Goal of Program: To improve outcomes for all children with asthma, allergy and anaphylaxis via the provision of comprehensive team-based, family-centered care and effective co-management between primary and subspecialty care settings.

PRESENTERS: Ruchi Gupta, MD, MPH, FAAP, FAAAAI
John Lee, MD, FAAAAI
Michael Pistiner, MD, MMSc, FAAP, FAAAAI, FACAAI

NIAID Guidelines for the Diagnosis and Management of Food

- NIAID collaboration to offer concise guidelines for healthcare professionals
- Recommendations on
  - Diagnosis
  - Testing
  - Management non-life-threatening allergic reactions
  - Diagnosis and management of food induced anaphylaxis
- Offered in full guidelines, summary for healthcare professionals and summary for parents and caregivers

http://www.niaid.nih.gov/topics/foodallergy/clinical/Pages/default.aspx
Learning Objectives

- **Definition & Epidemiology**
- Physical Examination & Clinical History
- Diagnostic Testing
- Food Allergy Management
  - Epinephrine
  - Education
- Referral to an Allergist

Definitions

- **Food allergy**: An adverse health effect arising from a specific immune response that occurs reproducibly on exposure to a given food.

- **Anaphylaxis**: A serious allergic reaction that is rapid in onset and may cause death.

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Prevalence

3-8% of U.S. children have a food allergy

Presenter: R. Gupta


Prevalence

Most common childhood (<18 yo) food allergens:

Prevalence of Anaphylaxis

• “Studies found wide differences in the rates (from 1/100,000 population to as high as 70/100,000 population) of hospitalization or emergency department visits for anaphylaxis.”

• “The proportion of anaphylaxis cases thought to be due to foods varies between 13% and 65%.”

-NIAID

Prevalence of Food Allergies

<table>
<thead>
<tr>
<th></th>
<th>Peanut</th>
<th>Shellfish</th>
<th>Tree Nut</th>
<th>Milk</th>
<th>Egg</th>
<th>Wheat</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 – 2 years (n=5429)</td>
<td>22.2</td>
<td>7.5</td>
<td>5.4</td>
<td>31.5</td>
<td>15.8</td>
<td>4.0</td>
</tr>
<tr>
<td>3 – 5 years (n=5910)</td>
<td>30.3</td>
<td>12.9</td>
<td>14.3</td>
<td>22.1</td>
<td>13.7</td>
<td>5.0</td>
</tr>
<tr>
<td>6 – 10 years (n=9911)</td>
<td>25.5</td>
<td>17.1</td>
<td>14.3</td>
<td>19.6</td>
<td>11.1</td>
<td>5.0</td>
</tr>
<tr>
<td>11 – 13 years (n=6716)</td>
<td>28.1</td>
<td>20.4</td>
<td>15.2</td>
<td>17.7</td>
<td>6.6</td>
<td>8.2</td>
</tr>
<tr>
<td>14-17 years (n=10 314)</td>
<td>20.2</td>
<td>23.8</td>
<td>13.4</td>
<td>18.4</td>
<td>4.1</td>
<td>3.3</td>
</tr>
</tbody>
</table>

**Associations of Race & Income**

<table>
<thead>
<tr>
<th>Black and Asian race</th>
<th>Hispanic race</th>
<th>Household income &lt;$50k</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Higher odds of having a food allergy (Black race OR=1.8; Asian race OR=1.4)</td>
<td>• Lower odds of being diagnosed by a physician (OR=0.8)</td>
<td>• Lower odds of having a food allergy (OR=0.5)</td>
</tr>
<tr>
<td>• But lower odds of being diagnosed by a physician (Black race OR=0.8; Asian race OR=0.7)</td>
<td></td>
<td>• Lower odds of being diagnosed by a physician (OR=0.5)</td>
</tr>
</tbody>
</table>

*All P<.05

**Food Allergies Can Be Severe**

- 39% Children who have experienced a severe reaction

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All Foods Cause Severe Reactions

Percentage of Food-Specific Reactions classified as severe


Developing Tolerance to Food

- **Tolerance**: Individual is symptom free after consumption of the food or upon oral food challenge weeks, months, or even years after the cessation of treatment.

