



Food Allergy

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Disclosures

- I have no relevant disclosures

Objectives

- Discuss the prevalence of food allergy
- Delineate the clinical manifestations of IgE mediated
- Outline the evaluation and management of food allergy

Outline

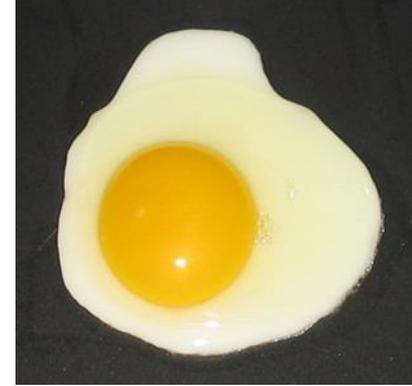
- Prevalence & Natural History
- Immunologic & Non-immunologic Food Reactions
- Risk Factors
- Clinical Manifestations
- Evaluation
- Management

Prevalence and Natural History

Definitions

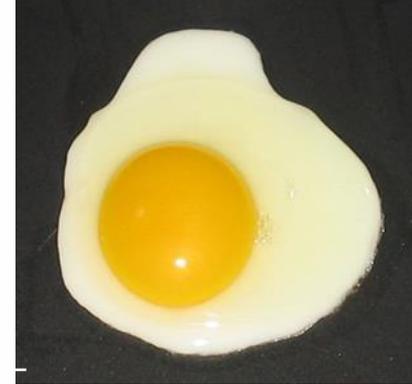
- **Food allergy**: an adverse health effect arising from a specific immune response that occurs reproducibly on exposure to a given food.
- **A food**: any substance—whether processed, semi-processed or raw—intended for human consumption including drinks, gum, additives and supplements.

Prevalence of Food Allergy



- Perception by public: 20-25%
- Confirmed allergy:
 - Adults: 2-3.5%
 - Infants/young children: 6%
- Specific Allergens
 - Geographical and cultural variations
- Prevalence higher in those with:
 - Atopic dermatitis
 - Pollen allergies
 - Latex allergy
- Prevalence increasing – 18% increase between 1997-2007

Prevalence of Food Allergy



<u>Food</u>	<u>Children (%)</u>
Cow's milk	1.9-3
Egg	0.5-2.5
Wheat, Soy	0.3-1
Peanut	1.2-5*
Tree nut	1.1
Crustacean	0.1
Fish	0.1
Overall	5

Natural History



- ~ 80% of cow milk, soy, egg and wheat allergy remit by teenage years
- Allergies to peanuts, tree nuts, seeds, fish and shellfish typically lifelong
- Resolution: ~20% peanut allergy, 9% tree nut allergies¹

Natural History (cont'd)

Factors helping to predict food allergy resolution
Factors indicating someone is less likely to outgrow a food allergy
-More severe symptoms with a past ingestion of the allergen [2 , 19 , 20]
-A lower eliciting dose to bring on a previous allergic reaction [21]
-The presence of other comorbid allergic diseases [2 , 3]
-Larger skin prick test wheal size [2 , 3 , 22]
-Higher food-specific IgE levels [2 , 3 , 5 , 14 , 19 , 23]
Factors indicating someone is more likely to outgrow a food allergy
-Tolerance of extensively heated milk (for developing tolerance to uncooked milk) [13]
-Tolerance of extensively heated egg (for developing tolerance to lightly cooked forms of egg) [14]

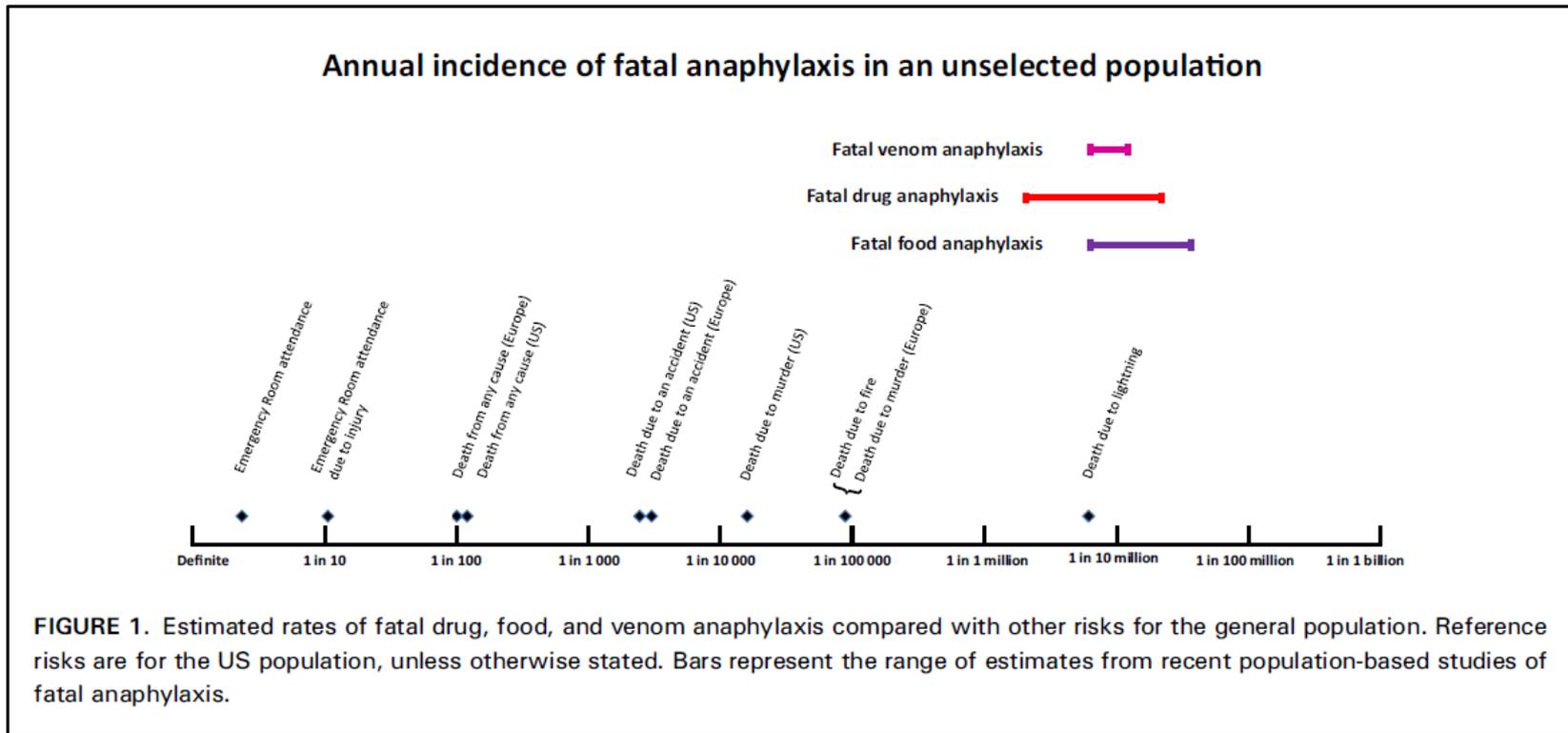
¹Fleischer DM. Curr Allergy Asthma Reports 2007;7:175-181.

