




Nutrition First  
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## Food Allergy Updates

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## Disclosures

- No financial relationships to disclose
- Community physician
- Participate in regional and national allergy organizations
- Volunteer clinical faculty at UW
- Try to keep up with new developments!

## Background

- Food allergies have been on the rise in recent years, though it's unclear why.
- There has been a sharp upswing in food allergy awareness, anxiety, and testing.
- Food allergy guidelines have been in flux, sometimes with contradictory information.
- Currently there are no official means of preventing or treating food allergy.

## Today's objectives

- Review common food allergies and epidemiology
- Diagnosis, testing, and management
- Early food introduction
- Can we *prevent* or *treat* food allergies?
- When to refer to an allergist
- Case
- Time for questions

## Definitions

Adverse food reaction: any untoward reaction to ingesting food or a food additive

- **Food allergy/hypersensitivity**: adverse food reaction due to an *immunologic* mechanism
  - e.g. IgE "allergic" antibodies
  - symptoms can include: immediate hives, swelling, difficulty breathing, vomiting/diarrhea, loss of consciousness
  - reaction occurs with every exposure

## Definitions

Adverse food reaction: any untoward reaction to ingesting food or a food additive

- **Food intolerance**: adverse reaction due to a physiologic or non-immunologic mechanism
  - lactose intolerance
- **Food sensitivity**: highly subjective
  - variable symptoms: fatigue, headache, behavior change, "inflammation"
  - no validated testing to rule in or rule out
  - empiric food elimination may be the best approach

### Immunologic (Allergic) Adverse Food Reactions



- IgE-Mediated**
  - Systemic (Anaphylaxis)
  - Oral Allergy Syndrome
  - Immediate gastrointestinal allergy
  - Asthma/rhinitis
  - Urticaria
  - Morbilliform rashes and flushing
- Mixed IgE/Non IgE**
  - Eosinophilic esophagitis (EoE)
  - Eosinophilic gastritis
  - Eosinophilic gastroenteritis
  - Atopic dermatitis
- Non-IgE Mediated Cell-Mediated**
  - Food Protein-Induced Enterocolitis
  - Food Protein-Induced Enteropathy
  - Food Protein-Induced Proctocolitis
  - Dermatitis herpetiformis
  - Contact dermatitis

Sampson HA. J Allergy Clin Immunol 2004;113:805-9.  
Chapman J, et al. Ann Allergy Asthma Immunol 2006;96:S51-68.

### Non-Immunologic Adverse Food Reactions

#### Toxic / Pharmacologic

- Bacterial food poisoning
- Heavy metal poisoning
- Scombroid fish poisoning
- Caffeine
- Alcohol
- Histamine

#### Non-Toxic / Intolerance

- Lactase deficiency
- Galactosemia
- Pancreatic insufficiency
- Gallbladder / liver disease
- Hiatal hernia
- Gustatory rhinitis
- Anorexia nervosa
- Idiosyncratic
- Carbohydrate malabsorption

Sicherer SH, Sampson HA. J Allergy Clin Immunol 2006;117:S470-475.

### Estimated Prevalence of Food Allergy

Food	Children (%)	Adults (%)
<b>Cow's milk</b>	<b>2.5</b>	0.3
<b>Egg</b>	<b>1.5</b>	0.2
Wheat, Soy	0.4	0.3
<b>Peanut</b>	<b>2.0</b>	0.6
Sesame	0.1	0.1
Tree nut	0.5	0.6
<b>Crustacean</b>	0.1	<b>2.0</b>
<u>Fish</u>	<u>0.1</u>	<u>0.4</u>
<b>Overall</b>	<b>6.0%</b>	<b>2-3.5%</b>

Sicherer SH, Sampson HA. J Allergy Clin Immunol 2010;125:S116-125.

