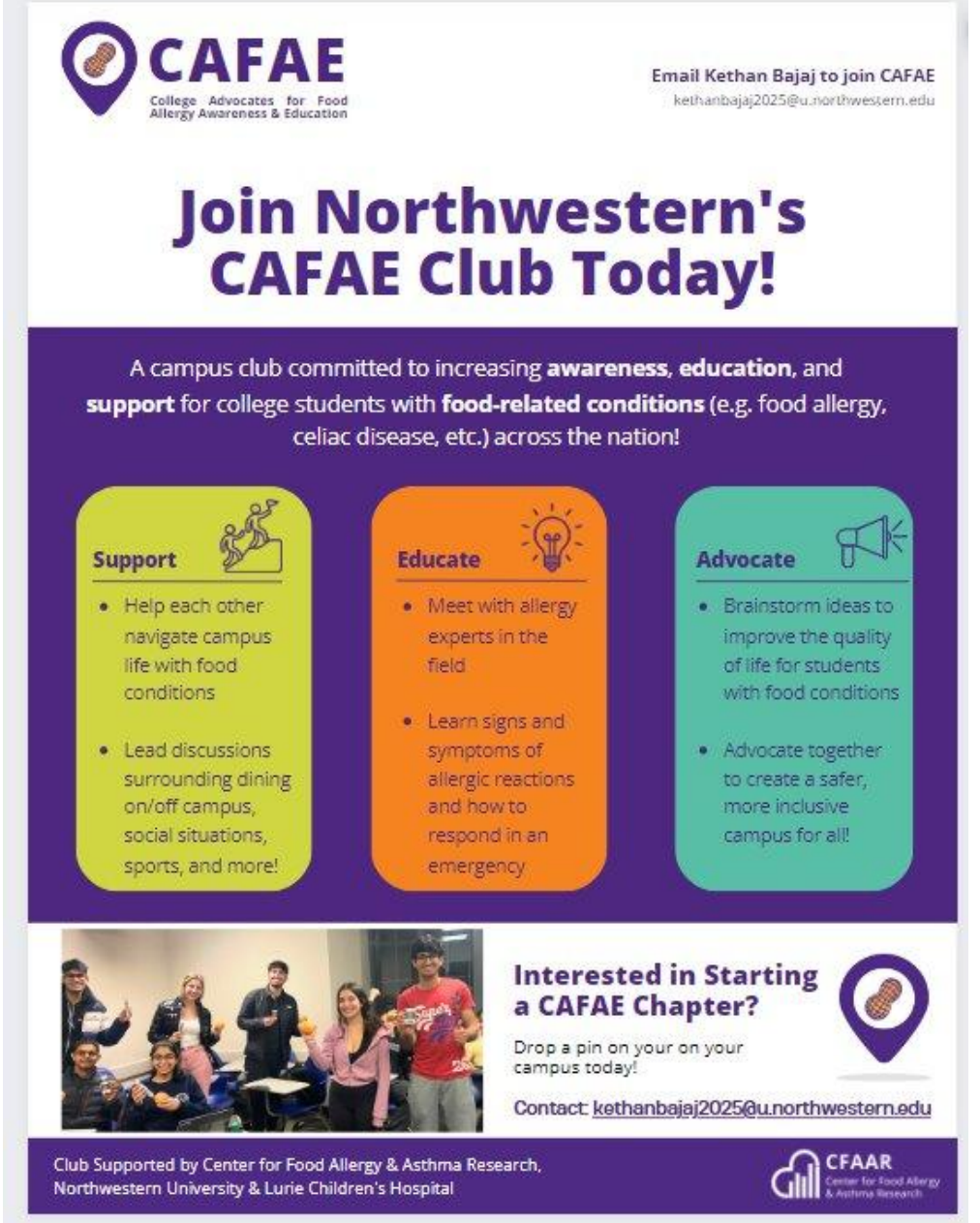
Bajaj and Auerbach share information about food allergies through the College Advocates for Food Allergy Awareness and Education club, which they co-founded. (Jamie Kelter Davis for The Washington Post)