²Boyce, JA et al. J Allergy Clin Immunol. 2010 Dec;126(6 Suppl):S1-58

Fatal Food Anaphylaxis

- Risk factors:

- Underlying asthma
- Delayed epinephrine
- Symptom denial
- Previous severe reaction
- Adolescents, young adults



¹Decker et al, JACI 2008; 116:1-65.

²Lieberman P, Ann Allergy Asthma Immunol 2005;95:211-2.

Adverse Food Reactions

Non-immunologic

Toxic / Pharmacologic

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

Non-Toxic / Intolerance

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

Adverse Food Reactions

Immunologic

IgE-Mediated



Non-IgE Mediated
Cell-Mediated

- Systemic (Anaphylaxis)
- Oral Allergy Syndrome
- Immediate gastrointestinal allergy
- Asthma/rhinitis
- Urticaria
- Morbilliform rashes and flushing
- Contact urticaria

Anaphylaxis

- Food allergy: #1 cause of anaphylaxis in the ED
- Average Annual Incidence increased from
 - 21/100,00 person-years in 1983-1987 to
 - 49.8 /100,00 person-years in 1990-2010¹
- Rapid-onset, 5-20% biphasic²
- May be localized (single organ) or generalized
- Potentially fatal
- Any food can induce anaphylaxis, but the majority of the most severe reactions triggered by peanut and tree nuts

¹Decker et al, JACI 2008; 116:1-65.

²Lieberman P, Ann Allergy Asthma Immunol 2005;95:211-2.



Pollen-Food Syndrome (Oral Allergy Syndrome)



- Key foods: raw fruits and vegetables
- Clinical features:
 - rapid onset oral pruritus and mild angioedema
 - rarely progressive (1% have systemic reactions)
- Pathophysiology: pollen allergens are the primary sensitizers and homologous proteins in plant-derived foods elicit symptoms
- 30-70% of people with allergic rhinitis have oral allergy syndrome

¹Decker et al, JACI 2008; 116:1-65.

²Lieberman P, Ann Allergy Asthma Immunol 2005;95:211-2.

Evaluation

7 year old with asthma ordered a shrimp dinner off the adult menu. Within 30 minutes he developed profuse vomiting, nasal congestion, and itchy skin. You tell the patient he had a reaction to shrimp and prescribe self-injectable epinephrine. Three weeks later, he has a similar reaction after eating pasta with pesto.



You would

- A. Refer to an allergist for testing.
- B. Get a list of the items in the meals
- C. Reinstruct on the use of epinephrine
- D. All of the above

(turns out it was pine nut allergy, not shrimp)

Evaluation: History & Physical Exam

- History: most important
 - Symptoms, timing, reproducibility, treatment and outcome
 - Concurrent exercise, medications
- Diet details / symptom diary
 - Subject to recall
 - “Hidden” ingredient(s) may be overlooked
- Physical exam: assess for other allergic and alternative disorders
- Identify general mechanism
 - Allergy vs intolerance
 - IgE vs non-IgE mediated

Evaluation: History & Physical Exam

I. SKIN

A. Erythematous Rash- % area involved _____

B. Pruritus

0 = Absent

1 = Mild, occasional scratching

2 = Moderate -scratching continuously for > 2 minutes at a time

3 = Severe – hard continuous scratching – excoriations

C. Urticaria/Angioedema

0 = Absent

1 = Mild – < 3 hives, or mild lip edema

2 = Moderate - < 10 hives but >3, or significant lip or face edema

3 = Severe – generalized involvement

D. Rash

0 = Absent

1 = Mild – few areas of faint erythema

2 = Moderate – areas of erythema

3 = Severe – generalized marked erythema (>50%)

II. UPPER RESPIRATORY

A. Sneezing/Itching

0 = Absent

1 = Mild – rare bursts, occasional sniffing

2 = Moderate – bursts < 10, intermittent rubbing of nose, and/or eyes or frequent sniffing

3 = Severe – continuous rubbing of nose and/or eyes, periocular swelling and/or long bursts of sneezing, persistent rhinorrhea

III. LOWER RESPIRATORY

A. Wheezing

0 = Absent

1 = Mild – expiratory wheezing to auscultation

2 = Moderate – inspiratory and expiratory wheezing

3 = Severe – use of accessory muscles, audible wheezing

B. Laryngeal

0 = Absent

1 = Mild – >3 discrete episodes of throat clearing or cough, or persistent throat tightness/pain

2 = Moderate – hoarseness, frequent dry cough

3 = Severe – stridor

IV. GASTROINTESTINAL

A. Subjective Complaints

0 = Absent

1 = Mild – complaints of nausea or abdominal pain, itchy mouth/throat

2 = Moderate – frequent c/o nausea or pain with normal activity

3 = Severe - notably distressed due to GI symptoms with decreased activity

B. Objective Complaints

0 = Absent

1 = Mild – 1 episode of emesis or diarrhea

2 = Moderate – 2-3 episodes of emesis or diarrhea or 1 of each

3 = Severe – >3 episodes of emesis or diarrhea or 2 of each

V. CARDIOVASCULAR/NEUROLOGIC

0 = normal heart rate or BP for age/baseline

1 = mild-subjective response (weak, dizzy), or tachycardia

2 = moderate-drop in blood pressure and/or >20% from baseline, or significant change in mental status.