### Cross-reactivity

Cow/goat milk (92%)

Peanut

- tree nut, sesame

Among tree nuts (37%)

- cashew/pistachio together
- walnut/pecan together

- almond allergy less common

Among shellfish (75%)



Sicherer SH JACI 2001;108:881-90

### Natural History of Food Allergy

- ~ 80% of **milk, soy, egg,** and **wheat** allergy remit by teenage years
  - declining/low levels of specific-IgE may help predict resolution
  - >70% of children tolerate extensively heated egg, prior to tolerating partially-cooked versions
- Allergies to **peanut, tree nuts, seeds, seafood** are typically lifelong
  - more often associated with severe reactions
  - epinephrine autoinjector for all nut, seed, and seafood allergies
  - ~150 food allergy deaths/yr (especially peanut and tree nut anaphylaxis)

### Natural history of Food Allergy

Food	Typical Onset/Resolution of IgE mediated allergy
<b>Milk</b>	Develops: usually first 6-12 months of life Resolves: 37% by age 12 yrs, 79% by 16 yrs
<b>Egg</b>	Develops: first 6-24 months Resolves: 48% by age 12 yrs, 68% by 16 yrs
<b>Wheat</b>	Resolves: 65% by age 12 years
<b>Peanut</b>	Develops: most before age 2 yrs 75% of reactions at 1 <sup>st</sup> exposure Resolution: <b>20% overall</b> , ~9% relapse rate
<b>Tree Nuts</b>	Develop: ages 1-7 yrs, or as adults Resolution: in <b>~10% overall</b>
<b>Fish/Shellfish</b>	Develop: fish in late childhood or adulthood shellfish (shrimp) often adulthood (60%) Resolution: uncommon or rare

## Common food reactions: **Infants/Toddlers**

- **Food Protein-Induced Allergic Proctitis/Proctocolitis**
  - often cow's milk/soy protein
  - blood in stool ± other symptoms, usually well-appearing infant
  - usually negative skin/blood testing
  - dairy/soy avoidance until 1-2 years of age
- **Atopic Dermatitis** (aka eczema)
  - discuss later
- **Classic food allergy** (IgE-mediated)
  - egg, dairy, nuts, seeds, seafood, wheat, soy
  - rapid-onset hives, swelling +/- respiratory (cough, wheeze) or GI (vomiting, diarrhea) symptoms
  - allergy testing can be helpful

## Food Protein-Induced Enterocolitis Syndrome (FPIES)

- Repeated vomiting 2-4 hours after eating certain solids for the first time
  - **cow's milk, soy, rice, oat, poultry, sweet potato...**
  - often more than 1 food (e.g. milk + soy)
- Can be severe, but usually self-limited
  - may see watery/bloody diarrhea several hours later
  - severe cases: hypovolemia, leukocytosis, thrombocytosis, metabolic acidosis, methemoglobinemia
- Differential is broad:
  - infectious gastroenteritis, sepsis, NEC, anaphylaxis, inborn errors of metabolism, lactose intolerance, GER, Hirschsprung disease, eosinophilic esophagitis/enteritis, celiac, malrotation/volvulus

Nowak-Węgrzyn JACI, Jan 2017

## Food Protein-Induced Enterocolitis Syndrome (FPIES)

- Avoid trigger foods, watch for others
- Testing (sIgE) is usually negative
- Spontaneous resolution in 1-4 years
  - 80% outgrow by 4 years
  - rare in teens, adults?
- When to oral food challenge??
- Also consider **chronic FPIES**
  - intermittent vomiting/diarrhea, poor weight gain, FTT
  - resembles many other conditions (GE reflux?)
  - resolves upon elimination of trigger food(s)

Nowak-Węgrzyn JACI, Jan 2017

## Common food reactions: **all ages**

- **Classic food allergy** (IgE-mediated)
- **Oral Allergy Syndrome**
  - pollen/food cross-reactivity
    - e.g. birch pollen ↔ celery, carrot, pitted fruit
  - primarily oral symptoms (itch, tingle), resolve with cooking
  - can improve with allergy shots
- **Eosinophilic Esophagitis (EoE)**
  - infants: vomiting, FTT, food refusal, "reflux"
  - adults: food impaction, painful swallowing, "bad reflux"
  - food often a trigger (e.g. **dairy**)
  - food allergy testing has limited benefit