- Studies indicate that:
  - 82% of patients were tolerant to egg by age 16
  - 69% of patients were tolerant to soy by age 10
  - 65% of patients were tolerant to wheat by age 12
  - 80% of patients were tolerant to milk by age 5

Comorbid Conditions

- Food allergic children are 2 to 4 times more likely than those without food allergies to have related conditions such as:
  - Asthma (4.0 fold)
  - Atopic dermatitis (2.4 fold)
  - Respiratory allergies (3.6 fold)


Geographic Variability

Using the same data, described geographic variability in the US:

- North-to-South decline not observed
- Odds of food allergy significantly higher at more southern and middle latitudes compared to northern states (OR 1.5, 95% CI 1.3-1.8 & OR 1.3, 95% CI 1.1-1.5)


Urban Centers: 9.8%
Urban Outskirts: 9.2%
Suburban Areas: 7.8%
Small Towns: 7.6%
Rural Areas: 7.2%

Economic Impact:

Total Annual Cost per Child: $4,184
Total Annual Cost In the U.S.: $24.8 billion

### High Cost of Food Allergies

#### Annual Costs, US$

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Total (in Billions)</th>
<th>Per Child</th>
<th>Total (in Billions)</th>
<th>Per Child</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs borne by families</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Out-of-pocket treatment</td>
<td>5.5</td>
<td>931</td>
<td>(4.7-6.4)</td>
<td>(793-1080)</td>
</tr>
<tr>
<td>Lost labor productivity</td>
<td>0.77</td>
<td>130</td>
<td>(0.53-1.0)</td>
<td>(89-175)</td>
</tr>
<tr>
<td>Opportunity</td>
<td>14.2</td>
<td>2399</td>
<td>(10.5-18.4)</td>
<td>(1771-3104)</td>
</tr>
<tr>
<td>Total</td>
<td>20.5</td>
<td>3457</td>
<td>(16.7-24.9)</td>
<td>(2816-4208)</td>
</tr>
<tr>
<td>Reported costs borne by families</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct medical costs</td>
<td>4.3</td>
<td>724</td>
<td>(2.8-6.3)</td>
<td>(472-1063)</td>
</tr>
<tr>
<td>Reported costs</td>
<td>24.8</td>
<td>4184</td>
<td>(20.6-29.4)</td>
<td>(3475-4960)</td>
</tr>
</tbody>
</table>

#### Presentation Summary

**Learning Objectives**

- **Definition & Epidemiology**
- **Physical Examination Clinical History**
- **Diagnostic Testing**
- **Food Allergy Management**
  - Epinephrine
  - Education
- **Referral to an Allergist**
Evaluating a child with symptoms

1. Is this an allergy or intolerance?

2. If this is a suspected allergy, is it IgE or non-IgE mediated?

3. If this is suspected IgE-mediated reaction, then consider allergist referral and confirmation with allergy testing.

Classification of Food Reactions

Adverse Food Reaction

Non-Immune Mediated

Immune Mediated

Non-IgE Mediated

Mixed IgE & Non-IgE Mediated

IgE Mediated

Food Unrelated

Food Related

Adapted from Fig 1 NIAID
Non-Immune Mediated: Food intolerances

- Lactose Intolerance
- Food poisoning
- Irritable Bowel Syndrome
- Carbohydrate Malabsorption
- Scombroid

Non-IgE Mediated Reactions

- Cow’s Milk Protein Proctocolitis (Milk Protein Allergy of Infancy)
- FPIES (Food Protein Induced Enterocolitis Syndrome)
- Heiner’s Syndrome (milk pulmonary hemosiderosis)
- Celiac Disease/Gluten Sensitivity
- Chronic Idiopathic Urticaria
Mixed IgE & Non-IgE Mediated Reactions

- Severe Atopic Dermatitis
- GI Conditions – Eosinophilic Esophagitis

Food Unrelated, IgE-Mediated Conditions

- Asthma
- Allergic Rhinitis
**Food Related, IgE-Mediated Conditions**

- Immediate reaction following food exposure
  - Anaphylaxis
  - Acute Urticaria
- Non-acute allergic reactions
  - E.g. definitive history of eczema flaring with food exposure

**Getting the Clinical History**

**Questions to Ask for IgE Mediated Allergy**
**Physical Examination**

No findings are diagnostic of a food allergy

*Exam can provide evidence of atopy*

- *Urticaria or eczema*
- *Dermatographism*
- *Rhinitis*
- *Wheezing*

---

**Getting the Clinical History:**

*Triggers*

What foods are suspected to trigger the reaction?

*Inquire about*

- *Common allergens as obvious or hidden ingredients*
- *Possible sources of cross-contact*
- *Routes of suspected exposure*

_Virtually all reactions occur through ingestion_
Getting the Clinical History: Timing

How soon did symptoms appear after suspected exposure?