3 = severe-cardiovascular collapse, signs of impaired circulation (unconscious)

Evaluation of Food Allergy

- Suspect IgE-mediated:
 - Panels/broad screening **should NOT** be done without supporting history because of high rate of false positives.
 - Skin prick tests (prick with fresh food if pollen-food syndrome)
 - *In vitro* tests for food-specific IgE
 - Oral food challenge
- Suspect non-IgE-mediated, consider:
 - Biopsy of gut, skin

Evaluation: Interpretation of Laboratory Tests

- Positive skin prick test or specific IgE
 - Indicates presence of IgE antibody NOT clinical reactivity
 - ~90% sensitivity
 - ~50% specificity
 - ~50% asymptomatic sensitization
 - Larger skin tests/higher sIgE correlates with increased likelihood of reaction but not severity
- Negative skin prick test or specific IgE
 - Essentially excludes IgE antibody (>95% sensitive)

Evaluation: Interpretation of Laboratory Tests

Food	95% PPV for s-IgE (kU/L)	95%PPV for SPT wheal diameter (mm)
Peanut	14	8
Tree nuts	15*	8
Milk (age <2 yr)	>5	
Milk	15	8
Egg (age <2 yr)	>2	
Egg	7	7
Fish	20	7

Diagnostic Approach: Suspicion of IgE-Mediated Allergy

- If test for food-specific IgE is
 - Negative: reintroduce food*
 - Positive: food avoidance recommended
- If elimination diet is associated with
 - No resolution: reintroduce food*
 - Resolution
 - Open / single-blind challenges to “screen”
 - DBPCFC for equivocal open challenges

** Unless convincing history warrants supervised challenge*

Management

Management of Food Allergy



- Complete avoidance of specific food trigger
- Ensure nutritional needs are being met
- Education
- Anaphylaxis Emergency Action Plan if applicable
 - most accidental exposures occur away from home

Management: Dietary Elimination

- Hidden ingredients in restaurants/homes (peanut in sauces, egg rolls)
- Labeling issues (“spices”, changes, errors)
- Cross contamination (shared equipment)
- Seeking assistance
 - Food allergy specialist
 - Registered dietitian: (www.eatright.org)
 - Food Allergy & Anaphylaxis Network (www.foodallergy.org; 800-929-4040) and local support groups

Label reading used to be very challenging!

Example: Cow's Milk

Contain cow's milk: Artificial butter flavor, butter, butter fat, buttermilk, casein, caseinates (sodium, calcium, etc.), cheese, cream, cottage cheese, curds, custard, Half&Half[®], hydrolysates (casein, milk, whey), lactalbumin, lactose, milk (derivatives, protein, solids, malted, condensed, evaporated, dry, whole, low-fat, non-fat, skim), nougat, pudding, rennet casein, sour cream, sour cream solids, sour milk solids, whey (delactosed, demineralized, protein concentrate), yogurt. **MAY contain milk:** brown sugar flavoring, natural flavoring, chocolate, caramel flavoring, high protein flour, margarine, Simplese[®].

As of January 1, 2006, all food containing “Big 8 Allergens” (cow's milk, peanut, tree nut, hen's egg, soy, wheat, fish, crustacean) in the U.S. **MUST** declare the ingredient on the label in COMMON language. Does **NOT** apply to non-Big 8 allergens (e.g., sesame).

Management: Emergency Treatment of Anaphylaxis

- Epinephrine: drug of choice
 - Have 2 doses of self-injectable epinephrine readily available at all times
 - If administered, seek medical care **IMMEDIATELY**
 - Train patients, parents, contacts: indications/technique
- Antihistamines: secondary therapy only:

WILL NOT STOP ANAPHYLAXIS (will not save lives)

Management: Emergency Treatment of Anaphylaxis

EPIPEN[®]
(epinephrine) Auto-Injector 0.3 mg
EpiPen[®] = one dose of 0.30 mg epinephrine (USP, 1:1000, 0.3 mL)

EPIPEN JR[®]
(epinephrine) Auto-Injector 0.15 mg
EpiPen Jr[®] = one dose of 0.15 mg epinephrine (USP, 1:2000, 0.3 mL)



Food Allergy Action Plan

Name: _____ D.O.B.: ____/____/____

Allergy to: _____

Weight: _____ lbs. Asthma: Yes (higher risk for a severe reaction) No

Place
Student's
Picture
Here

Extremely reactive to the following foods: _____

THEREFORE:

- If checked, give epinephrine immediately for ANY symptoms if the allergen was *likely* eaten.
- If checked, give epinephrine immediately if the allergen was *definitely* eaten, even if no symptoms are noted.

Any SEVERE SYMPTOMS after suspected or known ingestion:

One or more of the following:

- LUNG: Short of breath, wheeze, repetitive cough
- HEART: Pale, blue, faint, weak pulse, dizzy, confused
- THROAT: Tight, hoarse, trouble breathing/swallowing
- MOUTH: Obstructive swelling (tongue and/or lips)
- SKIN: Many hives over body

Or combination of symptoms from different body areas:

- SKIN: Hives, itchy rashes, swelling (e.g., eyes, lips)
- GUT: Vomiting, crampy pain



1. INJECT EPINEPHRINE IMMEDIATELY

2. Call 911
3. Begin monitoring (see box below)
4. Give additional medications:*
-Antihistamine
-Inhaler (bronchodilator) if asthma

*Antihistamines & inhalers/bronchodilators are not to be depended upon to treat a severe reaction (anaphylaxis). USE EPINEPHRINE.