## Current Food Allergy Management

1. **Make an accurate diagnosis**
2. **Eliminate trigger foods**
3. **Be prepared for food allergy reactions**
4. **Consider oral food challenge**

## Food Allergy Evaluation and Diagnosis

- History, History, History!
  - food, timing, symptoms, reproducibility
- Skin or blood testing *if* indicated
  - detect food-specific IgE antibodies
  - skin and blood testing are roughly equivalent
  - high false-positive rate ("cries wolf")
    - "sensitized" vs. true clinical allergic reactions
  - experienced **interpretation** is critical to making an accurate diagnosis

## Food allergy tests

- Skin prick tests
  - looks for pre-formed allergic **IgE antibodies**
  - same day, takes 15-20 minutes to complete
  - reliability:
    - helpful for ruling **IN** a food allergy (specific)
    - excellent at ruling **OUT** a food allergy (sensitive)
  - may test at 4-6 months of age
- Blood tests
  - **IgE antibody** levels in the blood ("RAST", "ImmunoCAP")
  - requires a needle stick, days to weeks for results
  - similar reliability, not as sensitive as prick testing
  - may test at 4-6 months of age

## Skin prick testing



## Other food allergy tests

- Skin patch tests
  - takes 3-5 days
  - questionable utility in food allergy diagnosis/management
- Intradermal food skin tests
  - injection under skin, look for food-specific IgE antibodies
  - *NOT recommended for food allergy testing*
- Unproven/Experimental tests to avoid
  - food-specific IgG/IgG4 levels
  - provocation/neutralization
  - cytotoxic tests
  - applied kinesiology (muscle response testing)
  - hair analysis
  - electrodermal testing

## Food Avoidance

## Food allergy at school



## Dietary Elimination

- **Complete avoidance** (e.g. peanut) vs. **partial avoidance** (e.g. avoid whole egg but eat baked egg products if tolerant)
- **FALPCA**<sup>1</sup> (effective 1/1/06) requires labeling for the 8 major food allergens.
- **Advisory warning labels** (May contain..., Processed in a facility...). For peanut, <10% of products had peanut.<sup>2</sup>
- **Cross contact issues**: share equipment, fried foods
- **Dietary counseling**

<sup>1</sup>Food Allergen Labeling and Consumer Protection Act of 2004 (P.L. 108-282) (FALCPA)  
<sup>2</sup>Allen KI, et al WAQ Journal 2014;7:10

## Hypoallergenic Infant Formulas for Cow's Milk Allergy (CMA)

- **Soy based formulas** For IgE-CMA, soy co-allergy is 0-14%<sup>1</sup>. For non-IgE CMA, soy co-allergy 0%<sup>2</sup> to 60%<sup>3</sup>.
- Partial hydrolysates (e.g. Good Start, Peptamin Jr, Pediasure Peptide) are not recommended for CMA
- **Extensively hydrolyzed formulas (EHF)** Alimentum, Nutramigen: >90% tolerance in IgE-CMA
- **Elemental amino acid based formulas** (Neocate, Elecare): CMA, FPIES intolerant of EHF, EoE

<sup>1</sup>Katz Y, et al. JACI 2010;126:77-82.  
<sup>2</sup>Katz Y, et al. JACI 2011;127:647-53.  
<sup>3</sup>Sicherer SH, et al. J Pediatr 1998; 133: 214-219

## Anticipating food allergy reactions

- Food allergic reactions can sometimes develop into life-threatening reaction
  - variable triggers: quantity, route, state of health
  - *reaction severity cannot be predicted using test results or previous reaction history*
- Treatment
  - antihistamines for “minor” reactions
  - self-injectable epinephrine (adrenaline) for “severe” or “systemic” reactions (aka anaphylaxis)