https://www.washingtonpost.com/wellness/2023/08/31/food-allergies-college-risks/

# Learn More About CAFAE

- Visit https://www.cafae.org/
- Email cafae@u.northwestern.edu

CAFAE
College Advocates for Food Allergy Awareness & Education




FARE

CFAAR
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& Asthma
NETWORK

Red Sneakers for Oakley™
Food Allergy Awareness

FAACT
Food Allergy & Anaphylaxis
Connection Team

CURED
campaign urging research for eosinophilic disease
www.curedfoundation.org

American
College
of Allergy, Asthma
& Immunology

MOCHA
MOCHAllergies.org

INTERNATIONAL FPIES ASSOCIATION
I-FPIES

ALLISON
ROSE
FOUNDATION

Apfed
American Partnership
for Eosinophilic Disorders

EAACI
EUROPEAN ACADEMY OF ALLERGY
AND CLINICAL IMMUNOLOGY

American Academy of
Allergy Asthma & Immunology

Food Equality™
INITIATIVE

# Reported Positive Aspects of Living with FA

**Adolescents and young adults reported that food allergy made them:**

- More responsible
- A better advocate for themselves and others
- Supportive of others with special needs
- More appreciative of the foods they can eat
- Eat healthier options

CFAAR Center for Food Allergy & Asthma Research

Warren CM, Dyer AA, Otto AK, Smith BM, Kauke K, Dinakar C, Gupta RS. Food Allergy-Related Risk-Taking and Management Behaviors Among Adolescents and Young Adults. J Allergy Clin Immunol Pract. 2017 Mar-Apr;5(2):381-390.e13. doi: 10.1016/j.jaip.2016.12.012. Epub 2017 Jan 27. PMID: 28132799.

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# The Future of Food Allergy

Ann & Robert H. Lurie
Children's Hospital of Chicago®

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# Research Shaping the Next Decade

- **More precise diagnosis:** Biomarkers and component testing will better identify true allergy, severity risk, and the chance of outgrowing allergies
- **Expanded early introduction for prevention:** Large trials aim to guide early introduction of multiple allergens
- **Microbiome and skin‑barrier breakthroughs:** New insights into eczema, gut health, and early‑life environments may open new pathways for preventing sensitization
- **More treatment options for all ages:** OIT, EPIT, SLIT, and biologics (omalizumab, dupilumab) will broaden treatment options
- **Combination therapy and personalized care:** Pairing biologics with immunotherapy and using predictive tools may improve safety, effectiveness, and long‑term tolerance

# Expanding Options for Emergency Treatment


## Epinephrine Auto-Injector Brands:

EpiPen® / EpiPen Jr. ®
Auvi-Q ®
Adrenaclick ®
Symjepi ®

## Generic Epinephrine:

Amneal Pharmaceuticals (Adrenaclick)
Teva Pharmaceuticals (EpiPen/EpiPenJr.)
Viatris (EpiPen/EpiPenJr.)

## Epinephrine Nasal Spray:

neffy®

# Sublingual Epinephrine Coming Soon

- The FDA accepted the new drug application for dibutepinephrine (Anaphylm™) epinephrine sublingual film
- If approved, it would be the first and only **orally-delivered, device-free epinephrine option** to treat severe allergic reactions in the US
- Designed as a small, weather-resistant sublingual film (postage-stamp size). No water or swallowing is required for administration
- Pediatric study (ages 7–17) showed consistent pharmacokinetics (PK), well-tolerated, and no serious adverse events.
- **Decision expected in early 2026**



https://www.contemporarypediatrics.com/view/fda-accepts-nda-for-epinephrine-sublingual-film-to-treat-type-1-allergic-reactions

# Working Together to Improve Policy

## FDA Workshop

**Improving Anaphylaxis Outcomes: Approaches for Enhancing Access to Epinephrine**

December 16, 2025

## FDA Virtual Public Meeting and Listening Session

**Food Allergen Thresholds and Their Potential Applications**

February 18, 2026

## FDA Meeting

**Expert Panel on Food Allergies**

February 25, 2026

*Hosted by the Center for Food Allergy & Asthma Research (CFAAR)*

# 2026 Global Food Allergy Prevention Summit

**Oak Brook, IL | October 22-24, 2026**

## KEY TOPICS:

- Early Dietary Influences
- Microbiome & Environmental Factors
- Early Treatment & Secondary Prevention
- Molecular Mechanisms
- Skin: Barrier or Pathway