MILD SYMPTOMS ONLY:

- MOUTH: Itchy mouth
- SKIN: A few hives around mouth/face, mild itch
- GUT: Mild nausea/discomfort



1. GIVE ANTIHISTAMINE

2. Stay with student; alert healthcare professionals and parent
3. If symptoms progress (see above), USE EPINEPHRINE
4. Begin monitoring (see box below)

Medications/Doses

Epinephrine (brand and dose): _____

Antihistamine (brand and dose): _____

Other (e.g., inhaler-bronchodilator if asthmatic): _____

Monitoring

Stay with student; alert healthcare professionals and parent. Tell rescue squad epinephrine was given; request an ambulance with epinephrine. Note time when epinephrine was administered. A second dose of epinephrine can be given 5 minutes or more after the first if symptoms persist or recur. For a severe reaction, consider keeping student lying on back with legs raised. Treat student even if parents cannot be reached. See back/attached for auto-injection technique.

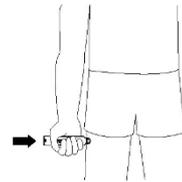
Parent/Guardian Signature _____ Date _____ Physician/Healthcare Provider Signature _____ Date _____

TURN FORM OVER

Form provided courtesy of FAAN (www.foodallergy.org) 7/2010

EPIPEN Auto-Injector and EPIPEN Jr Auto-Injector Directions

- First, remove the EPIPEN Auto-Injector from the plastic carrying case
- Pull off the blue safety release cap
- Hold orange tip near outer thigh (always apply to thigh)



- Swing and firmly push orange tip against outer thigh. Hold on thigh for approximately 10 seconds. Remove the EPIPEN Auto-Injector and massage the area for 10 more seconds



DE™ and the Dog logo, EPIPEN®, EPIPEN 2-Pak®, and EPIPEN Jr 2-Pak® are registered trademarks of Day Pharma, LP.

Adrenaclick™ 0.3 mg and Adrenaclick™ 0.15 mg Directions



Remove GREY caps labeled "1" and "2."



Place RED rounded tip against outer thigh, press down hard until needle penetrates. Hold for 10 seconds, then remove.

Twinject® 0.3 mg and Twinject® 0.15 mg Directions



Remove caps labeled "1" and "2."

Place rounded tip against outer thigh, press down hard until needle penetrates. Hold for 10 seconds, then remove.



SECOND DOSE ADMINISTRATION: If symptoms don't improve after 10 minutes, administer second dose:

Unscrew rounded tip. Pull syringe from barrel by holding blue collar at needle base.



Slide yellow collar off plunger.

Put needle into thigh through skin, push plunger down all the way, and remove.



A food allergy response kit should contain at least two doses of epinephrine, other medications as noted by the student's physician, and a copy of this Food Allergy Action Plan.

A kit must accompany the student if he/she is off school grounds (i.e., field trip).

Contacts

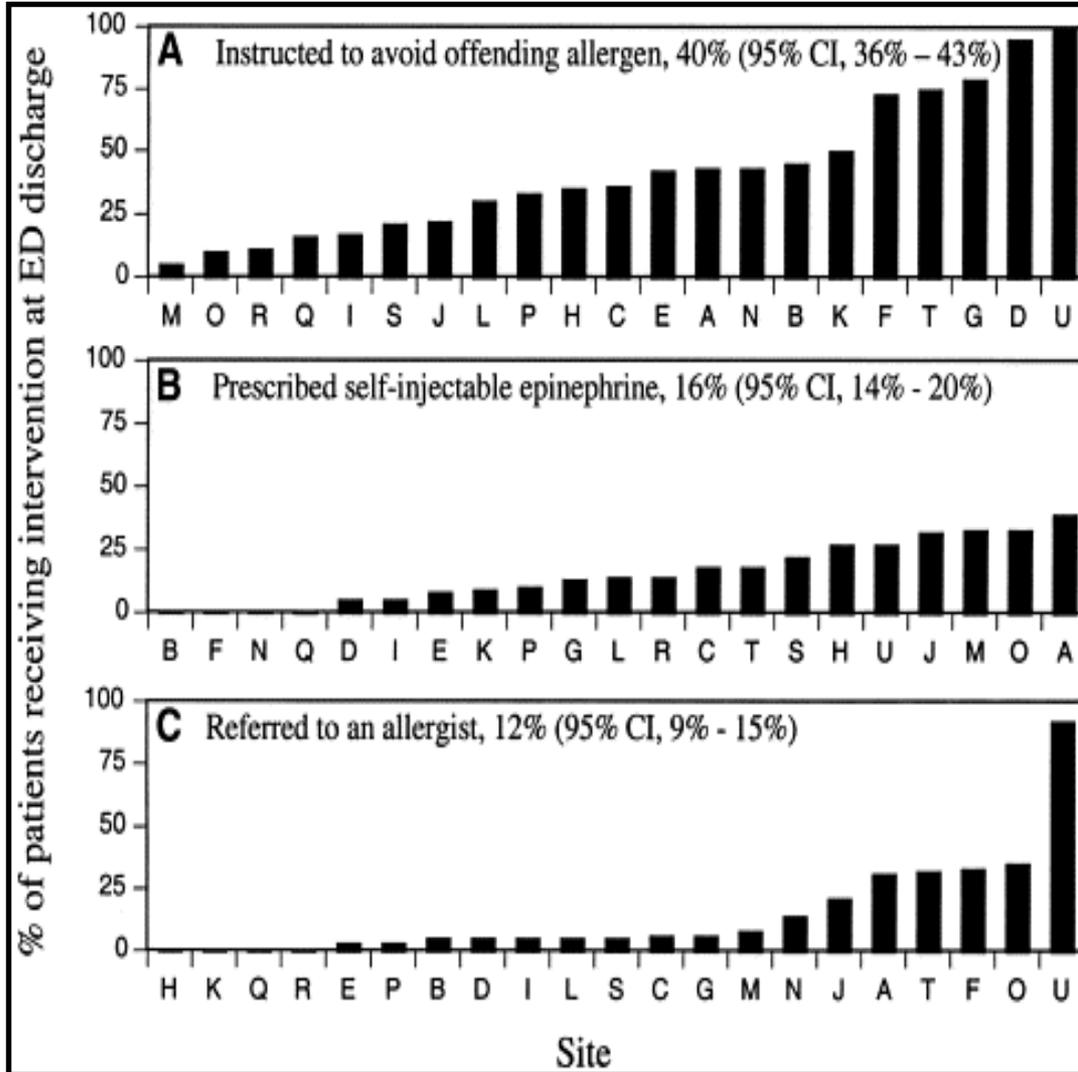
Call 911 (Rescue squad: () -) Doctor: _____ Phone: () - _____
Parent/Guardian: _____ Phone: () - _____