- *Typically within 30 minutes*
- *Majority within 2 hours*

Getting the Clinical History: Symptoms

What were the symptoms of the reaction?
Diagnostic Criteria for Anaphylaxis

The symptoms of anaphylaxis vary and can be difficult to recognize. If you experience any ONE of the following three conditions, you may be experiencing an anaphylactic episode:

- Your symptoms appear within minutes to several hours and involve skin, mucosal tissue (moist lining of the body cavities, such as the nose, mouth, and GI tract), or both. You also have trouble breathing or a drop in blood pressure (pale, weak pulse, confusion, loss of consciousness).

or

- You have two or more of the following symptoms that occur within minutes to several hours after exposure to a suspected allergenic food:
  - Hives, itchiness, or redness all over your body and swelling of the lips, tongue, or the back of the throat
  - Trouble breathing
  - Drop in blood pressure
  - GI symptoms such as abdominal cramps or vomiting

or

- Your blood pressure drops, leading to weakness or fainting, within minutes to several hours after exposure to a food to which you know you have an allergy.

Excerpted from NIAID Summary for Patients p. 25

Getting the Clinical History: Route of Exposure

What is the route of exposure of the suspected food allergen?

- *Ingestion is the cause of almost all severe allergic reactions*
- *Inhalation is a rare cause*
- *Exposure to intact skin rarely results in systemic symptoms*
**Getting the Clinical History:**

**Reproducibility**

Do symptoms recur with re-exposure?

- *Allergic reactions are typically reproducible with same food exposure*
- *Unlikely to be a trigger, if currently tolerating same amount of food without symptoms*

---

**Getting the Clinical History:**

**Co-factors**

What else was going on around the time of the reaction?

- *Other factors can increase severity of or reduce threshold for symptoms*
- *Exercise, viral illness, alcohol, NSAIDS, menstruation, etc. may affect reaction*
Getting the Clinical History: Treatment

How was the reaction treated?

Inquire about

• Use of epinephrine, antihistamines, other medications
• Improvement of symptoms after treatment

Getting the Clinical History: Resolution of Symptoms

How quickly did symptoms clear after the food was avoided?

Symptoms should resolve after removal of suspected allergen
Should you pursue allergy testing?

Should not continue with allergy testing
- Non-Immune Reactions
  e.g. lactose intolerance, irritable bowel syndrome
- Non-IgE Reactions
  e.g. chronic idiopathic urticaria, cow’s milk proctocolitis

Recommend referral to allergist for evaluation
- Mixed IgE & Non-IgE Mediated reactions
  e.g. eosinophilic esophagitis, atopic dermatitis

Consider testing or referral to allergist
- IgE Mediated reactions
  e.g. food related anaphylaxis and urticaria

Learning Objectives
- Definition & Epidemiology
- Physical Examination & Clinical History
- Diagnostic Testing
- Food Allergy Management
  – Epinephrine
  – Education
- Referral to an Allergist
Selection of Foods to Test

• Choose foods to evaluate based upon history of exposure

• Avoid Food Allergy Panels

• Do not test a food if currently tolerated in the diet

Types of Allergy Testing

• Testing that may be ordered by a pediatrician
  – Specific IgE testing

• Testing should only be done by a board certified allergist
  – Skin testing
  – Oral food challenge
Avoid non-standardized test for food allergy evaluation

- Allergen-specific IgG testing
- Basophil histamine release/activation
- Lymphocytes stimulation
- Mediator release assay (LEAP diet)
- Cytotoxic assays
- Others

Specific IgE (sIgE) Testing

- Previously called “RAST” which is outdated assay

- Commonly referred to as “ImmunoCAP”

- Serum test used to detect IgE antibodies to specific allergens i.e. foods
Interpreting sIgE Test Results

Sensitization vs. allergy

- **Sensitization**: presence of allergen-specific IgE to food allergens without having clinical symptoms on exposure to those foods
- **sIgE-mediated food allergy** requires *both* the presence of sensitization *and* the development of specific signs and symptoms on exposure to that food

*A positive sIgE test result is not sufficient to confirm an allergy*

---

Interpreting sIgE Test Results

Additional Points

High negative predictive value in ruling out IgE mediated allergies

Higher sIgE result predicts probability, not severity, of true reaction

*Myth: >100 kU/L means my child is at high risk for a life threatening reaction*
95% PPV sIgE Cutoff Values

<table>
<thead>
<tr>
<th>Food</th>
<th>Serum IgE (kU/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Egg</td>
<td>≥7</td>
</tr>
<tr>
<td>Egg (&lt; 2 yrs)</td>
<td>≥2</td>
</tr>
<tr>
<td>Cow's milk</td>
<td>≥15</td>
</tr>
<tr>
<td>Cow's milk (&lt; 2 yrs)</td>
<td>≥5</td>
</tr>
<tr>
<td>Peanut</td>
<td>≥14</td>
</tr>
<tr>
<td>Fish</td>
<td>≥20</td>
</tr>
</tbody>
</table>


Skin Prick Testing

- Allergens in a diluent is pricked on the skin, then evaluated for an immediate wheal and flare response