## Managing Anaphylaxis

- Written Anaphylaxis Emergency Action Plan
- Emergency identification bracelet
- Epinephrine: drug of choice for systemic reactions
  - 2 doses of self-injectable epinephrine available on hand at all times (in case of biphasic reaction)
- Antihistamines: WILL NOT STOP ANAPHYLAXIS



Simons FE, JACI 2010;125(2 Suppl 2):S161-81. Kim JS, et al. JACI 2005; Jul;116(1):164-8.  
 Rudders S, et al. Pediatrics 2010;125:e711-8. Rudders S et al. Allergy Asthma Proc. 2010;31:308-16

## Common questions

- **Can we prevent food allergy?**
- **What should I feed my baby?**
- **Is food allergy causing my baby's eczema?**

## Can we prevent food allergy?

- No official means of preventing food allergy<sup>1</sup>
- Early food introduction may be protective
  - prior observation: 1/10 prevalence of PN allergy in Israel
- **LEAP study: early peanut exposure may reduce the risk of developing peanut allergy...**

<sup>1</sup>. Fleischer DM et al. J Allergy Clin Immunol: In Practice. 2013;1:29-36

## Learning Early About Peanut (LEAP 2015)



- Landmark RCT, 640 infants, 4-11 months of age at high risk for developing PN allergy
  - High risk = **severe eczema, egg allergy, or both**
  - skin tested, placed into 3 group, +/- peanut, and later assessed at 5 years of age
- **Group 1:**
  - skin test: >4 mm wheal = “peanut allergic”
  - excluded from study
- **Group 2:**
  - skin test: negative
  - ate peanut ~6 grams per week (3 rounded teaspoons peanut butter)
  - avoided peanut
- **Group 3:**
  - skin test: 1-4 mm wheal
  - ate peanut: ~6 grams per week
  - avoided peanut

DuToit G et al. N Engl J Med 2015;372:803-13

### LEAP: PN allergy prevalence at 5 years of age

- **Group 1:** ("allergic", did not enroll)
- **Group 2:** (negative skin test group)
  - ate peanut: 1.9% allergic
  - avoided peanut: 13.7% allergic ( $p < 0.001$ ; 86% RRR)
- **Group 3:** (skin test 1-4 mm wheal)
  - ate peanut: 10.6% allergic
  - avoided peanut: 35% allergic ( $p = 0.004$ ; 70% RRR)

\*DuToit G et al. N Engl J Med 2015;372:803-13

### 2017 addendum guidelines for prevention of peanut allergy in the US

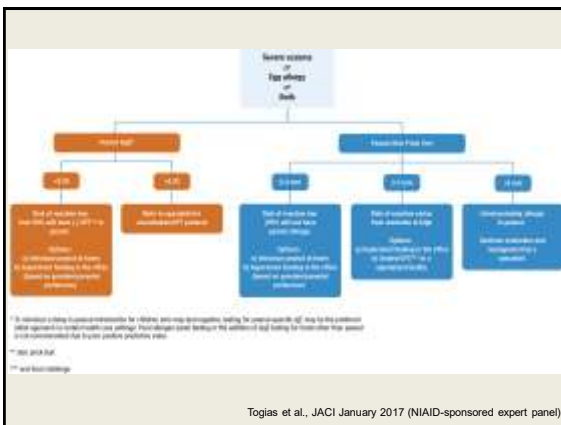
- **Guideline #1** (severe eczema and/or known egg allergy)
  - PCP may check peanut specific IgE
    - If undetectable ( $< 0.35$ ), then try peanut at home
    - If positive ( $\geq 0.35$ ), then refer to an allergist for further evaluation
- **Or refer to an allergist for skin prick testing**
  - If SPT 0-2 mm wheal, then try peanut in the office, or at home
  - If SPT 3-7 mm wheal, then supervised feeding in specialist office
  - If SPT  $\geq 8$  mm wheal, then probably allergic to peanut