Other Emergency Contacts

Name/Relationship: _____ Phone: () - _____
Name/Relationship: _____ Phone: () - _____

Form provided courtesy of FAAN (www.foodallergy.org) 7/2010

Emergency Department Management of Food Allergy



Patients with severe food allergy may not receive education on avoidance, self-injectable epinephrine or referral to an allergist at emergency department visits. It is imperative for primary care doctors and allergists to recognize the risks and help patients avoid a future accident.

Role of the Allergist

- Identification of causative food, risk of anaphylaxis and education on elimination diet.
- Education on the signs and symptoms of allergic reactions and anaphylaxis, and appropriate treatment including correct technique of using epinephrine autoinjector.
- Assist in formulation of EAP, particularly for child-care and educational settings.

Role of the Allergist

- Regular follow-up to update status of food allergies and possible development of tolerance, and to update prescriptions for epinephrine and review technique of autoinjector use.
- Be a resource for not only patients and families, but for schools, the community and primary physicians.

Prevention

Food Allergy Prevention for At-Risk Infants: American Academy of Pediatrics 2008

- No evidence that maternal dietary restrictions during pregnancy or lactation prevents atopic disease.
- For high risk infants, exclusive breastfeeding or extensively or partially hydrolyzed formula for at least 4 months may be protective.
- No evidence for use of soy formula in the prevention of atopic disease.
- No evidence that delaying introduction of solid food beyond age 4-6 months prevents atopic disease.

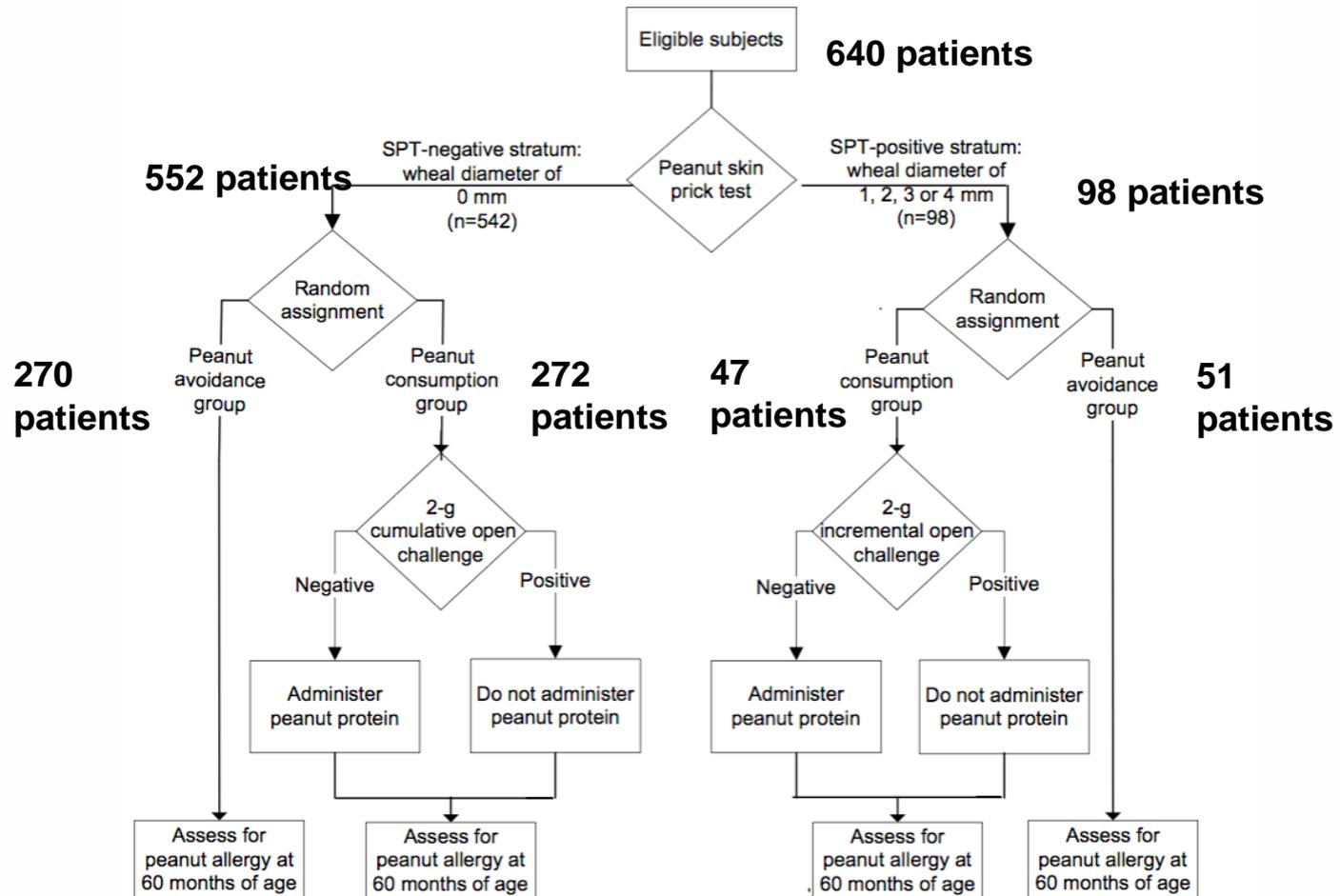
Key Point: Antihistamines will not block anaphylaxis