- Size of wheal predicts probability of reaction when exposed to allergen

- Has high sensitivity and negative predictive value

- Should only be performed by a board certified allergist
Oral Food Challenge

- Most definitive test to confirm or rule-out food allergy
- Typically used to evaluate if a child may have outgrown a prior food allergy, or when a food allergy diagnosis is in question
- Should only be performed under supervision of a board-certified allergist with appropriate emergency medical treatment and services available

NIAID 4.2.2.8

Oral Food Challenge: Baked milk & egg products

- Some with milk/egg allergies may tolerate extensively baked, heat-denatured foods
- Only to be done under the direction of an allergist
  - No established guidelines to determine when to challenge but depend on combination of history, sIgE and skin test results
  - Anaphylaxis has occurred with these challenges

NIAID 4.1.2
Key Points in Allergy Evaluation

• Consider food allergies **only** in cases of an immediate reaction following food exposure i.e. hives or anaphylaxis

• Avoid screening patients with food allergy panels

• Understand difference between sensitization and true allergy when interpreting test results

• Refer and collaborate with an allergist for management of food allergies

Learning Objectives

• **Definition & Epidemiology**
• Physical Examination & Clinical History
• Diagnostic Testing
• **Food Allergy Management**
  – Epinephrine
  – Education
• **Referral to an Allergist**
Management of IgE Mediated Food Allergy

- Written action plan with provision of 2 doses of epinephrine (NIAID 6.4)
- Patient/Family Education
- Consideration for emergency identification jewelry (NIAID 6.4.2.1)
- Monitor nutritional and growth status and provide nutritional counselling (NIAID 5.1.4)

Learning Objectives

- Definition & Epidemiology
- Physical Examination & Clinical History
- Diagnostic Testing
- Food Allergy Management
  - Epinephrine
  - Education
- Referral to an Allergist
Epinephrine

• **First-line** treatment for anaphylaxis.

• Delays in administration associated with increased mortality

Epinephrine: Frequency

• If symptoms progress or poor response then repeat dosing after 5 to 15 minutes
• 10% to 20% may require greater than one dose

(Simons. JACI 109: 171-175, 2002), (NIAID 6.3.1.1.)


NIAID 6.3.1.1
Epinephrine: Dosing

- Recommended dosing is 0.01mg/kg up to 0.5mg IM (DO NOT PUSH IV)
  - 1:1000 epinephrine (1mg/ml)

- Auto-injectors: Two available doses
  - 0.3mg
  - 0.15mg
  - Upsize to 0.3mg for >=25kg (55lb)

Anaphylaxis Practice Parameters. JACI.2005
Muraro A. et Al. Mgmt. Anaph childhood. Allergy 2007
Sampson et al. JACI 2006;117:391-7

Epinephrine: Prescriptions

- Specific Child
  - Enough to ensure that 2 doses are available in all situations

- Non-specific/Stock Epinephrine
  - Standing orders for school for availability of 2 doses of 0.15mg and 0.3mg dosing

NIAID 6.4.2.2
Epinephrine: Available Auto-injectors

Currently 4 auto-injectors available in US
(As of November 2014)
Online video training available

Epinephrine: Availability and Storage

- Readily available at **ALL** times (unlocked)

- Avoid Extreme temperatures
  - Keep at 15-30° C (59-86° F)
  - Do not store in car

- Monitor auto-injector expiration dates (**NIAID 6.4.2.3.**)

**EXP MAY 15**
Epinephrine: Common & Expected Side Effects

- Pallor (100%)
- Tremor (80%)
- Anxiety (70%)
- Tachycardia (50%)
- Headache (20%)
- Nausea (20%)

Knowing what to expect may decrease the fear of the unknown and may decrease reservations in administering epinephrine.

(Simons. JACI 109: 171-175, 2002)

Epinephrine: Contraindications/Considerations

- **No contraindication** if treatment for anaphylaxis
- Caution with cardiac issues, arrhythmias, uncontrolled hypertension or hyperthyroidism, aortic aneurysm, recent intracranial surgery and patients on sympathomimetics, TCAs, MAO inhibitors
- Beta blockers decrease response to epinephrine

Discuss with comanaging medical teams and coordinate patient centered approach

(NIAID 6.3.3)
(Anaphylaxis Practice Parameters. JACI.2005)
(Sicherer and Simons. Pediatrics. 2007; 119;638-646)
**Epinephrine: Considerations with asthma**

- If ever any concern that a food allergic reaction has triggered an asthma attack then treat with epinephrine first

- Delays in epinephrine use are associated with increased risk of death

---

**Antihistamines**

“The use of antihistamines is the most common reason reported for not using epinephrine and may place a patient at significantly increased risk for progression toward a life-threatening reaction.”