Togias et al., JACI January 2017 (NIAID-sponsored expert panel)

### 2017 addendum guidelines for prevention of peanut allergy in the US

- **Guideline #2** (mild-moderate eczema)
  - no testing necessary, try peanut at home around 6 months, "in accordance with family preferences and cultural practices"
  - may consider referral to an allergist for testing and in-office peanut introduction
  - avoid choking hazards (unthinned peanut butter, peanut pieces)
- **Guideline #3** (no eczema or food allergy)
  - no testing necessary
  - introduce peanut "freely" into the diet together with other solids, and in accordance with family preferences and cultural practices

Togias et al., JACI January 2017 (NIAID-sponsored expert panel)



### Early Peanut Introduction



- **Initial peanut introduction:**
  - 2 g peanut protein = 2 tsp (9-10 g) *thinned* peanut butter (e.g. hot water, apple sauce, vegetable puree), or 1 bag of Bamba
- **If tolerated, then continue eating 2 g peanut protein 3 times per week until age 5**
  - 2 g = 1 bag (28 g) Bamba, peanut butter on bread or toast (16 g), 2.5 tsp ground peanuts (8 g)
  - avoid choking hazards (unthinned peanut butter, peanut pieces)

Togias et al., JACI January 2017 (NIAID-sponsored expert panel)

### 2 grams of peanut protein, 3x per week

Formula	Peanut butter	Almonds	Peanut flour or ground nutmeg powder
Amount containing approximately 2 g of peanut protein	1 1/2 g or 1/2 of a 28 g (1 oz) tub or 2 1/2 sticks	1/2 oz or 2 tablespoons (1/4 cup) whole peanuts (1/2 teaspoon of ground peanuts)	2 g or 2 teaspoons
Typical serving size	1 tsp (5g)	1/2 tsp (2.5g) or 1/2 oz (14g)	2/3 teaspoon of ground peanuts (2g)
Peanut protein per typical serving	1.2 g	3.4 g	2.2 g
Feeding tips	For a smooth texture, mix with water or breast milk or add to breast milk or infant formula and mash well.  Purined or crushed fruit or vegetables can be added.  Cook children's cereals offered alone or with formula.	For a smooth texture, mix with water or breast milk or infant formula.  For older children, mix with peanut or almond milk or vegetable or soy nut-based family foods, such as yogurt or mashed potatoes.	Use blender to create a paste or puree.  2-3 to 4 tablespoons of ground peanuts can be added to a portion of breast or peanut milk or serving size.

Togias et al., JACI January 2017 (NIAID-sponsored expert panel)

### What should I feed my baby?

### Evolving food introduction guidelines 2000 (AAP)

- All mothers: consider restricting peanut during pregnancy
- For **“high risk” infants** (= parent or sibling with allergies)
  - breast feeding moms eliminate peanut, tree nuts
  - also consider avoiding eggs, cow's milk, and fish
  - \*delay introduction of dairy until 12 months, eggs until 2 years, and peanut/tree nuts/fish until 3 years
- Based on expert consensus, and not intended for all infants

AAP Committee on Nutrition, Hypoallergenic Formulas (2000)

### Evolving food introduction guidelines 2008 (AAP), 2010 (NIAID)

- No convincing evidence to delay introduction of highly allergenic foods like dairy, egg, nuts, or seafood
- Did not specifically encourage introducing complementary foods (e.g. cow's, egg, soy, wheat, peanut, tree nuts, fish, shellfish) or when

Greer FR et al. Pediatrics 2008  
Fleischer DM et al. JACI: In Practice 2013;1:29-36  
Boyce JA, et al. J Allergy Clin Immunol 2010;126:51-58