- Unfortunately, reaction severity CANNOT be predicted to again be mild with the next episode
 - In a United Kingdom series of anaphylaxis fatalities, 1/3 of food allergy deaths were in patients with such mild reactions to foods (mainly peanuts/tree nuts) that they had not been prescribed self-injectable epinephrine*
 - Consider self-injectable epinephrine for all at risk of anaphylaxis

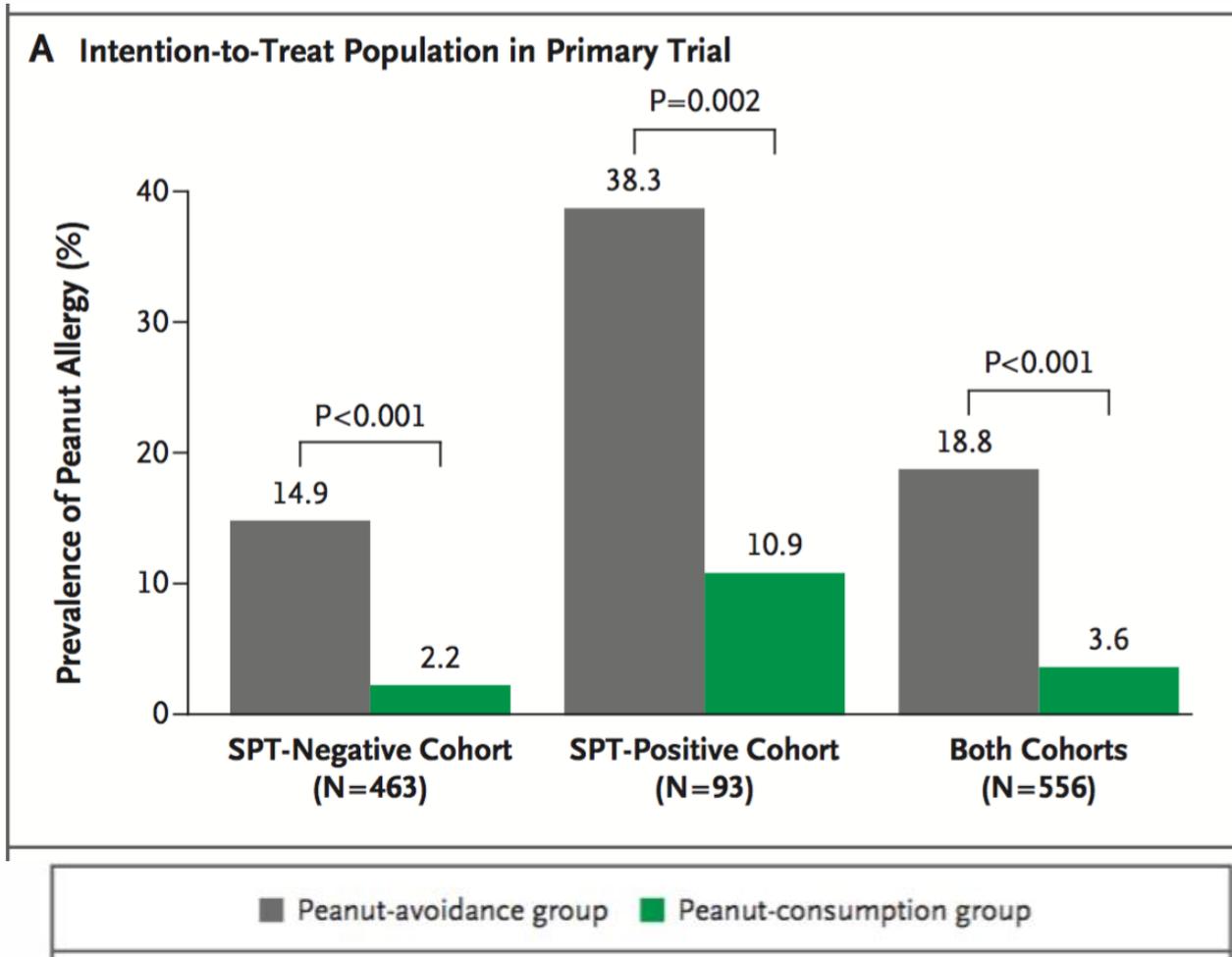
MYTH: Prior Episodes Predict Future Reactions

- No predictable pattern
- Severity depends on:
 - Sensitivity of the individual
 - Dose of the allergen
 - Other factors (e.g., food matrix effects, exercise, concurrent medications, alcohol, airway hyper-responsiveness)
- Must always be prepared for an emergency
- However, if there has been a previous severe episode then inject epinephrine immediately and call 911¹