—**NIAID 6.3.1.**

Antihistamines

- Antihistamines are not first line treatment of anaphylaxis and do not stop or prevent it
- Slow to act (30-60 minutes)
- Non-licensed responders may not be able to give antihistamines in some states and schools

(Young. Pediatric Allergy: Principles and Practice 643-653. 2003)
(Sampson et al. JACI 2006;117:391-7)
(Muraro A. Et Al. Mgmt. Anaph childhood. Allergy 2007)

Learning Objectives

- Definition & Epidemiology
- Physical Examination & Clinical History
- Diagnostic Testing
- Food Allergy Management
  - Epinephrine
  - Education
- Referral to an Allergist
Food Allergy Management Education:
Challenges

- **Limited education time**
  - Not enough time to become competent or confident in food allergy management
  - Large Volume of Information
  - Significant Lifestyle Changes
  - Train the trainer

- **Studies of parental knowledge demonstrate clear deficits in**
  - Competency in epinephrine administration (Arkwright, et al. Pediatric Allergy Immunology 2006;17(3):227-9) (Pouessel, et al. Pediatric Allergy Immunology 2006; 17(3):221-6)
  - Allergen avoidance (Joshi, et al. JACI. 2002;109(6):1019-21)

- **Misperceptions and assumptions**
  - Skin test size, level of IgE, air borne exposure, skin contact, danger of epinephrine, etc.

Emotional and Social Impact of Food Allergy

- **Fear of adverse events and death**
- **Fear of ridicule**
- **Social isolation**
- **Limitations in activities**
- **Food Allergy Related Bullying**
Food Allergy Management: A Difficult Balance

Anxiety  Risk Taking

Allergic reactions can be prevented and dealt with reasonably while maintaining quality of life

Teach Food Allergy Basics

Definition
Specific Food Allergens
Symptoms

(Munoz-Furlong et al. Nutrition Guide To Food Allergies. FAAAN, 2005)
(Sampson, HA, Hospital Practice, 2000)
(Food Allergy Practice Parameter. Annals of Allergy, Asthma & Immunology, 2006)
(Mass Dept of Education. Managing Life Threatening Food Allergies in Schools, 2002)
Teach Food Allergy Basics

Timing
Anaphylaxis
Epinephrine

Let them know that symptoms can progress quickly. Tell them about anaphylaxis and how prompt treatment with epinephrine is key.

(Munoz-Furlong et al. Nutrition Guide To Food Allergies. FAAN. 2005)
(Sampson, HA, Hospital Practice, 2000)
(Food Allergy Practice Parameter. Annals of Allergy, Asthma & Immunology. 2006)

Food Allergy Fatal and Near Fatal Anaphylaxis

• Most away from the home
• Unintentional ingestion with known food allergy
• Majority are peanut & tree nut
• Asthma is a significant risk factor
• Adolescents and young adults are at greatest risk
  - 70% of mortalities between ages 12 and 21
• Delayed or lack of administration of epinephrine
  – 88% of fatalities

(Bock JACI 2001;107:191)
(Bock JACI 2007;119:4:1016-18)
(Sampson et al. JACI 2006;117:391-7)
(CDC, Voluntary Guidelines for Managing Food Allergies. 2013)
Pillars of Food Allergy Management

Prevention

Emergency Preparedness

These must be applied at all times and in all settings
**Routes of Food Allergen Exposure**

- Oral
- Inhalation
- Skin Contact

**Avoid Oral Exposure**

- Each label on food should be read every time
- Understand labeling laws (FALCPA) and their limitations
- Avoid items with advisory statements (some exceptions)
- Be familiar with hidden ingredients

Sources:

- Hefle et al. JACI 2007
- Munoz-Furlong et al. Nutrition Guide To Food Allergies. FAAN, 2005
Avoid Oral Exposure

- Each label on food should be read every time
- Understand labeling laws (FALCPA) and their limitations
- Avoid items with advisory statements (some exceptions)
- Be familiar with hidden ingredients

Provide resources and training to read labels. It’s not as easy as it seems.

Skin Contact

- Isolated skin contact on intact skin did not cause severe or systemic reactions in two studies, although milder reactions occurred
- Skin contact can easily turn into an oral or mucosal exposure especially in young children
- Systemic reactions have been reported in cases of topical application of allergen on eczematous skin

(Wainstein. Pediatric Allergy Immunology 2007; 18:231-9)
(Bahna. Allergy 2004: 59 (Suppl. 78): 66–70)
Inhalation

• Smells are caused by VOCs, not proteins

• No systemic reactions in small study of peanut allergic patients with peanut butter held 1 foot from nose

• Reactions of inhalation of fish, egg, legumes, buckwheat, milk, and others, associated with active cooking

• Caution with powders, flours, small particles of food, etc.