### What should I feed my baby?

- Exclusive breastfeeding is recommended until 4-6 months of age
  - may reduce risk of milk allergy, eczema, wheezing
- For infants at high-risk who cannot be exclusively breastfed for first 4-6 months
  - hydrolyzed formula may prevent eczema
- Maternal avoidance diets during pregnancy and lactation are not recommended based on current data

Fleischer DM et al. J Allergy Clin Immunol: In Practice. 2013;1:29-36

### Is food allergy causing my baby's eczema?

## Atopic Dermatitis (aka Eczema)

- Atopic Dermatitis is common
  - non-allergic and allergic (food, environmental) triggers
  - **managing allergic triggers will not “cure” AD**
  - diligent skin care: frequent bathing, non-soap cleansers, emollients, as-needed topical steroids, +/- bleach baths, wet wraps
  - AD often resolves before school age
- Common allergic triggers in AD
  - foods: **egg**, milk, peanut, tree nuts, wheat, soy, seeds, **seafood**
  - (indoor) environmental triggers often overlooked: **dust mites, cat, dog**

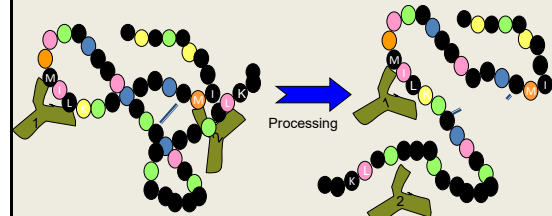
## Eczema and food sensitization/allergy

- General population (no eczema):
  - 28% of US children are *sensitized* to foods (i.e. positive skin or blood test, but no clinical reaction)
  - 8% have a positive peanut test (sensitized)
- Infants/children with eczema
  - elevated total IgE is common
  - **50-80% test positive** (sensitized) to at least one food<sup>1</sup>
    - e.g. milk, egg, and peanut; often wheat or soy
  - 84-93% of food were being avoided unnecessarily<sup>2</sup>
    - eczema referral center
    - “food allergy” diagnosed primarily by specific IgE (“RAST”) testing

1. Boyce JA, et al. *J Allergy Clin Immunol* 2010;126:S1-S8  
2. Fleischer DM et al. *J Pediatrics* 2011;158:578-583

## Food Allergy “Treatments”

## Effect of Cooking & Digestion on Food Proteins



Children who “outgrow” milk (or egg) allergy will often tolerate baked-milk products first

## BAKED GOODS

### Changing from Avoidance to Limited Diet

- 70% of children with egg allergy tolerate in baked goods
- 75% of children with milk allergy tolerate in baked goods
- Regular ingestion of these proteins is associated with less positive test results
- Regular ingestion may result in more rapid resolution of milk/egg allergy

## Food Desensitization

- **Desensitization:** change in the threshold dose of food needed to cause an allergic reaction while therapy is continued
- **Sustained Unresponsiveness:** allergy has resolved
- **Oral immunotherapy (OIT)**
  - consume (eat) increasing amounts of allergenic food daily
  - drops or tiny pieces of food
- **Epicutaneous immunotherapy (EIT)**
  - patch/sticker with small amount of allergenic food
  - daily application



## OIT/EIT Progress

- **Oral immunotherapy**
  - most patients on OIT achieve desensitization, but very few achieve “sustained unresponsiveness”
  - may see more success in infants and young children
  - chronic GI side effects lead to poor adherence
  - occasional/unpredictable systemic reactions
- **Epicutaneous immunotherapy**
  - well tolerated, relatively safe
  - skin rash, itching are common
  - currently in FDA phase III study, approval in 1-2 years?