Study Design

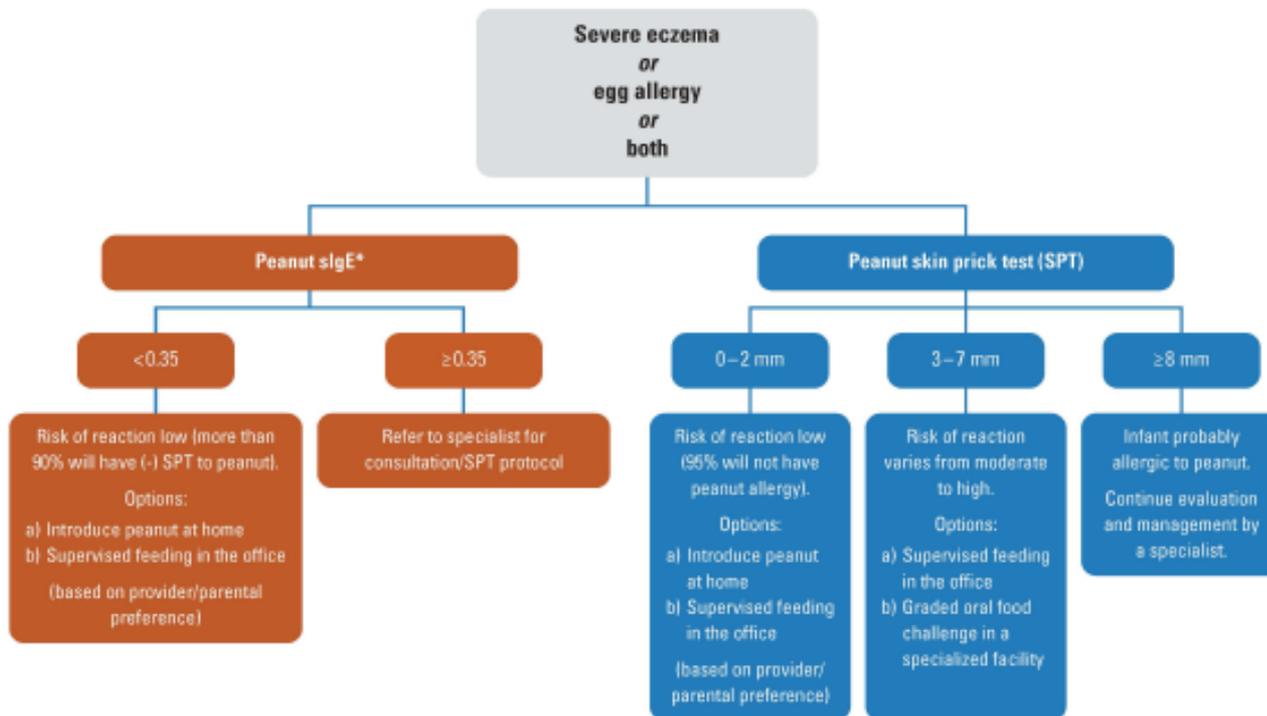


The prevalence of peanut allergy at 60 months



Screening

Recommended Approaches for Evaluation of Children With Severe Eczema and/or Egg Allergy Before Peanut Introduction



*To minimize a delay in peanut introduction for children who may test negative, testing for peanut sIgE may be the preferred initial approach in certain healthcare settings. Food allergen panel testing or the addition of sIgE testing for foods other than peanut is not recommended due to poor positive predictive value.

conclusions

- Food allergies have been rising over the past decade
- Foods can cause a variety of clinical symptoms—
HISTORY is KEY
- Avoid panels of foods. Use history to guide testing.
- Remember that false positives occur
- Prescribe Epinephrine and review food action plan.
- If in doubt about history or testing, challenge to food (let me do it)
- Screen for peanut in severe peanut allergy and introduce peanut in infancy if possible.

Questions?



Immunologic and Non-Immunologic Food Reactions

2 week old, breast fed-infant presents with blood in the stool.

- The blood was first noted at 1 week of life and has been progressing.
- Now every stool is streaked with bright red blood.
- The infant is otherwise in no distress.
- He weighs more than his birth weight.
- Physical examination is unremarkable; an anal fissure is not present.

What would be your advice to his mother?

- A. Stop breast feeding immediately and switch to a soy formula
- B. Stop breast feeding immediately and switch to an amino acid formula.
- C. Discuss cow's milk elimination diet for the mother and encourage continuation of breast feeding.
- D. Refer to a pediatric gastroenterologist for possible colonic biopsies.

Answer C

- Allergic proctocolitis typically presents in the first few weeks to months of life, commonly in breast fed infants.
 - Likely due to cow's milk proteins consumed by the mother
 - Elimination of cow's milk from the mother's diet → resolution of symptoms and continue breast feeding
 - If bleeding does not resolve with maternal dietary manipulation → change to a casein hydrolysate formula, or in rare instances, an amino acid based formula (resolution of symptoms within 48-72 hours)

Non-IgE mediated food allergies

	Enterocolitis (FPIES)	Enteropathy	Proctocolitis
Age Onset:	Infant	Infant/Toddler	Newborn
Duration:	12-24 mo	? 12-24 mo	9 mo-12 mo
Characteristics:	Failure to thrive Shock Lethargy Emesis Diarrhea	Malabsorption Villous atrophy Diarrhea	Bloody stools No systemic sx Well baby

Typically milk and soy induced

Spectrum may include colic, constipation and occult GI blood loss

* More than 50% of proctocolitis cases have been reported in breast-fed infants

FPIES manifestations

TABLE IV. Diagnostic criteria for patients presenting with possible FPIES

Acute FPIES

Major criterion:

Vomiting in the 1- to 4-h period after ingestion of the suspect food and absence of classic IgE-mediated allergic skin or respiratory symptoms

Minor criteria:

1. A second (or more) episode of repetitive vomiting after eating the same suspect food
2. Repetitive vomiting episode 1-4 h after eating a different food
3. Extreme lethargy with any suspected reaction
4. Marked pallor with any suspected reaction
5. Need for emergency department visit with any suspected reaction
6. Need for intravenous fluid support with any suspected reaction
7. Diarrhea in 24 h (usually 5-10 h)
8. Hypotension
9. Hypothermia

The diagnosis of FPIES requires that a patient meets the major criterion and ≥ 3 minor criteria. If only a single episode has occurred, a diagnostic OFC should be strongly considered to confirm the diagnosis, especially because viral gastroenteritis is so common in this age group. Furthermore, although not a criteria for diagnosis, it is important to recognize that acute FPIES reactions will typically completely resolve over a matter of hours compared with the usual several-day time course of gastroenteritis. The patient should be asymptomatic and growing normally when the offending food is eliminated from the diet.

Chronic FPIES

Severe presentation: When the offending food is ingested on a regular basis (eg, infant formula); intermittent but progressive vomiting and diarrhea (occasionally with blood) develop, sometimes with dehydration and metabolic acidosis.

Milder presentation: Lower doses of the problem food (eg, solid foods or food allergens in breast milk) lead to intermittent vomiting and/or diarrhea, usually with poor weight gain/FTT but without dehydration or metabolic acidosis.