(Roberts Allergy. 2002)
(Simonte, et al, JACI 1999)

Cross-contact

• Allergens can be transferred by objects, saliva, and food

• Exposure to small amounts of allergen is enough to cause a serious allergic reaction

• Allergens withstand heating and drying

• Routine training for all caregivers about sources of cross-contact and prevention of exposure is essential

• Saliva and pets can be a source of cross contact

• Be aware of the developmental level and capabilities of the child

• Different issues with different age groups

(Maloney. JACI. 2006)
Cross-contact

- Exposure to small amounts of allergen is enough to cause a serious allergic reaction.
- Allergens withstand heating and drying.
- Routine training for all caregivers about sources of cross-contact and prevention is essential.
- Be aware of the developmental level and capabilities of the child.
- Different issues with different age groups.

(Maloney. JACI. 2006)

Provide resources and training to prevent cross contact.

Cleaning to Prevent Cross-Contact

- Establish a cleaning protocol to avoid cross-contact.

What Works: Soap and water, commercial hand wipes

What Doesn’t: Hand sanitizers

What Works: Soap and water, commercial cleaners, commercial wipes

(Perry et al 2004)
Prevention Take Home Points

Read Labels

Prevent Cross-contact

Avoid Hidden Ingredients

Pillars of Food Allergy Management

These must be applied at all times and in all settings
ANAPHYLAXIS

“a serious allergic reaction that is rapid in onset and may cause death”

Food Allergy and Anaphylaxis Emergency Care Plan

- Simplified criteria to identify potential allergic emergencies for use by patients, families, caregivers and school staff
- Accessible and understandable
- Strongly encourage submission to school/daycare
- Train families to use ECPs when they train others
Food Allergy and Anaphylaxis
Emergency Care Plan

- Simplified criteria to identify potential allergic emergencies for use by patients, families, caregivers and school staff
- Accessible and understandable
- Encourage submission of care plans to use ECPs when train others

Clearly Convey the Critical Role of Epinephrine

- First-line, treatment of choice
- Acts where we need it to
- Will make you feel better
- Fast acting
- Delays in administration increase risk of death
- Err on the side of caution and give if any doubt
- Safe medicine
Auto-injector Trainors

• Anyone responsible for caring for a child with a potentially life threatening allergy should be trained using the specific trainer prescribed and get comfortable with use.

• When developmentally appropriate children should practice with trainers as well.

Call 911 for Suspected Anaphylaxis

• Caller should state that child having anaphylaxis and request licensed responders that can administer epinephrine.

• It is strongly suggested that the child be taken to the Emergency Department via Ambulance (child may need additional care or experience a biphasic reaction).

• After epinephrine is administered and after 911 called, then call emergency contacts as per emergency care plan.

• If possible keep the child from rising to an upright position. Consider supine positioning with legs elevated if comfortable and appropriate, but caution with vomiting and respiratory distress.

(Sampson et al. JACI 2006;117:391-7)
(Pumphrey. JACI. 2003;112:451-2)
(Guidance for Managing Food Allergies in Schools And Licensed Early Care and Ed. Programs. 2012)
Bust Anaphylaxis Myths

Presenter: M. Pistiner

[Images of syringe, ambulance, measuring cup, and rash]

Bust Anaphylaxis Myths

Presenter: M. Pistiner

[Images with a prohibition symbol over them]
Bust Anaphylaxis Myths

**Myth vs. Fact**

**Food Allergy Myth**

“GIVE ANTHISTAMINE FIRST”

**Food Allergy Fact**

Epinephrine is the treatment of choice for anaphylaxis

---

Bust Anaphylaxis Myths

**Myth vs. Fact**

**Food Allergy Myth**

“YOU NEED TO CALL AN AMBULANCE BECAUSE EPINEPHRINE IS DANGEROUS”

**Food Allergy Fact**

Calling an ambulance is important because it was a bad enough reaction to need epinephrine and more treatment may be necessary.
Bust Anaphylaxis Myths

**Myth vs. Fact**

**Food Allergy Myth**

“The needle is huge”

**Food Allergy Fact**

The needle is shorter than the width of a dime.

**Bust Anaphylaxis Myths**

**Food Allergy Myth**

“All anaphylactic reactions have skin symptoms”

**Food Allergy Fact**

10 to 20% of anaphylactic reactions have no skin symptoms.
Emergency Preparedness Take Home Points

Know how and when to give epinephrine
Always have 2 epinephrine doses available
Call 911 for Anaphylaxis

Food Allergy Management must be Implemented in all Settings

Home
School
Restaurants

Parties and Play Dates
Alternative Care Givers
Use Resources

Learning Objectives

• Definition & Epidemiology
• Physical Examination & Clinical History
• Diagnostic Testing
• Food Allergy Management
  – Epinephrine
  – Education
• Referral to an Allergist
Involve a Board Certified Allergist

- Develop a collaborative relationship with a board certified allergist comfortable managing pediatric food allergy