Gernez et al. JACI In Practice 2017

## Other news

## Influenza

- Fever, cough, body aches
- 294,128 influenza hospitalizations per year in US<sup>1-2</sup>
  - 21,156 are children under 5 years old
- 23,607 deaths per year
  - 124 children
- Vaccines
  - IIV (inactivated influenza vaccine, trivalent or tetravalent)
  - LAIV (live attenuated intranasal influenza vaccine)
    - **FluMist® nasal spray NOT approved for 2017/2018 season<sup>3</sup>.**

1. Grohskopf et al. Prevention and Control of Seasonal Influenza with Vaccines. MMWR Recomm Rep 2016;65:1-54.  
2. Thompson et al. Influenza-Associated Hospitalizations in the United States. JAMA 2004;292:1333-40.  
3. <https://www.cdc.gov/flu/protect/keyfacts.htm>, accessed 10/18/17

## Influenza vaccination and egg allergy

- Most influenza vaccines grown in fertilized chicken eggs
  - trace amounts of egg protein (ovalbumin)
- Egg-containing influenza vaccines were contraindicated in patients with egg allergy
  - used to defer vaccination, split dosing, or arcane skin testing

Growing evidence egg allergy may not be a problem..

## Influenza vaccination and egg allergy

- CDC guidance for 2017-2018 season<sup>1</sup> (unchanged from last year)
  - if mild egg allergy (e.g. hives only), then may receive any licensed, age-appropriate flu vaccine
  - if history of **severe reaction to egg**, patients should receive influenza vaccine in a **supervised medical setting**
- 2018 and beyond
  - **give influenza vaccine to all egg-allergic patients** (no matter their reaction history)
  - inactivated or live attenuated vaccines
  - no need for testing, split dosing, or supervised administration
  - “Vaccine providers should not ask about the egg allergy status of recipients of influenza vaccine.”

1. <https://www.cdc.gov/flu/about/season/flu-season-2017-2018.htm>, accessed 10/18/17  
2. Greenhawt M, et al. Administration of Influenza Vaccines to Egg-Allergic Recipients: A Practice Parameter Update – 2017, draft.



## New FDA peanut labeling



“For most infants with severe eczema and/or egg allergy who are already eating solid foods, introducing foods containing ground peanuts between 4 and 10 months of age and continuing consumption may reduce the risk of developing peanut allergy by 5 years of age. FDA has determined, however, that the evidence supporting this claim is limited to one study.

**If your infant has severe eczema and/or egg allergy, check with your infant’s healthcare provider before feeding foods containing ground peanuts.”**

- A “Qualified Health Claim”, supported by *credible* scientific evidence
- vs. “Authorized Health Claim”, supported by *significant* scientific agreement

<https://www.fda.gov/Food/NewsEvents/ConstituentUpdates/ucm575001.htm>, accessed 10/18/17

## When to refer to Allergy

- Known or suspected food allergy reaction
- Infants with moderate/severe eczema refractory to management
- "Allergic" families (with infants, or expecting)
  - counseling about maternal and infant diets
  - testing, if indicated
- Child with older food-allergic sibling
  - 7% increased risk of peanut allergy
  - vs. avoiding testing?

Young MC, et al. JACI 2009;124:175-82.

## The Allergist's Role

- Use focused, evidence-based testing to confirm a known or suspected food allergy
- Assist in food allergy test interpretation
- Patient education:
  - identification of causative food, elimination diet
  - education on the signs and symptoms of allergic reactions and anaphylaxis, and appropriate treatment including correct epinephrine autoinjector technique
- Assist in formulation of individual health plans, particularly for child-care and educational settings
- Evaluate for and conduct food challenges
  - may rule-out food allergy

Fleischer DM, et al. J Allergy Clin Immunol: In Practice 2013;1:29-36.  
Boyce JA, et al. J Allergy Clin Immunol 2010;126:S1-S58.

### Case: eczema & food allergy in 1975



- 7 month old boy with mild eczema on cheeks, inner elbows
  - responds to moisturizer and occasional topical steroid
- Breastfed for first 6 weeks, then cow's milk formula
- Around 6 months, tried scrambled egg on 2 occasions:
  - hives and worse eczema both times
- How to proceed?
  - Need allergy testing?
  - Avoid other foods?
  - Will egg allergy go away?