The most important criterion for chronic FPIES diagnosis is resolution of the symptoms within days after elimination of the offending food(s) and acute recurrence of symptoms when the food is reintroduced, onset of vomiting in 1-4 h, diarrhea in 24 h (usually 5-10 h). Without confirmatory challenge, the diagnosis of chronic FPIES remains presumptive.

Food protein-induced proctocolitis (allergic proctocolitis)

- Early infancy, 60% breast-fed, 40% milk and soy formula
- Blood-streaked stools in otherwise well infants, occasional anemia
- Rarely mild hypoalbuminemia and peripheral eosinophilia
- Biopsy: distal large bowel, linear erosions, mucosal edema, infiltration of eosinophils in the epithelium and lamina propria
- Resolves promptly with casein hydrolysate formula (e.g. Alimentum, Nutramigen)
- Most tolerate milk and soy after 1st year



A 6-month old breast-fed baby developed severe, repetitive vomiting on several occasions.

- Admitted twice for dehydration and sepsis work up due to lethargy. His symptoms resolved with intravenous re-hydration and bowel rest.
- No infectious causes were identified for any of the episodes.
- He developed emesis and diarrhea when cow milk formula was supplement in the first week of life
- He has some yellow fruits and vegetables in the past without problems.
- It was recalled that one of his reactions followed a feeding of cow milk formula mixed with rice cereal

Please choose one correct statement regarding this child's allergic disorder:

- A. Conventional allergy tests (SPT, serum food-specific IgE) are usually positive and food re-introduction may be done at home, based on the results of the allergy tests.
- B. Epinephrine is the first line of therapy.
- C. Milk, soy, rice, and oat have been reported as a culprits in infants.
- D. Symptoms start within minutes following food ingestion.

Answer C

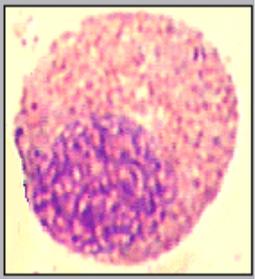
- FPIES is presumed to be mediated by cellular mechanisms that cause severe intestinal inflammation with third spacing.
- Most common triggers: Cow milk and soy
 - Rice and oat also have been reported
- Symptoms usually start within 2-3 hours of food ingestion
- Food Specific IgE are usually negative
 - Not helpful in determining the status of tolerance.
- In a child with history of convincing reaction, reintroduction of the food is typically done following about 12-18 months of asymptomatic period, under physician supervision, with secure intravenous access.
- First line therapy:
 - Vigorous intravenous hydration
 - Intravenous methylprednisolone is used in severe reactions empirically

Mixed IgE and non-IgE mediated food allergy

- Atopic dermatitis
- Eosinophilic gastroenteropathy:
 - Esophagitis
 - Gastritis
 - Gastroenteritis

Atopic dermatitis

- 35% of children with moderate-severe atopic dermatitis have food allergies as a trigger.
- Usually chronic-relapsing course without any clear-cut symptoms to the food ingested on a regular basis
- Removal of the food for ~7-14 days: acute symptoms may be seen during the oral food challenge
- Removal of culprit foods results in significant improvement in skin symptoms
 - Trial ONLY after proper skin care regimen has been attempted



Eosinophilic Esophagitis (EoE)

- Symptoms of EoE (chronic, relapsing, no progression to other GI pathology)¹
 - Post-prandial N/V/D/abdominal pain, weight loss
 - GER, often refractory
 - FTT in infants and young children, irritability, sleep disturbance
 - In teens/adults: dysphagia, food impaction (due to esophageal strictures)
- Symptoms do not correlate with severity of eosinophilic infiltration in esophagus tissues: mucosa → serosa
- Diagnostic criterion for EoE: eos >15 /high power field²

Eosinophilic Esophagitis (EoE) – endoscopic findings



Eosinophilic Esophagitis: Role of Food Allergy

- 50-80% of children with EoE have ≥ 1 food-sIgE detectable by immunoassay or SPT¹
- Response to specific food elimination found in a subset of patients²
- Elemental diet effective in >90% of cases of EoE^{3,4}

¹Spergel J, et al J Pediatric Gastroenterol Nutrition, 2009;48:30-36.

²Kagalwalla, AF et al, Clin Gastroenterol Hepatol 2006;4: 1097-1102.

³Kelly KJ, et al, Gastroenterology, 1995;109:1503-15.

⁴Assa'ad A, et al; JACI 2007; 731-8.

14-year old boy presents to the ER with sensation of food stuck in his throat.

- An emergency endoscopy removes a piece of chicken lodged in his esophagus.
- He is referred to an allergist for evaluation.
- PMH is significant for frequent complaints of “food gets stuck in my throat” especially with chicken and turkey but also with any hard food.
- He has spring and fall allergic rhinitis and mild intermittent asthma.
- He is on unrestricted diet but has been on Alimentum (extensively hydrolyzed formula) in the first 18 months of life due to symptoms of gastroesophageal reflux.

What is the most appropriate next step?

- A. Do allergy SPT and blood IgE to chicken and turkey; if positive eliminate from diet.
- B. Refer to a gastroenterologist for endoscopy and biopsy.
- C. Perform skin tests to all foods in the diet and eliminate those with positive tests for at least 8 weeks.
- D. Prescribe a 6 week trial of swallowed inhaled fluticasone.

Answer B

- Endoscopy and biopsy are necessary to confirm EoE diagnosis prior to extensive dietary manipulations or other therapeutic interventions such as swallowed inhaled fluticasone.
- In children, histologic improvement in:
 - 76% children with elimination of the six common foods: cow's milk, soybean, wheat, egg, peanut, and seafood
 - 88% with elemental formula (Kagalwalla, et al, 2006)
 - 75% with an elimination diet based on the combined SPT and atopy patch test (Spergel, et al, 2005). (no one has been able to duplicate)
- Esophageal strictures may complicate eosinophilic esophagitis (EoE). Many subjects with emergency food impaction have EoE
- Food impaction, atopic background, asthma, and history of GER in infancy, suggest that EoE is likely.