- Refer to and involve a board certified allergist early on (NIAID 6.4.2.5)

- Contact a board certified allergist while waiting for consultation when needed

Learning Objectives

- Definition & Epidemiology
- Clinical History
- Diagnostic Testing
- Food Allergy Management
  - Epinephrine
  - Education
- Referral to an Allergist
Resource Links

- **AllergyHome.org**
  - Living Confidently Handbook
    - [www.allergyhome.org/handbook](http://www.allergyhome.org/handbook)
  - Label Reading section
    - [www.allergyhome.org/labels](http://www.allergyhome.org/labels)
  - Cross-contact section
    - [www.allergyhome.org/cross-contact](http://www.allergyhome.org/cross-contact)

- **FoodAllergyThrive.com**
  - Parent Handout
    - [www.ruchigupta.com/FAST_PARENTHANDOUT](http://www.ruchigupta.com/FAST_PARENTHANDOUT)

- **AANMA.org**
  - Allergy & Asthma Network provides a medically-accurate, patient-friendly support network

- **ACAAL.org**
  - American College of Asthma, Allergy & Immunology provides clinical information & an Allergist Locator tool
Resource Links

- **AAP.org**
  - Medical Home Chapter Champions Program on Asthma, Allergy and Anaphylaxis
  - Section on Allergy and Immunology
    - [http://www2.aap.org/sections/allergy/SOAIConsultResources.pdf](http://www2.aap.org/sections/allergy/SOAIConsultResources.pdf)

THANK YOU

Dr. Ruchi Gupta, Dr. John Lee, Dr. Michael Pistiner
### Food Allergy: Epidemiology, Diagnosis and Management in the Medical Home