***Registration opens on March 1st!***

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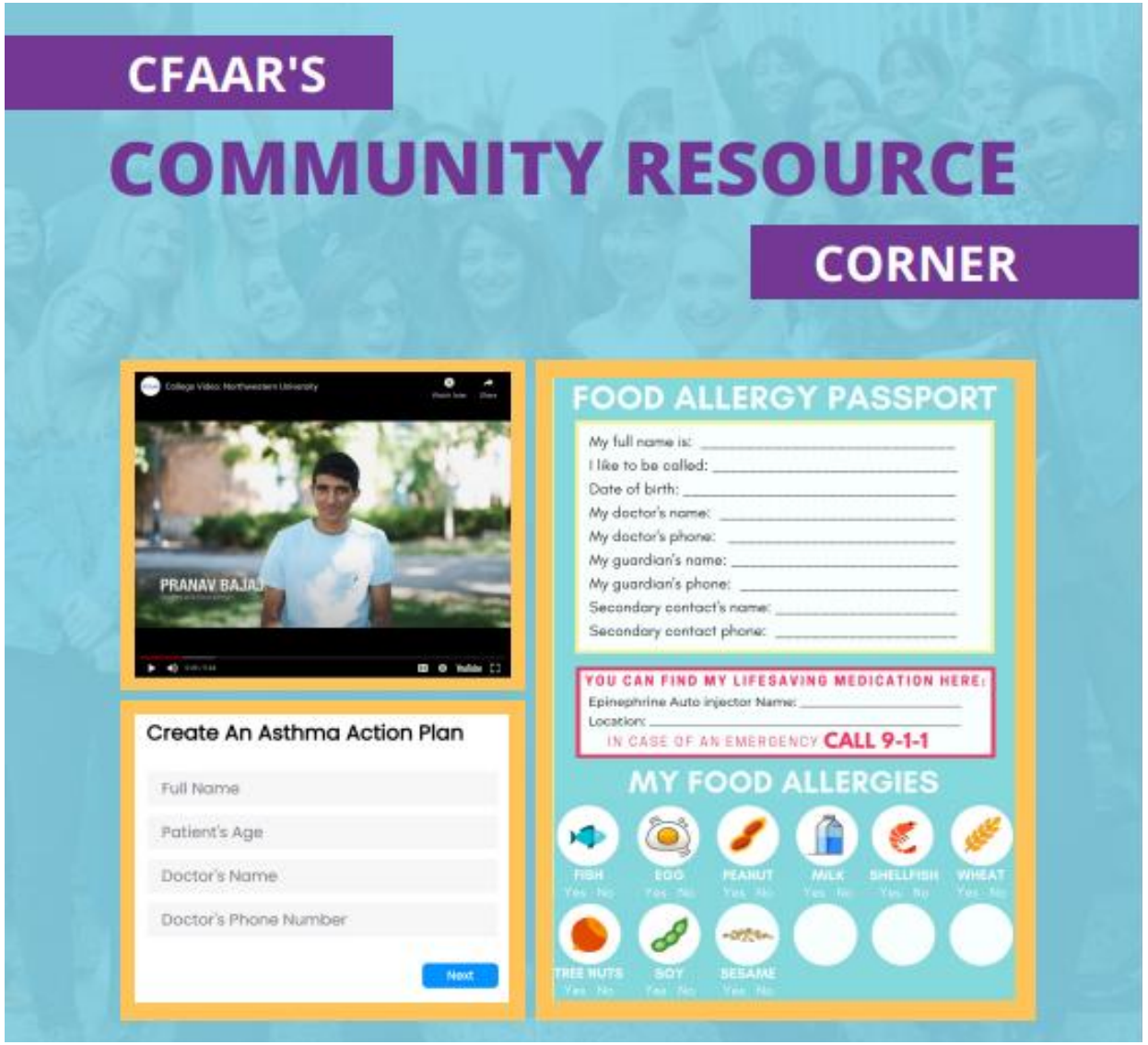
Center for Food Allergy & Asthma Research

**Do the best you can until you know better. Then when you know better, do better.**

*- Maya Angelou*




**Browse all CFAAR Resources here or by visiting cfaar.northwestern.edu**

# Thank you!

## Connect with CFAAR

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