### Case: eczema & food allergy in 1975



- Pediatrician: "Avoid egg, take care of eczema".
  - no routine allergy testing
  - no other food elimination
- Egg tolerated starting at 18-24 months
  - no other food sensitization (e.g. peanut)
- Eczema resolved at age 2-3 years
- Dr. Mom
  - "What's the big deal these days?"

### Case: Eczema in 2000-2007

- 7 month old with mild eczema on cheeks, inner elbows
  - breastfed for first 6 months
  - has tried fruit, veg, grains, but no "high-risk" foods
- Parents: "tell us which foods are causing eczema"
  - testing revealed multiple positives: egg, milk, wheat, soy, peanut, tree nuts
  - anxiety, numerous food eliminations
  - resolution of egg, milk, wheat, soy allergy by school age
  - **lifelong nut allergy**

### Case: Eczema in the future

- 7 month old with mild eczema on cheeks, inner elbows
  - breast feed for first year, watch for food triggers in breast milk
  - extensively hydrolyzed formula if CM allergy or CMPI
  - if CMPI, may consider soy formula if tolerated
  - elemental formula if completely dairy intolerant
- around 6 months
  - offer **baked egg/milk proteins** (bread, muffins, cakes) before uncooked/partially-cooked (pancakes, waffles; fried, scrambled, or boiled egg)
  - if no eczema or mild/moderate eczema, try peanut at home
  - see an allergist if moderate/severe eczema, known egg allergy, or both
  - otherwise, may introduce other foods

## Summary: food allergy



- Food allergies have been on the rise
- More allergy testing, diagnosis, and anxiety
- Evolving food introduction recommendations from experts
- No official means to prevent or treat food allergies
- **History** is key in making an accurate food allergy diagnosis
- Food allergy testing can be unreliable (especially if there's eczema) and result in incorrect diagnosis

## Summary: food allergy

- No evidence for maternal food avoidance during pregnancy/lactation
- At 6 months, encourage introduction to a wide range of foods -- may help *prevent* food allergies
- Most infants should try peanut protein for the first time at home
- If severe eczema, egg allergy, or other suspected food allergy, then refer to an allergist for evaluation
- If eczema, consider restricting egg first, then dairy (mom + infant's diets) before referral or testing
- Later consider maternal restriction of nuts, seafood, wheat, soy
- Younger sibling of food-allergic child: consider prophylactic testing

## Summary: food allergy

- If there is milk or egg allergy, exposure to baked milk/egg proteins (when tolerated) probably speeds up resolution of milk/egg allergy
- Future treatments (OIT, EIT) may have limited benefits and probably will not cure food allergy
- If egg allergy, may receive flu vaccine without special testing or precautions.
- May refer for supervised administration if family wants reassurance

## Food Allergy: Future Goals

- Manage children and adults with a known food allergy
- More responsible food allergy testing
- With early food introduction, hope to see a drop in food allergy prevalence
- Create a less fearful, and healthier relationship with food



Thank you for listening

Questions???

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## Food allergy prevalence

- 20-25% of American claims to have a food allergy (actual ~2-3%)
- Increasing prevalence
  - Increased peanut
- Studies question the increased prevalence

studies from p223 of In Practice  
n=7896, 6-13 yo 1998-1994 (11.2% sensitized, sIgE >0.35 to milk, egg, peanut, and shrimp) vs 2005-2006 (8.1% sensitized) National Health and Nutrition Examination Surveys. No change in prevalence of sensitization. Improved diagnosis/recognition? Delayed introduction converts from sensitized to clinical reactions?

Another study: "treating" AD with food elimination may lead to more clinical food allergies. 30% included anaphylaxis.  
Younger siblings of food-allergic children. 66.6% were sensitized, but only 13.6% were clinically reactive/allergic. Discourage screening of younger siblings (due to high false-positive rate?) Compared to other children, maybe these kids only have a modestly increased rate of allergy.