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<th>Number</th>
<th>Questions</th>
<th>Responses</th>
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<td>1</td>
<td>Re testing: Interaction of environmental with food allergens?</td>
<td>Answered during webinar</td>
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<td>2</td>
<td>Risk of empiric withholding of certain foods since they “may interact” with allergens that were “positive” on testing</td>
<td>Oral allergy syndrome (OAS), also known as pollen-food syndrome, is probably the most common and most under-recognized food allergy in adults. It is a cross-reactivity of pollens with certain foods, usually with fruits and vegetables. The most common association is seen in those with both pollen allergies who experience symptoms when eating fruits from the Rosaceae family, such as apples, peaches, pears, plums and cherries. Cross-reactivity exists between other pollens such as ragweed with bananas or melons, and between grass and certain grains. Symptoms of OAS are typically oral and pharyngeal itching or tingling, that resolves soon after the food is eaten. Because the cross-reactive allergen is heat-sensitive, symptoms may be prevented if the food is cooked, such as in a pie or bread. If peanuts or tree nuts are involved in OAS, heating may not prevent symptoms. Often patients with OAS are not prescribed epinephrine because of the low incidence of anaphylaxis and also because symptoms are typically only oral and pharyngitis related. However, patients are counseled to avoid the food in question in fresh form. In some cases, epinephrine is prescribed, if there are unusual or severe reactions noted, or if peanuts or tree nuts are involved.</td>
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<td>3</td>
<td>Can you discuss oral allergy symptoms patients who report itchy mouth especially with certain foods? How would you manage them? Do they need to have epinephrine?</td>
<td>Answered during webinar</td>
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<td>4</td>
<td>Can you discuss timing of introduction of high risk foods in infants at risk for food allergies?</td>
<td>There does not seem to be strong evidence about a relationship between the timing of the introduction of high-risk allergenic foods and development of atopic disease. There are currently studies looking at the benefits of introducing allergenic foods at an early age. Currently the data is inconclusive. This lack of evidence raises questions about the benefit of delaying the introduction of highly allergic solid foods beyond 4 to 6 months of age.</td>
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<td>5</td>
<td>What can you do in a smaller town for oral challenges if there is no allergist? Do they have to travel hours to get this done? I know some pediatricians and PPs in the past have done prick testing and oral challenges. Not to mention allergy elimination shots.</td>
<td>Answered during webinar</td>
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<td>6</td>
<td>What are the current standards for introduction of foods to infants? Specifically is it still recommended to start 1 food every 3-5 days? And given recent evidence that does NOT support delaying exposure to common food allergens (eggs, wheat, etc) have allergists changed their recommendations regarding delaying these foods?</td>
<td>Answered during webinar</td>
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<td>7</td>
<td>For a rural practice setting, referral to an allergist are nice thoughts but difficult in practice. Several of my patients due not have means to travel to an allergist. While I recognize the need to recommend delaying the introduction of highly allergic solid foods beyond 4 to 6 months of age.</td>
<td>Answered during webinar</td>
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<td>8</td>
<td>Are the sIgE tests as readily available as the RAST testing? Has their been a wide-spread switching of the labs in community labs, or is this mostly a change in academic centers?</td>
<td>RAST testing is a test that uses radio-active labeled probes that is no longer in use by commercial labs. It has been replaced almost entirely by sIgE test which is an enzyme based assay (ELISA). Although many physicians and families still may refer to the tests as “RAST”, the test that is being performed is the sIgE tests.</td>
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<td>9</td>
<td>What would be the anaphylaxis risk for a toddler who has twice vomited shortly after eating scrambled eggs? Should the child be treated?</td>
<td>The history is certainly suspicious for an allergy to egg. It is important to recall that allergic reactions can occur without any cutaneous symptoms. Getting a history would be helpful to rule out other causes. For example you can inquire, if the toddler had been febrile and has diarrhea or other symptoms of an acute gastroenteritis. You should also inquire if the toddler had eaten egg since that time. For example, if he regularly eats hard-boiled eggs then you should look for other causes of his symptoms. If there are no other explanations for the symptoms, I recommend arranging for allergy testing to eggs to be performed. Keep in mind that even if the child is eating baked goods containing eggs, e.g. bread, cakes, or cookies, he or she may still have an egg allergy and have a reaction if eating uncooked or whole forms of egg. If the child is eating baked products containing egg, he or she may be able to continue having it in their diet, but should be counseled about how to do this safely.</td>
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<td>10</td>
<td>Any advice for teenagers with life threatening food allergies who are so anxious they avoid many activities and new foods? We can’t give epinephrine every time there is anxiety because it is not a real reaction 90.999999% of time but somatic anxiety reaction.</td>
<td>A major focus will be educating the teenager and their family about practical food allergy management strategies that are effective without being overly restrictive. There are many potential misperceptions about food allergies that can cause unnecessary fear and restriction. It is helpful to ask the teen and their family what their understanding of what is and what isn’t risk is. This will help establish a baseline. Early on, involve a board certified allergist and consider involving behavioral health. Behavioral health will be especially important if anxiousness goes beyond just food allergy and if worried thoughts do not improve once the family is appropriately educated (re-educated).</td>
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<td>11</td>
<td>If a child has anaphylaxis to milk or egg - is there chance of growing out of it still the same?</td>
<td>Answered during webinar</td>
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<td>12</td>
<td>What if you are unsure a child has ingested the food they are anaphylactic too - but are suspicious? At what point do you suggest to give the EpiPen?</td>
<td>This question gets at a few important points. A logical and understandable Food Allergy and Anaphylaxis Emergency Care Plan (ECP) that treats anaphylaxis with epinephrine is essential. Along with these plans, education will need to be included for families and patients (in a developmentally appropriate way) about allergic reactions, anaphylaxis, treatment with epinephrine and calling 911 for ambulance transport to the emergency department. When filling out these ECPs, there is some potential variability that will vary with provider, the individual child, as well as the parents and secondary caregivers. Ideally if care givers are able to use judgment, has a good handle on the potential allergen exposure, and are capable of symptom recognition, then they may be able to get more information in regards to their suspicion of exposure while the child has no symptoms. There are some providers who will suggest that if a known allergen was consumed, then treating with epinephrine will be included in their plan even if no symptoms are present. Other’s will recommend waiting for the onset of any symptom, while still others may delineate waiting for symptoms that suggest anaphylaxis. Whatever the ultimate decision is in creating an ECP, hammer home that if there is any doubt, then airing on the side of caution and treating with epinephrine is the way to go.</td>
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<td>13</td>
<td>At which age do you consider introducing egg and nuts? 12m or 15m? or even as young as 6m?</td>
<td>Although, solid foods should not be introduced before 4 to 6 months, there is no current convincing evidence that delaying their introduction beyond this period has a significant protective effect on the development of atopic disease. Solid foods are often delayed because of the risk of choking. Currently no recommendations exist for delaying eggs or soft nuts like peanut butter to a later time.</td>
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<td>14</td>
<td>For school allergy action plans- some give a choice of benadryl if allergen exposure but no symptoms, do you instead recommend epinephrine?</td>
<td>Take a look at question #12 and response as far as treating a potential exposure with epinephrine. Again, there is some variability in practice when creating an effective emergency care plan. Remember that antihistamines do not treat or prevent anaphylaxis. Delays in administering epinephrine are associated with increased mortality. Often times, the decision whether or not to treat with epinephrine will depend on what symptoms are present. Antihistamines help with skin and mucosal symptoms. Antihistamines, especially first generation antihistamines like diphenhydramine, can cause drowsiness and make it difficult to assess mental status. Also, keep in mind that in some states and schools antihistamines may not be allowed to be given by anyone other than the school nurse. While some providers include antihistamines on ECPs other do not.</td>
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